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Patient as a Subject of the Care of the Therapeutic Team

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Cover Illustration: Synthetic route and the structure of N-3-(1,2,4-dithiazole-5-thione)-β-resorcylcarbothioamide (DTRTA) (Niewiadomy A, Krajewska-Kułak E, Łukaszuk C, Matysiak J, Kostecka M, Roczniki Akademii Medycznej w Białymstoku, 2005; 50, Suppl 1: 31-5).

Pharmacokinetic interactions of carbamazepine with some antiepileptic drugs during epilepsy treatment in children and adolescents

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Abstract

Purpose: **The aim of the study was to obtain pharmacokinetic data for carbamazepine (CBZ) and its fractions not bound with proteins in bitherapy with lamotrigine (LTG), topiramate (TPM), vigabatrin (VGB) or valproic acid (VPA) in children and adolescents treated for epilepsy.**

Material and methods: **The participants of the presented investigations were fifty-five patients with epilepsy who were under control of The Department of Developmental Neurology, University of Medical Sciences in Poznań. All of patients were treated with CBZ in bitherapy with LTG, TPM, VGB or VPA. The blood samples were taken under steady-state conditions, before the morning dose and subsequently every 3 or 2 for 24 h. The plasma levels of CBZ were determined using TDX analyzer (Abbott Diagnostic Division, USA). Free CBZ fraction was isolated with the use of ultrafiltration system (Amicon, USA). For pharmacokinetic calculations of total and free CBZ, one-compartment model was used according to standardized procedure.**

Results: **No significant differences in pharmacokinetic parameters of unbound CBZ in four groups of patients on bitherapy with CBZ and LTG, TPM, VGB or VPA were found. The changes in pharmacokinetics of total CBZ were related with difference in CBZ concentrations, area under curve (AUC), L/D/kg ratios and clearance (Cl)/kg. CBZ+VGB bitherapy led to higher total CBZ concentrations. In the group on bitherapy with CBZ+VPA, no increase in unbound CBZ was detected.**

Conclusions: **Pharmacokinetic interactions of CBZ with LTG, TPM, VGB or VPA in children are associated only with the changes in total CBZ parameters.**

Key words: carbamazepine, interactions, lamotrigine, topiramate, vigabatrin, valproic acid.

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Introduction

Treatment of epilepsy in most of children involves long-term therapy with one or more of antiepileptic drugs (AEDs). Interactions between AEDs can results from either pharmacodynamic or pharmacokinetic mechanisms [1]. Pharmacodynamic interactions between drugs with similar or opposing pharmacological mechanism of actions take place at the cellular levels (cellular targets) and are associated with no changes in the plasma levels of these drugs. Pharmacokinetic interactions can occur when one drug interferes with another one and alters the level of the drug or its metabolite or both of them [1,2]. This kind of interactions between AEDs most commonly occurs due to displacement of a drug from binding with plasma proteins or modification of hepatic metabolism. Interactions involving protein binding displacement are prominent only among the highly protein-bound AEDs (more than 90%), i.e. phenytoin (PHT), tiagabine (TGB) or valproic acid (VPA) [1,2,3]. For drugs with low intrinsic hepatic clearance (Cl), like AEDs, the addition of displacing agent causes a decrease in the total drug concentration in plasma and no changes of free drug concentrations. As concentration of unbound fraction represents the pharmacologically active drug, the clinical effects of AED should also be unchanged. Clinically important interactions involving hepatic metabolism occur when a drug reduces (enzyme inhibition) or enhances (enzyme induction) the activity of pathways responsible for the metabolism of co-administered drugs. The magnitude of both inhibition or induction and their clinical relevance depend on age of children, genetic and envi-

Table 1. **The age of patients treated with CBZ and other AEDs**

Bitherapy	Number of patients	Age range (years)	Mean age ±SD	Sex M/F
CBZ+VPA	28	6.3 - 18.2	13.6 ± 2.9	14/14
CBZ+LTG	10	11.6 - 17.8	15.5 ± 1.9	3/7
CBZ+TPM	11	9.9 - 17.1	13.9 ± 3.5	5/6
CBZ+VGB	6	11.4 - 17.6	15.9 ± 4.4	2/4

ronmental influences, doses and pharmacological activity of the metabolites [1,4,5].

Classic AEDs are often involved in many interactions due to their pharmacokinetic properties. These drugs carbamazepine (CBZ), PHT, phenobarital (PB), primidone (PRM) are potent inducers of cytochrome P 450 (CYP450) and can enhance the metabolism of other AEDs lamotrigine (LTG), topiramate (TPM), and TGB [1,6]. VPA inhibits the metabolism of PB, LTG and CBZ and increases a risk of toxicity of these drugs. VPA is a protein-binding displacer.

The new AEDs exhibit fewer potential interactions than the classic AEDs. They are eliminated by the renal system and are not protein-bound (except TGB). Oxcarbazepine (OXC), felbamate (FBM) and TPM have mild inducing properties and may cause CYP2C19 inhibition thus the metabolism of PHT may be altered. Gabapentin (GBP), vigabatrin (VGB), and leviteracetam (LEV) exhibit few or no interaction with AEDs. FBM, LTG, TGB, TPM and zonisamide (ZNS) may be induced by classic AEDs with enzyme-inducting properties.

CBZ is widely used in the treatment of partial and generalized seizures. Polytherapy of CBZ with conventional AEDs like: PHT, PB or PRM is related with decreased plasma levels of CBZ [7] but some authors did not observe any changes in CBZ level [8]. The main effect of these interactions is an increase in carbamazepine-10,11-epoxide (CBZ-E) level due to induction of CYP3A4 [7]. PHT levels during bitherapy with CBZ may increase or decrease [9]. CBZ may inhibit or induce PHT biotransformation [10]. The decrease in PRM and increase its active metabolite – PB were noticed during bitherapy with CBZ+PRM [9]. CBZ+PB bitherapy was little clinical value because the increase in CBZ level is small and CBZ does not influence PB concentration [7,9].

Co-medication with CBZ+VPA leads to both pharmacodynamic and pharmacokinetic effects. Pharmacodynamic, synergistic interaction results in enhanced antiepileptic efficacy of this combination [11,12]. Protein binding of CBZ is changed during bitherapy with VPA and the unbound fraction of CBZ can increase [13]. Some authors did not observe these changes [7] or found only temporary increase in free CBZ level [14]. VPA inhibits the metabolism of CBZ-E and toxic plasma concentrations of CBZ-E may be observed [7,15]. Bernus et al. [16] described the inhibition of glucuronidation of CBZ-10, 11-trans-diol, and probably inhibition of the conversion CBZ-E to trans-diol derivative, rather than simple inhibition of epoxide hydrolase.

CBZ+LTG bitherapy is related with shortening in t½ of LTG and neurotoxic side effects [9]. The mechanism of these changes is unknown [9]. The ratio CBZ/CBZ-E concentration is lowered during co-medication with LTG [8]. The data about concentrations of these drugs during bitherapy are divergent [9]. The pharmacodynamic interaction may result in neurotoxic symptoms [1,17]. CBZ-E is pharmacologically active metabolite of CBZ but some authors do not agree with opinion about its role in epilepsy treatment and side effects [8,18]. Winnicka et al. [19] did not observe relationship between side effects and increase in CBZ plasma levels.

The effect of VGB therapy on CBZ concentration is somehow controversial. Some studies did not show any influence on CBZ levels [9]. However, Jędrzejczak et al. [20] reported an increase in CBZ concentration after VGB addition. Sanchez-Alcaraz et al. [21] reported also an increase in CBZ clearance during its bitherapy with VGB.

Sisodiya et al. [22] described some patients with neurotoxic side effects after combining LEV with CBZ without any changes in concentrations of both AEDs and CBZ-E. TPM is a weak inducer of isoenzymes of CYP450 and its addition to CBZ does not change pharmacokinetic parameters of total an unbound CBZ [23,24]. Pharmacokinetics of CBZ did not change during treatment with TGB but t½ and Cl of TGB increased when this combination was used due to the same metabolic pathway (CYP3A4) [25]. Addition of OXC to CBZ therapy can lead to small decrease in serum CBZ concentration [26,27].

The aim of the study was to obtain pharmacokinetic data for CBZ and its fractions not bound with proteins in bitherapy with LTG, TPM, VGB or VPA in children and adolescents treated for epilepsy.

Material and methods

The participants of the study were fifty-five patients with epilepsy who were under care of The Department of Developmental Neurology, K. Marcinkowski University of Medical Sciences in Poznań. All patients were treated with CBZ in bitherapy with LTG, TPM, VGB or VPA. The age of patients and AEDs doses are presented in *Tab. 1* and *2*. One-way analysis of variance showed statistically significant differences mean age of patients ($p<0.001$, $F=5.038$, $df=7:136$). Post hoc Tukey tests did not show any differences.

One-way analysis of variance showed statistically significant difference in CBZ doses ($p=0.01$, $F=2.272$, $df=7:136$) but in *post-hoc* tests found no differences in CBZ doses.

Twelve patients had primary generalized epilepsy and 43 patients suffered from focal seizures. The blood samples were taken under steady-state conditions before the morning dose and subsequently every 3 or 2 h for 24 h. The last changes in

Table 2. **Doses of CBZ and other AEDs**

Bitherapy	CBZ dose range mg/kg	Mean CBZ dose mg/kg	Dose range of co-administered AEDs mg/kg	Mean doses of co-administered AEDs mg/kg
CBZ+VPA	5.0 - 22.2	14.4 ± 7.6	4.5 - 40.0	20.7 ± 8.1
CBZ+LTG	4.8 - 17.9	10.6 ± 4.3	1.9 - 7.0	3.5 ± 1.8
CBZ+TPM	5.8 - 22.0	12.7 ± 5.3	3.3 - 12.1	5.9 ± 2.7
CBZ+VGB	9.6 - 21.4	13.3 ± 4.4	17.5 - 72.0	38.4 ± 18.2

Table 3. **Pharmacokinetic parameters of unbound CBZ in patients on bitherapy with other AEDs**

Parameter	CBZ+LTG	CBZ+TPM	CBZ+VGB	CBZ+VPA	Analysis of variance		
					Df	F	p
AUC [μgh/ml]	18.10 ± 5.98	22.13 ± 7.82	20.98 ± 7.25	19.26 ± 7.87	3;54	0.623	0.603
t½ [h]	24.36 ± 14.87	18.85 ± 9.58	18.42 ± 4.53	22.08 ± 15.17	3;54	0.341	0.796
k [1/h]	0.05 ± 0.03	0.05 ± 0.03	0.04 ± 0.01	0.05 ± 0.03	3;54	0.415	0.743
Cl/kg [ml/h/kg]	292.94 ± 97.22	318.07 ± 148.89	323.51 ± 55.95	379.06 ± 202.89	3;54	0.834	0.481
Vd/kg [l/kg]	11.45 ± 9.75	8.35 ± 4.65	8.61 ± 2.14	12.31 ± 10.85	3;54	0.645	0.590
C_{min} [μg/ml]	1.28 ± 0.37	1.60 ± 0.58	1.52 ± 0.53	1.44 ± 0.64	3;54	0.57	0.683
C_{mean} [μg/ml]	1.49 ± 0.49	1.82 ± 0.65	1.73 ± 0.60	1.71 ± 0.70	3;54	0.46	0.688
C_{max} [μg/ml]	1.77 ± 0.70	2.14 ± 0.77	2.04 ± 0.78	1.99 ± 0.77	3;54	0.423	0.737
FI	0.38 ± 0.23	0.35 ± 0.16	0.34 ± 0.12	0.46 ± 0.43	3;54	0.484	0.695
L/D/kg [μg/ml/mg/kg]	0.15 ± 0.05	0.18 ± 0.13	0.13 ± 0.02	0.14 ± 0.07	3;54	0.683	0.567

Table 4. **Pharmacokinetic parameters of total CBZ in patients on bitherapy with other AEDs**

Parameter	CBZ+LTG	CBZ+TPM	CBZ+VGB	CBZ+VPA	Analysis of variance		
					Df	F	p
AUC [μgh/ml]	117.02 ± 51.46	87.39 ± 21.76	128.30 ± 19.95	77.31 ± 23.47	3;54	7.650	0.0001*
t½ [h]	17.55 ± 8.09	25.16 ± 8.17	13.96 ± 7.50	17.39 ± 1.07	3;54	0.209	0.890
k [1/h]	0.06 ± 0.03	0.06 ± 0.04	0.06 ± 0.02	0.06 ± 0.04	3;54	0.913	0.439
Cl/kg [ml/h/kg]	47.59 ± 14.12	75.22 ± 29.91	53.21 ± 17.75	88.63 ± 41.93	3;54	4.424	0.008*
Vd/kg [l/kg]	1.13 ± 0.53	2.85 ± 3.66	1.15 ± 0.87	2.06 ± 1.28	3;54	1.821	0.155
C_{min} [μg/ml]	7.81 ± 3.59	6.07 ± 1.80	8.52 ± 1.08	5.68 ± 2.12	3;54	3.842	0.015*
C_{mean} [μg/ml]	9.59 ± 4.24	7.20 ± 1.84	10.52 ± 1.60	6.92 ± 2.51	3,54	4.582	0.006*
C_{max} [μg/ml]	11.37 ± 4.78	8.38 ± 1.98	12.70 ± 2.21	8.26 ± 3.07	3;54	4.913	0.004*
FI	0.49 ± 0.27	0.42 ± 0.23	0.48 ± 0.15	0.50 ± 0.30	3;54	0.222	0.880
L/D/kg [μg/ml/mg/kg]	0.95 ± 0.41	0.67 ± 0.35	0.86 ± 0.30	0.54 ± 0.20	3;54	5.846	0.002*

* Difference statistically significant at $p \leq 0.05$

dosage were done two months before the study. The plasma levels of CBZ were determined using TDX analyzer (Abbott Diagnostic Division, USA). Free CBZ fraction was isolated with the use of ultrafiltration system (Amicon, USA). Diurnal fluctuations of free and total CBZ were presented with the use of fluctuation index (FI), i.e. the difference between maximum concentration (C_{max}) and minimum concentration (C_{min}), which is the percentage of C_{min} ($FI = C_{max} - C_{min} / C_{min}\%$). For pharmacokinetic calculations of total and free CBZ, one-compartment model was used according to standardized procedure. Pharmacokinetic parameters: area under curve (AUC), elimination rate constant (k), half-life (t½), volume of distribution (Vd), Cl, level/dose (L/D) ratio and free fraction (FF) (AUC free/AUC total ratio) were compared using analysis of variance and *post-hoc* test (Tukey test, $p = < 0.05$).

Results

Pharmacokinetic parameters for unbound CBZ in bitherapy and results of analysis of variance were presented in *Tab. 3*. CBZ achieved after the doses used in all patients were in therapeutic range (1.1 do 3.2 μg/ml) [28]. The unbound CBZ levels were below therapeutic concentrations only in some cases, but the C_{mean} values were always in therapeutic range. Pharmacokinetic parameters calculated for unbound CBZ in four groups of patients did not differ significantly.

Pharmacokinetic parameters for total CBZ in bitherapy are presented in *Tab. 4*.

Mean values of C_{min}, C_{max} and C_{mean} of total CBZ used with TPM or VPA were in therapeutic range, 4-10 μg/ml [28]. The values above 10 μg/ml and below 4 μg/ml were measured only

in few cases in the groups on CBZ+VPA and CBZ+LTG bitherapy. In a case of bitherapy with CBZ+LTG, the C_{max} of total CBZ was higher than therapeutic value averaging 11.37±4.78 μg/ml. The C_{max} values of C_{min}, C_{max} and C_{mean} were the highest in CBZ+VGB bitherapy group. Two of them, maximum and mean levels of CBZ, were the highest among observed groups of bitherapy (*Tab. 4*).

C_{min} was the lowest in groups on CBZ+VPA bitherapy while in the patients on CBZ+VGB bitherapy it was the highest. C_{min} for CBZ+LTG and CBZ+TPM did not differ from the others C_{min} values.

Analysis of variance for C_{mean} showed the difference between all patient groups. The lowest C_{mean} resulted from CBZ+VPA treatment and differed from the highest C_{mean} in CBZ+VGB group. However, these values did not differ from C_{mean} in CBZ+TPM or CBZ+LTG groups. Total CBZ concentration in the group treated with CBZ+TPM was different from that in CBZ+VGB bitherapy while the result of CBZ+LTG treatment did not differ from the co-medication with VGB and VPA.

C_{max} of CBZ varied in different treatment, it was the highest in CBZ+VGB group. This value differed from C_{max} of CBZ during co-medication with CBZ and VPA or TPM. CBZ C_{max} was not changed by LTG and VGB co-medication. The lowest levels of CBZ were measured in CBZ+VPA – treated group and were different from C_{max} in patients on bitherapy with VGB+CBZ.

The value for bitherapy CBZ+LTG was the highest and differed from values those for CBZ+VPA – treated group. L/D/kg for bitherapy with CBZ and VGB or TPM did not differ.

The CBZ AUC was the highest in patients on bitherapy with CBZ+VGB and the smallest in those receiving bitherapy with CBZ+VPA. AUC of CBZ+TPM – treated group differed from the value in patients receiving CBZ+VGB. There was no difference in AUC values between VPA versus TPM co-medication with CBZ, and TPM vs LTG as well as LTG vs VGB.

Cl of CBZ significantly differed between the groups. The highest values of Cl were calculated for CBZ+VPA group and the lowest Cl of CBZ accompanied add-on therapy with LTG. Vd did not differ statistically significantly in all patient groups as demonstrated by analysis of variance and *post-hoc* tests.

Analysis of variance revealed statistically significant ($p=0.018$) differences in FF between all groups of patients. There were no differences between the groups on bitherapies. The highest values of FF were calculated for CBZ+TPM (0.25±0.07 μg/ml) and CBZ+VPA (0.25±0.09 μg/ml) groups and the lowest for CBZ+VGB (0.17±0.06 μg/ml) and CBZ+LTG (0.17±0.06 μg/ml) treated groups (data are not shown).

Discussion

Epilepsy treatment with CBZ is related with an autoinduction. The autoinduction of CBZ leads to a decrease in CBZ levels and shortening of t½ [28,29]. Metabolism of CBZ accelerates during treatment and the doses of this drug may be too low to achieve the therapeutic effect [29,30]. Cl values may increase two times after one month of treatment but no changes were observed after four months [26]. Cloyd and Remmel [31] reported cases with three times higher Cl in initial weeks of CBZ therapy. The range of autoinduction depends on CBZ dose. The increase in CBZ dose does not elevate plasma CBZ concentration at the beginning of treatment [28].

The fluctuations of concentration of total and unbound CBZ were found in therapeutic range in the patients participating in this study. No differences in pharmacokinetic parameters of unbound CBZ between all groups on bitherapies: CBZ+LTG, CBZ+TPM, CBZ+VGB and CBZ+VPA were found. The changes in pharmacokinetic parameters of total and unbound CBZ in each of bitherapy groups are discussed below.

CBZ+LTG

No differences of unbound CBZ were observed between all groups. The lowest concentrations of CBZ were probably related with the smallest doses of CBZ used in add-on therapy with LTG, however, no differences were calculated in CBZ doses. In the earlier reports on interaction CBZ+LTG, the authors suggested an increase in CBZ-E level [32], but later observations did not confirm this conclusion [1,17]. Eriksson et al. [33] described no changes in CBZ and CBZ-E concentrations after LTG addition. This study and observations of others authors [34] excluded any pharmacokinetic interaction between CBZ and LTG. CBZ+LTG bitherapy leads to pharmacodynamic interaction with a possibility of neurotoxic side-effects [17,35].

The doses of CBZ used in patients receiving CBZ+LTG were lower than the doses in those treated with CBZ+VPA but without significant differences. Usually, in co-medication with CBZ and VPA, the lower concentrations of CBZ were estimated [36].

No changes in Cl were observed in comparison with CBZ+TPM and CBZ+VGB groups. The lower values of Cl in CBZ+LTG bitherapy group might be related with lower doses of CBZ used with LTG.

The interactions of AEDs during absorption are very rare [2]. LTG does not change the absorption or elimination of CBZ. It was demonstrated by double-blind, randomized study in volunteers presented by Malminiemi et al. [37]. Protein-binding interactions commonly occur when two highly protein-bound drugs (>90%) are co-administered and compete for a limited number of binding sites. Bitherapy with CBZ+LTG does not change pharmacokinetic parameters of both CBZ and its active metabolite CBZ-E. LTG is a weak inducer of UGT while CBZ induces both CYP450 isoenzymes and UGT, so the interaction between these two AEDs may appear [4,38]. LTG is metabolized via conjugation with UGT and it neither influences nor inhibits CYP450 isoenzymes. CBZ is metabolized by CYP450 system and induces P450 isoenzymes, which do not metabolize LTG [2]. No change was observed in pharmacokinetics of free CBZ fraction in CBZ+LTG group comparing with other groups. Finally, no interactions during elimination were reported [2], and LTG did not influence elimination of CBZ [37].

CBZ+TPM

Co-medication with both of these two drugs was used for the treatment of epileptic patients with simple or complex focal/partial seizures. However, the indications of TPM usage

are broader, since they were applied to manage, a lot of epileptic seizures and epileptic syndromes [39] and status epilepticus [40]. Mean doses of TPM and CBZ were in therapeutic range. There were no significant differences in CBZ doses between all bitherapy groups.

Some changes in pharmacokinetic parameters of unbound and total CBZ were observed in the group CBZ+TPM. No reports were found about parallel comparison of four groups of patients treated with CBZ in combination with different AEDs. Co-medication with CBZ and VGB, VPA, LTG or TPM did not lead to any changes in pharmacokinetic parameters of unbound CBZ. Sachdeo et al. [23] reported no influence of TPM addition on pharmacokinetics of total and free CBZ and CBZ-E. Neurotoxic side effects connected with CBZ appeared when TPM was used as add-on therapy with CBZ. Reduction of CBZ dosage resulted in a disappearance of these symptoms [41]. Maximum and mean CBZ concentrations and AUC did not differ from the respective value obtained in CBZ+VGB bitherapy group.

CBZ+VGB

Fluctuation of pharmacokinetic parameters in CBZ+VGB were analyzed only in six patients. The small number of patients was connected with some limitation of the use of VGB to few epileptic syndromes. West syndrome (WS) was the special indication to use VGB [42]. Apart from this indication, VGB is often used in the treatment pharmacoresistant focal seizures [25]. The limitation of VGB therapy is related with some unwanted effects, especially with appearance of visual defects in 30% of patients treated with VGB [43].

Combination of CBZ with VGB is very effective due to specific mechanism of action of these two AEDs. Combining a sodium channel blocker with drug enhancing GABAergic inhibition may be useful in patients with generalized tonic-clonic seizures and partial seizures [11]. Bitherapy with VGB did not cause any differences in pharmacokinetic parameters of unbound CBZ. During treatment with CBZ+VGB, we can expect higher concentration of CBZ than during other bitherapies with CBZ. Similar conclusions were drawn by Jędrzejczak et al. [20]. The authors noticed 10% increase in CBZ concentration after addition of VGB to CBZ therapy. A negative correlation between the increase and the initial level of CBZ prior to VGB addition was found. However, the trial of these authors comprised only adult patients, and they did not measure unbound CBZ levels. Neurotoxic symptoms of CBZ in bitherapy with VGB have been reported sometimes, but without any pharmacokinetic consequences [9,45,46].

Searching for any pharmacokinetic interactions between CBZ and VGB, Sanchez-Alcaraz et al. [21] investigated pharmacokinetics of CBZ during monotherapy and after addition of VGB. Co-medication with VGB and CBZ was connected with a decrease in L/D ratio and with an increase in Cl by about 35%. Furthermore, the plasma levels of CBZ in some patients lowered to subtherapeutic values. The monitoring of CBZ concentration after addition VGB is important for this type of bitherapy. The explanation of interaction of CBZ with VGB is difficult. VGB is not metabolized in the liver, does not bind to plasma proteins and the major route for its elimination is *via* renal excretion of the unchanged compound [1]. The reports about VGB interaction are ambigous [20,21]. The reason of this discrepancy in the observations may be different time of blood sampling and the fact that CBZ concentrations were measured before autoinduction period [29].

CBZ+VPA

Bitherapy with CBZ and VPA is the combination of AEDs which was used most often in the patients participating in the present study. CBZ doses did not differ from other groups in this study.

CBZ is used in the treatment of partial epilepsy more often than VPA but VPA was not more effective in generalized tonic-clonic seizures [47]. Combination of these AEDs has been used for treatment of epileptic seizures for many years [12]. There were no serious side-effects. Some authors underline not only pharmacokinetic but pharmacodynamic interactions that increase antiepileptic properties of these AEDs [48]. Deckers et al. [11] reported that combination of CBZ+VPA appeared to be associated with an improvement in effectiveness. Froscher [49] mentioned bitherapy CBZ with VPA as very useful in drug-resistant seizures.

VPA is highly bound to plasma proteins. VPA can displace drugs from their plasma protein-binding sites and their free fraction may dramatically increase [7]. Despite VPA capability of increasing unbound CBZ levels, no changes in free CBZ levels were obtained. Literature data indicate that sometimes unbound CBZ concentrations remained unchanged [50] and this interaction is doubtful [51]. Kozik et al. [14] reported an increase in unbound CBZ level during bitherapy with VPA at the beginning of treatment with CBZ+VPA and, then, a decrease in the concentrations to the values before bitherapy. The lack of high unbound CBZ levels in CBZ+VPA bitherapy, patients even considering mechanism of displacement of other drugs by VPA, may be explained by the fact that the study was conducted after stabilizing of concentrations all AEDs. This interaction has small clinical significance and it does not increase unbound CBZ levels.

The changes in CBZ levels have been described as decreased [52], increased or cure changed by VPA [51,53]. The L/D/kg ratio was the lowest and differed from L/D/kg ratio calculated for CBZ+LTG. These values usually decrease in polytherapy [52,54]. The lowest L/D/kg for CBZ+VPA, despite similar CBZ doses, are connected with low concentrations of CBZ in bitherapy with VPA. Liu and Delgado [52] explained this phenomenon as increases in CBZ Cl due to heteroinduction of CBZ while in patients treated with CBZ+VPA as an increase in unbound CBZ. CBZ Cl in the group was the highest and differed from Cl in patients on CBZ+LTG bitherapy. The changes in this parameter were observed also during treatment with other AEDs [46]. The interaction between CBZ and VPA was described as very complicated due to various values of total CBZ concentrations but the final effect depended on the examined population [54]. The lack of any influence of VPA on CBZ levels was explained as an effect of unchanged activity of CYP3A4 isozyme by VPA [2]. Because of inhibition of epoxide hydrolase, VPA can significantly inhibit Cl of CBZ-E [51]. Although the measured CBZ concentrations remain stable, toxicity may still occur. CBZ-E is an active metabolite of CBZ and, despite its antiepileptic activ-

ity, is responsible for side-effects [18]. Newer study does not confirm these results but reports that side-effects may be connected with high CBZ levels [19]. Bernus et al. [16] described the inhibition of glucoronidation of CBZ-10, 11-trans-diol, and probably inhibition of the conversion CBZ-E to trans-diol derivative, rather than simply inhibiting epoxide hydrolase.

Conclusions

There were no significant differences in pharmacokinetic parameters of unbound CBZ between four groups of patients on bitherapy with CBZ and LTG, TPM, VGB or VPA. The changes in pharmacokinetics of total CBZ were related with differences in CBZ concentrations, AUC, L/D/kg ratios and Cl/kg. In the group CBZ+VPA, no increase in unbound CBZ was detected. CBZ+VGB bitherapy may lead to higher total CBZ concentrations than other types of bitherapy.

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Variations of enzymatic activity and biotypes of the yeast like fungi strains isolated from cancer patients

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Abstract

Purpose: Determination of the enzymatic activity and enzymatic biotypes variations of the yeast like fungi strains isolated from cancer patients with oral candidiasis during last 5 years.

Material and methods: We evaluated enzymatic activity of 92 *Candida albicans* strains isolated from oral ontocenosis from cancer patients with candidiasis symptoms in 1999 and 2003. The enzymatic activity of the strains tested was assessed by the API ZYM (bioMerieux) method. Biotypes of the strains were determined according to Williamson's or Kurnatowska's and Kurnatowski's classifications.

Results: In 1999 *Candida albicans* 17 of 19 tested isolates had hydrolytic activity hydrolases and 87% of strains were assigned according to Wiliamson's. Only 8.7% of strains were classified according to Kurnatowska's and Kurnatowski's, but 4.3% strains according to Krajewska-Kułak et al. In 2003, 18 of 19 strains had hydrolytic activity and 93.5% of strains were classified according to Wiliamson's, but 4.3% according to Kurnatowska's and Kurnatowski's and 2.2% according to Krajewska-Kułak et al.

Conclusions: The results of present study indicate that most of tested strains were classified into Wiliamson's system. Our findings suggest that other Candida biotypes should be determined according to their different enzymatic activity and susceptibilities.

Key words: Candida albicans, API ZYM, biotypes.

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Introduction

Among the factors known to contribute to the pathogenicity of yeast, enzymes play a significant role, possibly being harmful to host tissues when they are liberated by the fungi. A correlation has been demonstrated between the amount of phospholipase produced and the virulence in *Candida albicans* strains and other yeast species [1,2]. There are still comparatively few data in the literature on the pathogenicity of yeast like fungi hydrolytic enzymes in women with Candida vaginitis.

Certain fungi such as: Mucor, Rhizopus, Aspergillus, Penicillium and Candida have the ability to release into the environment hydrolytic enzymes, which break down multimolecular compounds – polysaccharides, proteins, lipids, hydrocarbons [1,3]. Hydrolytic enzymes which break down cellulose are produced by some fungi pathological for humans and higher plants [1,4].

According to the Nomenclature Committee of The International Union of Biochemistry and Molecular Biology: the following enzyme nomenclature [1992] is valid: 1) esterases – hydrolase esters of the carboxyl group – lipase and phospholipase A2, hydrolases monoester phosphoric acid – alkaline phosphatase and acid hydrolases ester sulphuric – sulphatase; 2) glucosidases – α-glucosidase, β-glucosidase, α-mannosidase, N-acetyl-β-glucosaminidase; 3) peptidases – aminopeptidases, arylamidases, proteinases, elastases, collagenases, keratinases; 4) ureases [5,6].

Some enzymes in the pathological fungi *Candida albicans*, Candida inconspicua, Rhodotorula mulcilaginosa, Geotrichum candidum can be detected by the cytochemical method [1]. The activity of acid and alkaline phosphatase, adensine triphosphatase and lactate, succinate and 6-phosphoglycolysis dehydrogenase [1]. During the 1980s, a large number of typing methods for the strain differentiation of *Candida albicans* were described in the literature. Although these methods are based on a variety of physiological and genetic markers, none is ideal. Available typing methods for *Candida albicans* include serotyping, morphotyping, resistotyping, biotyping and killer

Table 1. **Hydrolytic enzymes and their substates assayed using API ZYM test**

No	Enzyme assayed	Substrate
E1	Phosphatase alkaline	2-naphtylophosphate
E2	Esterase (C4)	2-naphtylbutyrate
E3	Esterase lipase (C8)	2-naphtylcapylate
E4	Lipase (C14)	2-naphtylmyristate
E5	Leucine arylamidase	L-leucyl-2-naphthylamide
E6	Valine arylamidase	L-leucyl-2-naphtylamide
E7	Cystine arylamidase	L-cystyl-2-naphthylamide
E8	Trypisn	N-benzoyl-DL-arrginine-2-naphthylamide
E9	Chymotripsin	N-glutaryl-phenylalanine-2-naphthylamide
E10	Phosphatase acid	2-naphthylphosphate
E11	Naphtol-AS-BI-phosphohydrolase	Naphthyl-AS-BI-phosphate
E12	α-galactosidase	6-Br2-naphthyl-αD-galactopyranoside
E13	β-galactosidase	2-naphthyl-βD-galactopyranoside
E14	β-glucuronidase	Naphthol-AS-BI-βD-glucuronide
E15	α-glucosidase	2-naphthylyl-αD-glucopyranoside
E16	β-glucosidase	6-Br-2-naphthyl-βD-glukopyranoside
E17	N-acetyl-β-glucosaminidase	1-naphthyl-N-acetylo-βD-glucosaminide
E18	α-mannosidase	6-Br-2-naphthyl-αD-mannopyranoside
E19	α-fucosidase	2-naphthyl-α-L-fukopiranoza

yeast typing. Electrophoretic methods include immunoblotting, isoenzyme analysis, analysis of DNA restriction fragment length polymorphism, karyotyping and the use of DNA probes. The application of these methods to epidemiological research the investigation of outbreaks of disease, and the study of virulence is described. The potential impact of the phenomenon of phenotypic switching on the reproducibility of these typing methods is discussed. It is concluded that many of that several have only a poor discriminatory power or reproducibility [7-11].

API ZYM (bioMerieux) by the use of standard test is possible to determine various species of fungi from ontocenosis in various organs characteristic for their enzymograms.

Aim of the study was determination of the enzymatic activity and enzymatic biotypes variations of the yeast like fungi strains isolated from cancer patients with oral candidiasis during 5 years.

Material and methods

The present study was carried out on 92 *Candida albicans* strains isolated from oral ontocenosis of cancer patients with candidiasis symptoms treated with cytostatics since several months to years in 1999 and 2003. Biotypes were assessed according to Williamson's or Kurnatowska's and Kurnatowski's classifications.

The enzymatic activity of the strains tested was assessed by the API ZYM (bioMerieux) method. We used the 5 degree Mc Farland scale to assess the 24 hour incubation with density suspension for *Candida albicans* strains. Test API ZYM is a semiquantitative method of determining the activity on micro scale. The API ZYM stripes consist of 20 microprobes which enable contact between enzymes and non-soluble substrates (*Tab. 1*). The stripes with microprobes are placed in special chambers filled with water (so-called moist chambers). The results were read according to the instructions provided by the producer. The activity of the enzymes was expressed in nanomols of hydrolysed substrate – according to the intensity of the color reaction on a 5 step scale: 0 – no reaction, 1–5 nanomols, 2–10 nanomols, 3–20 nanomols, 4–30 nanomols, 5–40 nanomols and more.

Biotyping of the Candida strains was done according to Williamson's classification (1986) [1,12]. He described 8 biotypes (from A to H) based on analysis of the activity of 5 selected hydrolases: esterase, valine arylamine, naphtol-AS-BI-phosphohydrolase, α-glucosidases and N-acetyl-β-glucosaminidase [1]. The classification of Kurnatowska and Kurnatowski described 6 biotypes [J to N] but additional biotypes described [1] Krajewska-Kułak et al. In 2001 they determined new biotypes O-T [13]. Details are presented in (*Tab. 2*).

The data were analysed by the Wilcoxon matched-pairs signed-ranks test and Chi^2 test with the Statistica 6.0 program.

Results

In 1999 year, 17 of 19 *Candida albicans* tested isolates had hydrolytic activity, the highest activity had leucine arylamidase, esterase, and cystine arylamidase. In 2003 year, 18 of 19 *Candida albicans* isolates had hydrolytic activity. The highest enzymatic activity had leucine arylamidase, esterase lipase, and esterease (*Tab. 3*). No significant differences in the enzymatic activity between 2003 and 1999 year were found.

Almost 87% of the strains were classified into biotypes F (33.7%) and A (30.4%) according to Wilimason's, in 1999 year. Only 8.7% of the strains were determined as K and M biotypes according to Kurnatowska's and Kurnatowski's classification. Four strains (4.3% of tested strains) were classified into Krajewska-Kułak et al. classification (*Tab. 4*). In 2003

Table 2. **Biotyping of the strains on the basis of their enzymatic activity**

BIO-TYPE	Enzyme E 2 Esterase	E 6 Valine arylami-dase	E 11 Naphtol-AS-BI-phos-phohydrolase	E 15 α-gluco-sidase	E 17 N-acetyl-β--glucosa-minidase
Biotype vs Williamson's 1996					
A	+	+	+	+	+
B	+	-	+	+	+
C	+	+	+	-	+
D	+	+	-	+	+
E	+	+	+	-	-
F	+	+	+	+	-
G	+	-	+	+	-
H	+	+	-	-	-
Biotype vs Kurnatowska and Kurnatowski 1998					
I	-	-	-	-	+
J	-	-	-	+	+
K	+	+	-	+	-
L	+	-	+	-	+
M	+	-	+	-	-
N	+	-	-	-	+
Biotype vs Krajewska-Kułak et al. 2001					
O	+	-	-	-	-
P	+	-	-	+	-
R	-	+	+	+	+
S	+	+	-	-	+
T	+	-	-	+	+

year, 93.5% of the tested strains were classified into biotypes A (67,4%) and F (18,5%) according to Wilimason's. Only 4.3% of the strains were determined as K and M biotypes according to Kurnatowska's and Kurnatowski's classification. Two strains (2.2% of tested strains) classified into biotypes according to Krajewska-Kułak et al. (*Tab. 4*).

No significant differences of the enzymatic activity between 2003 and 1999 year were found among Wilimason's biotypes.

Disscusion

The release of hydrolytic enzymes into the environment by dermatophytes and the yeast like fungi strains is an important factor in their pathogenicity and tissue destruction. The fungal enzymatic activity and their character is a susbstantial factor in virulence and adaptation [14-18].

These findings may suggest that drug – resistant strains have a higher enzymatic activity than sensitive strains. The API ZYM offers a useful method for the biotyping of *Candida albicans*. We assessed 19 hydrolytic enzymes by this method.

Some strains isolated from the vagina needed new classification and we designated them as a biotype O. Lane and Garcia have demonstrated (*in vitro*) that *Candida albicans* phospholipase (responsible for hydrolysis of phospholipids – the main component of membrane cells) is a factor in their virulence and resistance to animycotics [19]. Białasiewicz et al., have shown different hydrolytic activities of yeast like strains independent of the species using the API ZYM test. These authors have

Table 3. **Enzymatic activity (in score scale) of the *Candida albicans* strains isolated from cancer patients with candidiasis during 5 last years**

Scale	Number of enzyme / number of strains E1	E2	E3	E4	E5	E6	E7	E8	E9	E10	E11	E12	E13	E14	E15	E16	E17	E18	E19
Year 1999																			
0	22	2	0	40	0	17	16	78	74	12	10	86	76	92	16	80	60	88	92
1	40	14	6	46	4	26	14	12	12	38	44	6	6	0	27	10	14	4	0
2	16	39	12	6	4	25	17	2	4	32	19	0	2	0	20	2	4	0	0
3	10	27	42	0	14	18	25	0	2	10	15	0	2	0	14	0	5	0	0
4	2	3	20	0	36	4	11	0	0	0	4	0	0	0	6	0	3	0	0
5	2	7	12	0	34	2	9	0	0	0	0	0	6	0	9	0	6	0	0
Mean values of the enzymatic activity																			
N=92	1.3 ±1.1	2.4 ±1.1	3.2 ±1	0.6 ±0.6	4 ±1	1.7 ±1.2	2.3 ±1.5	0.2 ±0.4	0.3 ±0.6	1.4 ±0.6	1.6 ±1	0.07 ±0.2	0.5 ±1.3	0 ±0	1.9 ±1.5	0.2 ±0.4	0.9 ±1.5	0.04 ±0.2	0 ±0
Total mean – 1.19±1.1																			
Year 2003																			
0	10	1	0	32	0	6	9	68	71	5	4	89	83	92	7	57	28	66	90
1	61	8	4	51	1	24	17	23	18	34	38	3	2	0	22	31	10	26	2
2	14	37	26	9	5	40	38	1	2	35	39	0	1	0	36	4	6	0	0
3	5	42	48	0	26	19	21	0	1	18	9	0	1	0	19	0	12	0	0
4	1	1	8	0	34	2	5	0	0	0	2	0	2	0	4	0	15	0	0
5	1	3	6	0	26	1	2	0	0	0	0	0	3	0	4	0	21	0	0
Mean values of the enzymatic activity																			
N=92	1.2 ±0.8	2.5 ±0.8	2.8 ±0.9	0.8 ±0.6	3.9 ±0.9	1.9 ±0.9	2.02 ±1.1	0.3 ±0.4	0.3 ±0.6	1.7 ±0.8	1.6 ± 0.8	0.03 ±0.2	0.3 ±1.1	0 ±0	2.03 ±1.1	0.6 ±0.6	2.4 ±2	0.3 ±0.5	0.02 ±0.1
Total mean – 1.3±1.1																			

***Table 4*. Enzymatic biotyping of the strains isolated from oral cavity of cancer patients**

BIOTYPE	Year 1999	Year 2003
Biotype vs Williamson 1999 year – 87% 2003 year – 93.5%		
A	28 (30.4%)	62 (67.4%)
B	2 (2.2%)	1 (1.1%)
E	6 (6.5%)	3 (3.3%)
F	31 (33.7%)	17 (18.5%)
G	9 (9.8%)	2 (2.2%)
H	4 (4.3%)	1 (1.1%)
Biotype vs Kurnatowska i Kurnatowski 1999 year – 8.7% 2003 year – 4.3%		
K	4 (4.3%)	2 (2.2%)
M	4 (4.3%)	2 (2.2%)
Biotype vs Krajewska-Kułak et al. 1999 year – 4.3% 2003 year – 2.2%		
O	2 (2.2%)	1 (1.1%)
R	2 (2.2%)	1 (1.1%)

also reported an enzymatic activity of 15 out of 19 hydrolases of *Candida albicans* mouth isolates [20,21].

Kurnatowska and Kurnatowski determined the activity of 19 hydrolytic enzymes for 146 strains of *Candida albicans* from patients with various stomatological diseases (gingivitis, adult periodontitis, juvenile periodontitis, glossitis, leukoplakia, stomatitis prothetica, stomatitis atrophica) using the API ZYM [1]. According to their capacity for releasing hydrolytic enzymes 12 biotypes characteristic of *Candida albicans* were found [1]. Of 146 strains of Candida determined from the oral cavity only 60% complied with Williamson's classification [1].

In our earlier studies on 993 *Candida albicans* strains isolated from oral cavity (92 patients with symptoms of candidiasis and 63 healthy people), from vagina (607 patients with candidiasis and 95 healthy people), from urethra (83 patients with candidiasis), from skin (15 patients), nails (18 patients), ulcera (10 patients) and from stomach (10 patients) with different stomach disease were assessed and 132 of *Candida albicans* strains isolated from patients with candidiasis of urethra and 160 from vagina were evaluated. We found that isolates from patients with oral candidiasis more frequently were assigned the biotypes F (33.7%) and A (30.4%). Overall 89.1% of strains were classified into Williamson's classification but only 4.3% had new signs of biotypes. However, 35% of isolates from healthy subjects were assigned to the new biotypes.

Conclusions

The results of present study indicate that most of tested strains were classified into Wiliamson's system. Our results suggest that other Candida biotypes need to be determined according to their different enzymatic activity and susceptibilities.

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Quantitative EEG analysis of REM sleep in children with Down syndrome

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Abstract

Purpose: **The aim was to compare quantitative EEG analysis of REM sleep in children with Down syndrome (DS) and normal age-matched controls.**

Material and methods: **Twenty-one channel EEG of 21 patients with Down syndrome and 21 normal children, with ages ranging from 1 to 8 years, were submitted to quantitative analysis EEG of discharge-free epochs. The signals were recorded using a set of 17 (F3, F4, F7, F8, Fz, C3, C4, Cz, P3, P4, Pz, O1, O2, T3, T4, T5, T6) scalp electrodes. For each child, 20 artifact – free EEG epochs, each of 2 s without epileptiform discharges were selected for spectral analysis to calculate spectral power. Delta, theta, alpha and beta frequency ranges were compared between groups for all electrode positions.**

Results: **Quantitative analysis of the REM sleep from DS group disclosed reduction of the power mainly in the alpha when comparing the healthy group. Beta, theta and delta bands did not differ significantly between the groups.**

Conclusions: **Our findings agree with recent evidences that these children may differ from children normal development.**

Key words: EEG, Down syndrome, quantitative analysis sleep.

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Introduction

Down syndrome (DS) is a chromosomal mutation in which the affected individual has three copies of chromosome 21. The prevalence of DS in the population is therefore almost entirely maintained by mutation [1,2]. The probability that a woman will give birth to a child with DS increases with increasing maternal age, with a steeper rate of increase after about age 34. To date there is no evidence for any racial differences or change over time in the maternal age-specific rates [1,3]. Several studies have reported that the observed DS live birth prevalence has remained steady or increased since the early to mid 1980s despite an increase in the percentage of women using prenatal diagnosis and an increase in the number of DS fetuses detected.

DS is one of the most serious and most frequently reported major congenital malformations among liveborn children, accounting for 25%-35% of severe mental retardation [3,4,5]. The short-term prognosis for a baby born with DS today is much better than it was in the past [5] and life expectancy has also improved [6]. Many authors have analysed the importance of the relationship between REM sleep and learning or memory [7,8,9].

On the other hand a quantitative EEG (power spectra and coherence) provides objective measures in the search for global or focal abnormality which, if present, may signal an underlying organic or non-organic processes [10,11,12,13]. Petit et al. [14] showed that EEG slowing during REM sleep is a more sensitive biological marker of Alzheimer's disease than is EEG slowing during wakefulness. The REM sleep EEG measure allowed complete discrimination of AD patients at mild to moderate stages from age-matched control subjects.

Although quantitative analysis of EEG background activity has been frequently done [15,16], the studies that dealt with this particular aspect on EEGs were rare in children with DS. Most previous studies [15,17,18,19] on EEG in patients with DS were conducted in adult patients or at school age.

However, one theoretical possibility is that quantitative analysis of the background activity could disclose subtle abnor-

malities not detected by visual analysis. This study was done to test this possibility.

Material and methods

Patients

Twenty-one patients aged 1-8 years old with genetically confirmed Down were included in this study. EEGs were recorded from 9.00 to 12.00 during days. Patients did not take any pharmacological agents which could exert effects on sleep or EEG. Patients with seizures or epilepsy were excluded from the study. The control group included twenty-one normal subjects, matched for chronological age and gender.

EEG

EEG recordings were performed while the patients were in a REM sleep during the first 40 minutes. EEG signals were recorded from scalp electrodes (according to the International 10-20 system), all correlated with the vertex reference. The signals were recorded using a set of 17 (F3, F4, F7, F8, Fz, C3, C4, Cz, P3, P4, Pz, O1, O2, T3, T4, T5, T6) scalp electrodes, and amplified and filtered by a Elmiko, Warsaw, Poland. We used Ag/AgCl electrodes, with an impedance less than 5 kΩ. Visual analysis of EEG was performed before the quantitative assessment. For each child, 20 artifact – free EEG epochs, each of 2 s without epileptiform discharges were selected for spectral analysis to calculate spectral power using (the Elmiko software) in according Achermann's and Borbely [16]. The sampling frequency was 240 Hz. Frequencies below 1 Hz and above 70 Hz were eliminated by digital filtering. The respiratory signal was first filtered with a low-pass filter. The channels were recorded relative to a vertex reference. A fast Fourier transformation algorithm of signal processing was used to obtain the power spectrum of each lead. For the statistical evaluation of the EEG phenomena: absolute power spectrum and coherence values were calculated within 4 frequency bands: delta (1-3.99 Hz), theta (4-7.99 Hz), alpha (8-12.99 Hz), and beta (13-30 Hz).

Statistical analysis

Wilcoxon's test was applied to determinate the probabilities in all the groups, in power spectra. Each of the frequency bands was analysed separately. Statistics were obtained using the Statistica 6.0.

Results

Visual analysis of background activity showed no abnormalities in the EEGs from all the subjects of the control children. In children with DS sleep REM was less pronounced as compared to controls. Quantitative analysis of the sleep REM from DS group disclosed reduction of the power mainly in the alpha when comparing the healthy group (*Fig. 1*). Moreover, beta, theta and delta bands did not differ significantly between the groups. In the spectral analysis, we detected significant ($p<0.001$) decrease of alpha bands at occipital derivations (*Fig. 2*).

***Figure 1*. EEG Power spectra of REM sleep in children with Down syndrome (n=21) and controls (n=21). *p<0.001 vs control**

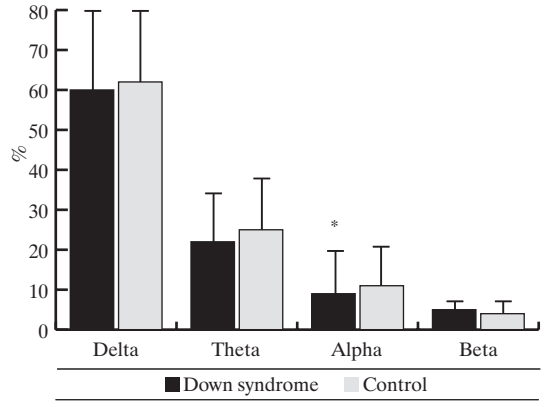
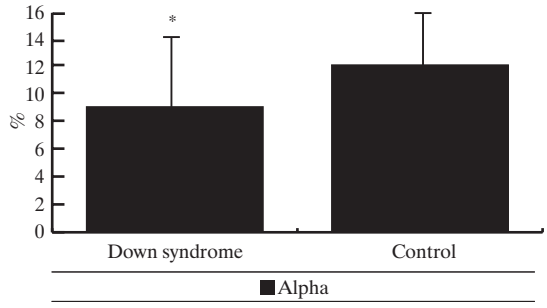


***Figure 2*. Alpha bands at 01 and 02 derivations in patients with Down syndrome (n=21) and control group (n=21) during REM sleep. * p<0.001 vs control**



Discussion

In the present study, we did not find significant differences in the general distribution (delta, theta and beta bands) between children with DS and controls. However, we detected significant decrease of alpha bands at total EEG and at occipital derivations. Our findings are agreement with previous results on EEG in patients with DS [15,17,18,19].

Down's syndrome patients express a neurodegenerative disorder and mental retardation. Partanen et al. [17] studied 32 patients with Down's syndrome and 31 controls for blocking of occipital EEG activity. DS patients and controls showed significant diminution of alpha, beta and theta activity and decrease of EEG frequency with eyes closed/eyes opened. However, there was a significant impairment in DS in the eyes closed/eyes opened ratio in alpha band, compared to controls. They had also significant correlations of the alpha eyes closed/eyes opened ratio and neuropsychological test scores. DS also showed significant differences in resting EEG variables, compared to the controls, even if the conventional EEG showed normal or mildly slowed dominant occipital rhythm in most of the patients.

The EEG may be an important tool in the clinical diagnosis of Alzheimer-type dementia in patients with Down's syndrome and other disorders [18,19,20,21]. Visser et el. [20] analysed the

role of EEG in the diagnosis of Alzheimer-type dementia in patients with Down's syndrome. Almost 197 patients with DS were monitored for 5 to 8 years. EEGs were scored in a blind fashion, and changes in the EEG were compared to changes in cognitive functioning. Cognitive functioning was drastically reduced in 29 patients. The dominant occipital rhythm became slower at the onset of the cognitive deterioration, and eventually disappeared. In 11 of these patients neuropathological examination showed a severe form of Alzheimer's disease. They postulated that changes in the frequency of the dominant occipital rhythm could distinguish between Alzheimer's disease or other causes as underlying the cognitive decline. Slowing of the dominant occipital rhythm seems to be related to Alzheimer's disease in patients with DS, and the frequency of the dominant occipital activity decreases at the onset of cognitive deterioration.

A slowing of alpha rhythm in patients with DS is considered as a manifestation of premature aging [19]. Ono et al. [19] performed spectral analysis of EEG in patients with DS aged 15 to 54 and compared with two control groups; healthy volunteers and mentally retarded people without DS. The frequencies of occipital alpha rhythms of DS patients showed a significant inverse correlation with chronological age, while comparison group did not. The average frequencies of DS were significantly low even in the youngest age-group in comparison with those of control, and also decreased in the age-groups of 35 and older compared with mental retardation.

In another study, the relation of EEG alpha background to cognitive function and cerebral metabolism was evaluated [21]. Patients and control subjects had EEGs, psychometric testing, quantitative computed tomography, and positron emission tomography with fludeoxyglucose. All the control subjects, the 13 young adult patients with Down's syndrome, and the 5 older patients with DS had normal EEG backgrounds. In comparison with the age-matched patients with DS with normal alpha background, older patients with DS with decreased alpha background had dementia, fewer visuospatial skills, decreased attention span, larger third ventricles, and a global decrease in cerebral glucose utilization with parietal hypometabolism. In the young patients with DS, the EEG background did not correlate with psychometric or positron emission tomographic findings, but the third ventricles were significantly larger in those with abnormal EEG background. The young patients with DS, with or without normal EEG background, had positron emission tomographic findings similar to those of the control subjects. The mechanism underlying the abnormal EEG background may be the neuropathologic changes of Alzheimer's disease in older patients with DS and may be cerebral immaturity in younger patients with DS. Quantitative EEG is a sensitive method in the determination brain maturation and reorganization in children with cerebral palsy [22].

Conclusions

In conclusion quantitative analysis of the REM sleep from Down syndrome group disclosed reduction of the power mainly in the alpha when comparing the healthy group. Beta, theta and delta bands did not differ significantly between the groups.

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The assessment of oxygen metabolism selected parameters of blood platelets exposed to low frequency magnetic radiation in cars – in vitro studies

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Abstract

Purpose: **The aim of the study was to determine how free radicals generation in blood platelets exposed to electromagnetic field (EMF) occurring in cars affects the process of these morphotic elements cell membranes phospholipid peroxidation.**

Material and methods: **The suspension of human blood platelets was exposed to EMF of proper characteristics in a specially arranged research stand. After 30, 60 and 90 min exposure of the platelet specimen to EMF, free radicals generation was measured with chemiluminescence and malondialdehyde concentration according to Placer et al. method. The obtained results were compared with the control values.**

Results: **The increase of free radicals generation was observed after 30 and 90 min exposure of platelets to magnetic field. Malondialdehyde reached the highest values also after 30 and 90 min exposure of the platelets to EMF as compared to the control.**

Conclusions: **The increase in oxygen reactive species generation under the effect of exogenic magnetic radiation as well as proportional intensification of the peroxidation process determined on the basis of malondialdehyde concentration (the marker of this phenomenon) point to the platelet sensitivity to the investigated environmental factor.**

Key words: electromagnetic field (EMF), blood platelet, free radicals (FR), malondialdehyde (MDA), car.

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Introduction

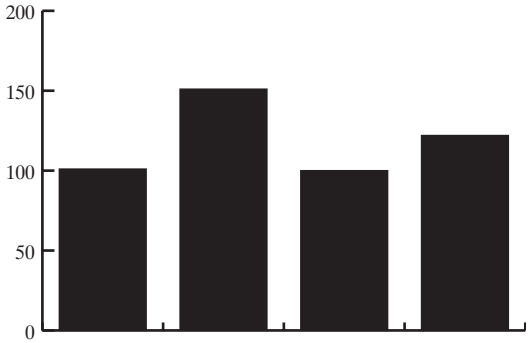
The life environment of a man has undergone significant changes as the result of rapid technological development. At present, the biosphere is formed by overlapping the natural conditions of the environment with the factors being the effect of evolutionary technological and industrial transformations. Electromagnetic smog may be an example of a confrontation of natural phenomena with these artificially produced.

The natural magnetic field of the earth amounts dependently on the place of measurement from 40 to 60 μT. Electromagnetic field from artificial emitters overlaps radiation. Most frequently environmental and occupational exposure concerns radio and microwave frequencies (100 kHz – 3 GHz) and power frequencies (50, 60 Hz). Numerous studies have been carried out describing the effect of the above mentioned electromagnetic field on a human organism [1,2].

In our environment, EMF of different parameters than those mentioned is more and more frequently observed. Significant development of motorization resulted in the increase of the number of subjects exposed environmentally and occupationally to electromagnetic radiation emitted by car electronics. A modern car vehicle, apart from conventional electronic equipment i.e. ignition system, feed system and lightning and signalling installations, is equipped in electronic systems increasing the comfort and safety of driving (e.g. Airbag, ABS, ASR and others) [3]. Development of the vehicle electronic equipment requires the development of electrical installation. Modern electrical installation due to its task, covers with a dense net practically the whole inner side of the car floor and instrument panel. The impulse interference field from electronics is characterised by magnetic component of induction not exceeding 1 mT and frequency form 0.5 to 3 kHz [4].

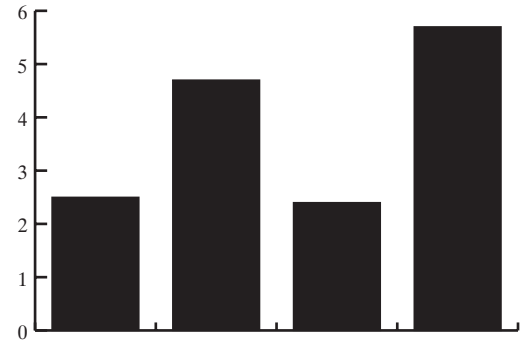
On the basis of the carried out studies on the effect of EMF on the human organism, oxygen metabolism of cells exposed to electromagnetic radiation was found to be the possible indicator of the organism sensitivity to this environmental factor. Some significant biological effects of the systems susceptibility to EMF

Figure 1. **The measurement of free radicals generation with the chemiluminescence method dependent on the exposure time to magnetic field, n=25 (values expressed in thousand impulses per 30 min)**



platelets	0 min	30 min	60 min	90 min
+ EMF	104.876875	155.6300476	103.1443636	121.4622381
SD	33.32015822	55.00504102	18.5001301	19.97156189

Figure 2. **The measurement of malondialdehyde concentration dependent on the exposure time to magnetic field, n=25 (values expressed in nmol/10^9 blood platelets)**



	control	30 min	60 min	90 min
x	2.55	4.63	2.58	5.63
SD	0.29	0.68	0.75	1.01

were recognized [5]. The process of phospholipid peroxidation of cell cytoplasmatic membranes is one of the best described.

The carried out own studies concern the effect of EMF occurring in a car cabin on oxygen metabolism of blood platelets being an important element determining the process of hemostasia in a human organism.

Aim

The aim of the study is to determine to what degree free radicals generation in blood platelets exposed to EM (induction: 0.5 mT, frequency: 1 kHz) occurring in cars affects the process of these morphotic elements cell membranes phospholipid peroxidation.

Material and methods

The suspension of human blood platelets obtained from blood-donation centre from voluntary blood donors was the material for the study. Those donors were examined, contraindications were excluded and laboratory blood tests typical for blood donors were performed. The preparation was transported from the blood bank in a container made of transformer plate which shielded the material against EMF occurring in the car cabin.

The parameters of magnetic waves occurring in the car cabin were reproduced in laboratory conditions. Holmholtz coils generating electromagnetic field which affects blood platelets placed in 8 polyethylene test-tubes (*Fig. 1*) are the main element of the research stand. Each test-tube may contain maximum 2 ml of blood sample. Geometric measurements of Holmholtz coils and their distance are selected in such a way that the magnetic component of the field stimulating the preparation had a homogenous course and was characterised by induction of values occurring in vehicles. The study was carried out according to the demonstrated procedure. The polyethylene test-tube containing blood platelets up to 2 ml of volume was placed in a research stand exposed to the electromagnetic field of induction B 0.5 mT and the frequency 1 kHz for 30, 60 and 90 min to maintain optimal conditions, the ambient temperature of the research stand and the temperature inside the luminometer was kept at 25^0C.

Chemiluminescence measurement was performed in the control and the study sample. The control sample included the platelet suspension with PBS and luminol (indispensable to intensify chemiluminescence) whereas, the study sample electromagnetic field stimulated platelet suspension with PBS and luminol. Chemiluminescence was measured with luminometer Lumicom (HAMILTON) co-operating with IBM computer. Simultaneous sequential measurement was performed for 6 samples.

Malondialdehyde concentration was investigated each time after definite time exposition to EMF (30, 60 90 min) with Placer's method [6]. Follow-up examinations were performed according to the above presented procedure, however with blood platelets not exposed to EMF effect.

The obtained results were statistically analysed with t-Student test for two means at $p \leq 0.05$.

Results

The measurements of free radicals generation performed in accordance with the presented methodology, demonstrated the highest increase of generation after 30 and 90 min exposure to the investigated electromagnetic radiation as compared to the value of the control sample (*Fig. 1*). The highest malondialdehyde concentration was observed also after 30 and 90 min exposure to the investigated electromagnetic radiation as compared to the value of the control sample (*Fig. 2*).

Discussion

Every exogenic factor inducing the increase or decrease of free radicals generation carries with it significant biological consequences [7]. These particles due to high reactivity belong

to destabilizers of biological systems in which they appear [8,9]. Blood platelet is one of the biological systems on which the effect of EMF on free radicals generation is investigated. This cell has a certain specificity in oxygen reactive species generation as compared to other blood morphotic elements.

In blood platelets, there are several sources of oxygen reactive species (ROS) generation. Breathing chain found in mitochondria is one of them. The mentioned cell structures are not found in erythrocytes, which however have in their particle Fe^{2+} atom (of debatable function in ROS generation), while granulocytes defensive function is mainly associated with enzymatic activity of oxidase NADPH (generating anion-radical) [10]. Earlier experiments carried out on blood platelets determined the effect of EMF emitted by cell phones of the frequency 900 and 1800 MHz on blood platelets and exposure of the above mentioned morphotic elements to EMF of power frequency 50 Hz and induction 15 mT. The obtained results demonstrated unambiguously changes in blood platelets oxygen metabolism stimulated with the mentioned EMF radiation [11,12].

At present, the carried out own studies concerning free radicals generation in blood platelets under the effect of EMF of definite parameters, confirm sensitivity of these cells to non-ionizing radiation of definite parameters. The increase of free radicals in blood platelets observed after 30 and 90 min in EMF points to the existence of the dependence between cell oxygen metabolism and the investigated radiation.

Upset balance of intracellular ROS generation consisting in the increase of free radicals compared to the norm was also observed in other studies concerning the effect of non-ionizing radiation on biological systems [13,14]. Keeping the lowest possible level of free radicals generation is important due to their infavourable effects on biological systems. Cell membranes phospholipid peroxidation is one of the best known biological effects of excessive free radicals generation. This free radical chain reaction of oxidation of polyunsaturated fatty acids being included in cytoplasmic membranes phospholipids, was a decissive effect on blood platelets function causing activation of the mentioned blood morphotic elements (adhesion, aggregation). The process of cell membranes lipid peroxidation has been recognized as the effect of the lack of the defensive capability of antioxidative systems and thus remains one of the main pathomechanisms investigated in the case of the determination of cellular changes associated with oxidative stress.

There are scarce studies describing the effect of EMF on the blood platelets antioxidative system. Dependently on the radiation parameters, the increase of malondialdehyde concentration was demonstrated, pointing to the process of cell membranes peroxidation being in progress [15] or to the lack of MDA quantitative changes in comparison to the control samples (such results were often obtained for EMF values used in physiotherpy – stimulation of regenerative processes, among others by the application of magnetic field, proceeds as a result of increased activity of antioxidative defense enzymes and inhibited lipid peroxidation process, what accelerate the regenerative process of the damaged tissues [16].

The observed changes in malondialdehyde concentration prove that there may come to increased peroxidation of arachidonic acid – the component of blood platelets cell membranes phospholipids, under the effect of electromagnetic field emitted by car electronics. The increase of MDA concentration in the investigated time intervals speaks for insufficient adaptation of cell antioxidative mechanisms of blood platelets protecting against oxidation of cell membranes components, with all the above mentioned effects of this process.

Conclusions

1. The observed changes in malondialdehyde concentration prove that there may come to increased peroxidation of arachidonic acid – the component of blood platelets cell membranes phospholipids, under the effect of electromagnetic field emitted by car electronics.
2. The increase of MDA concentration in the investigated time intervals in response to excessive free radicals generation in blood platelets speaks for insufficient adaptation of cell antioxidative mechanisms of the mentioned blood morphotic elements protecting against oxidation of cell membranes components with all biological effects of this process.

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Indoor air studies of fungi contamination of social welfare home in Czerewki in north-east part of Poland

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Abstract

Purpose: **The contamination of the indoor environment with yeast-like fungi and moulds in social welfare home in Czerewki was evaluated.**

Material and methods: **The concentration of airborne fungi (in front of the building and in the corridors, patient rooms, study rooms, recreation rooms, kitchens, bathrooms, toilets) was determined using SAS-Super 100 (Pbi International). The fungal concentration on walls was assessed using the Count-Tact applicator and the plate Count-Tact irradiated (BioMerieux). Swabs were taken from the skin of the interdigital spaces of feet and hands, nails and the oral cavity of the residents. The fungi from the swabs were cultured on Sabouraud medium. Fungi were identified using standard microbial procedures.**

Results: **Tests of air and walls revealed significant differences in mycological flora in depending on the place isolation (e.g. corridor, rooms, reading room, nurse, room, kitchen, dining room, bathroom) and season (summer, autumn, winter, spring). A significant increase in the fungi isolated from the air and walls in the social welfare home was found, depending on the season.**

Conclusion: **An increase in the fungi isolated from residents was found in relation to the season.**

Key words: social welfare homes, Fungi, air studies.

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Introduction

Since Feinberg's studies (1955), it has been well established that fungal spores play a major role in allergic diseases such as asthma, hay fever and hypersensitivity pneumonitis and that they may cause serious systemic infections in some areas. In most cases there is no exposure to true or opportunistically pathogenic fungi, but there are species that can act as allergens or cause other non-allergic symptoms [1]. Moulds readily enter indoor environments by circulating through doorways, windows, ventilation systems, and air conditioning systems. Spores in the air also deposit on people and animals, bags, and pets common carriers of mold into indoor environments. The most common indoor moulds are *Cladosporium*, *Penicillium*, *Aspergillus*, and *Alternaria* [1,2]

The presence of microorganisms in the patients' environment has a direct influence on the condition of these people. The quality of air and the number of pathogens depend on the condition and cleanliness of the building, appropriate humidity and temperature and good ventilation, access to light, oxygen and water [3-6]. Some indoor moulds have the potential to produce extremely potent toxins called mycotoxins. Mycotoxins are lipid-soluble and are readily absorbed by the intestinal lining, airways, and skin.

Until recently, there was only one published report in the United States linking airborne exposure to mycotoxins with health problems in humans [7]. This report described upper respiratory tract irritation and rash in a family living in a Chicago home with a heavy growth of *Stachybotrys atra*. The investigators documented that this mold was producing trichothecene mycotoxins. The symptoms disappeared when the amount of mold was substantially reduced.

The pathogenic process depends on the quality and the condition of the building as well as on the time of exposure to fungi spores present in the air [1,2].

Air filters of various types, selected on the basis of discoloration, were collected from the primary and secondary filter banks of the heating, ventilating, and air-conditioning systems

in seven hospitals in the eastern United States and examined with direct microscopy for fungal colonization [8]. Microscopic observations and culture results showed that filters from five of the hospitals were colonized with fungi including species of *Acremonium*, *Alternaria*, *Aspergillus*, *Cladosporium*, *Epicoccum*, *Penicillium*, and *Rhinocladiella*, and a *Beauveria*-like fungus. Several of these commonly airborne species, e.g. *Epicoccum purpurescens* and *Rhinocladiella* had not been previously reported to colonize air filters [6,8,9].

We studied the fungi contamination of the social welfare home in Czerewki in relation to season. We wanted to investigate whether is some relationship between incidence of the fungi in air and the isolated from the residents of the social welfare home.

Material and methods

Investigations were carried out in a social welfare homes in Czerewki. The home was loacted in the village of Czerewki, about 20 km from the city. The building was built 15 years ago. Air was sampled at the entrance to building, corridors, patients' rooms, nurses' rooms, dining rooms, bathrooms, store rooms, recreation rooms and reading room. Total number of tested rooms in Czerewki was 34. Swabs were taken from the walls, and the feet, hands, and nails of the residents of the social welfare home. Air samples were obtained by using SAS-Super 100. The Surface Air System (SAS) encompasses several models which use the same principle. Air is aspirated at a fixed speed for a variable time through a cover which, has been machined with a series of small holes to a special design. The resulting laminar air flow is directed onto the agar surface of a "Contact Plate" containing medium consistent with the microbiological examination to be made. When the present sampling cycle is completed, the plate is removed and incubated. The organisms are then visible to the naked eye and can be counted for an assessment of the level of contamination. SAS – Super 100 possess several references [10-12]. Air samples (1 minutes) were taken with the SAS. The sampler was at the center of the room. The windows were closed for at least 1 h prior to sampling. Samples were taken in the morning between 10 and 11 clock. Next they were shipped to the laboratory within 2 h under cool conditions and incubated at 25°C for 5 days. Colonies of filamentous fungi were identified to genus level on the basis of colonial and microscopic morphology. Swabs were taken from the skin of the interdigital spaces of feet and hands, nails and the oral cavity of the residents. The fungi from the swabs were cultured on Sabouraud medium and incubated at 25°C. The yeast-like fungi strains were identified by using Candi*Select* (Bio-Rad). Moulds and dermatophytes were identified in the direct examination and microculture. Dermatophytes were incubated at 37°C for overnight and next were incubated at 20°C for 7 weeks.

The number of organisms counted on the surface of the "Contact Plate" must first be corrected for the statistical possibility of multiple particles passing through the same hole. The statistical formula is taken from (Correction Tables – from producer) for both the 55 mm standard Contact head and the 84 mm Maxi-Contact head. The probable count (Pr) is then used to calculate The Colony Forming Unit (CFU) per cubic meter of air sampled.

Results were calculated according to the following formula:

$$X = \frac{Pr \times 1000}{V} \text{ CFU per 100 litres of air (1000 litres} = 1 m^3)$$

Where: V – volume of sampled air = 200 l of air, r – Colony Forming Units counted on "55 mm Contact Plates" = 67, Pr – Probable count obtained by positive hole correction = 80, X – Colony Forming Units per 1000 litres (=1 cubic metre) of air

The microbiological environment on the surface of the walls was evaluated by using the Count-Tact of bioMerieux. Materials for testing were collected using a special bioMerieux applicator. The medium was in accordance with the Draft Standard CEN/TC 243/WG2.

Statistical analysis

Statistical analyses are performed using Statistica release 5.0. To approximate a normal distribution were converted to log 10 units, and these transformed numbers were used for t-test. The least significant t-test was used for comparisons among air samples and the walls. Pearson's correlation coefficient was calculated to find correlations between the fungi isolation from air and the walls of the home.

Results

A summary of the results for airborne fungi and fungi colonies isolated from walls is presented in *Tab. 1* and *2*. Microbiological studies revealed significant differences in fungal flora between the place of isolation (corridor, rooms, nurses' room, kitchen, dinning room, bathroom etc.) and the season (summer, autumn, winter and spring). In the Czerewki social welfare home a significant ($p<0.001$) increase in fungi colonies isolated from the air during autumn, winter and spring was found compared with summer. Significant ($p<0.001$) differences between winter–spring and autumn–summer in the isolation of fungal colonies from the walls in the Czerewki home were found (*Tab. 2*). During summer in the Czerewki, only a few colonies were isolated from the air (*Tab. 3*). During the mycological examination in autumn a great variety of genera in the samples of air analyzed were observed: *Candida albicans*, *Penicillium*, *Aspergillus*, *Rhizopus*, *Cladosporium*, *Acremonium*, *Alternaria*. The dominant contaminants were *Candida albicans*, *Cladosporium* and *Rhizopus* (more than 200 CFU/m^3) (*Tab. 3*). During winter and spring, *Penicillium* was the dominant contaminant in the air (below 150 CFU/m^3).

During summer in the social welfare home, the dominant colonies isolated from the walls were *Cladosporium* and *Penicillium* (*Tab. 4*). *Alternaria*, *non-Candida albicans*, *Candida albicans* were isolated more often in autumn. The dominant colonies were *non-Candida albicans* and *Cladosporium* during winter. Similar results were obtained in spring. No significant correlations with indoor air fungi were found for fungi isolated from the walls during summer ($r=-0.24$, $p=0.57$ in the Czerewki

Table 1. **Fungi in the air in the social welfare home in Czerewki**

Rooms	Social welfare home in Czerewki n=34 rooms				
	Count (log 10 CFU/m³) of air				
	Summer	Autumn	Winter	Spring	Total
Patients rooms	0.6	2.65	1.53	2.24	2.82
Nurses' room	0	1.14	0	0.47	1.27
Recreation room	0	1.14	0.3	0	1.23
Store room	0.9	1.91	1.27	1.77	2.27
Dining room	0	0.47	0.69	0.3	1
Kitchen	0	1.5	0.69	0.3	1.59
Bathrooms	1	1.88	1.53	1.69	2.23
Corridor	0.3	1.41	0.6	0.77	1.57
Entrance to building	0	1.8	0.9	1.17	1.94
Mean ± SE	0.12 (0.08)	1.35 * (0.20)	0.52 * (0.17)	0.96* (0.26)	1.55 (0.19)

Data are means (standard error) of 34 * P<0.001 vs summer test-t

Table 2. **Fungi colonies isolated from the walls in rooms tested of the social welfare home in Czerewki in relation to the season**

Rooms	Social welfare home in Czerewki n=34 rooms				
	Number of fungi colonies (log 10) per plate Count-Tact				
	Summer	Autumn	Winter	Spring	Total
Patients rooms	1.16	3.13	1.86	2.35	3.33
Nurses' room	0	1.83	0.3	0.84	1.89
Recreation room	0	1.46	0	1	1.59
Store room	0	2.22	1.34	1.82	2.49
Dining room	0	1.23	1.3	1.14	1.7
Kitchen	0	1.14	1.65	0.47	1.79
Bathroom	0	2.43	1.55	1.8	1.56
Corridor	0	1.82	0.6	1	1.9
Mean ±SE	1.16* (0.18)	1.76* (0.20)	0.77 (0.22)	1.07 (0.14)	1.95 (0.21)

Data are means (standard error) of 34 samples * P<0.001 vs winter, spring, test-t

Table 3. **Fungi colonies isolated from the air in rooms tested of the social welfare home in Czerewki in relation to the season**

Fungi	CFU/m³ of air				
	Summer	Autumn	Winter	Spring	Total
Acremonium spp.	1	6	5	12	24
Alternaria spp.			9	11	20
Aspergillus spp.	9	32	22	32	95
Candida albicans		179	3	46	228
Chrysosporum spp.		7			7
Cladosporium spp.	7	203	12	73	295
Geotrichum			1	3	4
Monilia sitophila					
Mucor spp.				1	1
Mycelia sterola				8	8
Non-C.albicans		2	8	92	102
Penicillium spp.	5		35	88	128
Rhizopus spp.		364	4	4	372
Rhodotorula rubra		22	10	3	35
Scopulariopsis spp.		9			9
Trichophyton mentagrophytes v. interdigitale					
Trichosporon spp.					
Verticillium spp.					
Total	25	824	109	373	1331

Table 4. **Fungi colonies isolated from the walls in rooms tested of the social welfare home in Czerewki in relation to the season**

Fungi	Number of fungi colonies				
	Summer	Autumn	Winter	Spring	Total
Acremonium spp.		16	3	2	21
Alternaria spp.	78	586	2	29	695
Aspergillus spp.	150	30	12	14	206
Candida albicans		278	5	83	366
Chrysosporum spp.					
Cladosporium spp.	94	46	48	39	227
Geotrichum					
Monilia sitophila	21		1	3	27
Mucor spp.			14	4	18
Mycelia sterola			2		2
Non-C.albicans	82	289	49	83	503
Penicillium spp.	120	191	42	61	414
Rhizopus spp.					
Rhodotorula rubra	18			10	28
Scopulariopsis spp.			19		19
Trichophyton mentagrophytes v. interdigitale					
Trichosporon spp.					
Verticillium spp.					
Total	563	1436	197	328	2526

home). Significant ($p<0.05$) correlations with indoor air fungi were found for fungi isolated from the walls during the other three seasons.

In the Czerewki home mainly *Candida albicans* and *non-Candida albicans* were isolated from the patients (nails, feet, hands) during autumn. In the other seasons, only a few colonies were isolated from the patients in the home (*Tab. 5*).

Discussion

Our results show a significant increase the fungi isolated from the air during autumn. During autumn in the Czerewki home, there was significant increase of fungi colonies isolated from the air and the walls as compared with the summer. The identified genera suggests a mix contamination, originated from field and air. The dominant colonies isolated from the air and

***Table 5*. Total number of different types of fungi isolated from different ontocenoses of patients in the social welfare home in Czerewki**

Fungi	Social welfare home in Czerewki n=34 rooms				
	Number of fungi colonies				
	Summer	Autumn	Winter	Spring	Total
Acremonium spp.					
Alternaria spp.			1		1
Aspergillus spp.			1	2	3
Candida albicans	4	35			39
Chrysosporum spp.					
Cladosporium spp.	1		3		4
Geotrichum					
Monilia sitophila					
Mucor spp.					
Mycelia sterola					
Non-C. albicans		24			24
Penicillium spp.	1	1	6	4	12
Rhizopus spp.					
Rhodotorula rubra					
Scopulariopsis spp.					
Trichophyton mentagrophytes v. interdigitale					
Trichosporon spp.					
Verticillium spp.					
Total	6	60	11	6	83

the walls were: *Alternaria*, *Cladosporium Penicillium*, *Rhizopus*, *non-Candida albicans*, *Candida albicans*, during autumn and summer. *Candida albicans*, *non-Candida albicans* and *Penicillium* were isolated from the air and the walls more frequent than other fungi. Similar results we have noticed during winter, therefore the number of fungal colonies and CFU/m^3 were two fold lower. *Candida albicans*, *Penicillium*, *Aspergillus*, *Cladosporium* and *Alternaria* were isolated from the toe and finger nails and the interdigital spaces of the hands and feet during autumn. A similar study [13] carried out using both sedimentation and aspiration methods. These authors evaluated the occurrence of fungi in the indoor air, on the room walls and in certain sites on the skin of the inhabitants of the two social welfare homes in Cracow. The mean number of fungi in the rooms of the renovated ward amounted to 192.3/m^3. The mean number – 1243.5/m^3 of fungi in the old ward was significantly higher compared with the renovated one. The same mould genera and species were detected in both wards. The following mould genera (in decreasing order of frequency) were found: *Penicillium*, *Rhizopus*, *Alternaria*, *Mucor*, *Cladosporium*, *Chaetomium*. The same fungal genera isolated from the air, walls and the skin of residents in both the renovated and the old ward.

Papavassiliou and Bartzokas [14] assessed mycological flora of the Athenian air. The open plate technique was used, Petri dishes containing Sabourand's agar being exposed for 15 minutes. The genus Alternaria was most frequently isolated, representing 38% of the total colonies. Other genera occurred in the following proportions: *Penicillium* 27%, *Aspergillus* 13%, *Candida* 9%, *Rhodotorula* 6% and *Mucor* 1%. Species of other genera accounted for 6% of colonies, including 4% which were classified as *Mycelia sterilia*. Bartzokas [5] noted that during autumn and winter the number of suspended microfungi was more than double that which occurred during spring and summer. The fungal content appeared to be correlated positively with humidity and negatively with temperature, although during the analysis of the six predominant genera some exceptions were found to the general form of the results. Pei-Chih et al. [15] evaluated the airborne fungal concentrations at urban and suburban areas in Taiwan. In summer, the total fungal concentration, both indoors and outdoors of suburban homes, were significantly higher than those of urban homes. Shelton et al. [16] examined 12026 fungal air samples from 1717 buildings located across The United States; these samples were collected during indoor air quality investigations performed from 1996 to 1998. For all buildings, both indoor and outdoor air samples were collected with an Andersen N6 sampler. The fungal levels were highest in the fall and summer and lowest in the winter and spring. The most common culturable airborne fungi, both indoors and outdoors and in all seasons and regions, were *Cladosporium*, *Penicillium*, nonsporulating fungi, and *Aspergillus*: *Stachybotrys chartarum* was identified in the indoor air in 6% of the buildings studied and in the outdoor air of 1% of the buildings studied. Exposure to some fungi can induce allergic or asthmatic reactions, while other species can cause primary infectious diseases. The inhalation of spores containing mycotoxins has been shown to cause many of the symptoms typically associated with the "sick building syndrome"; for example the spores of *Aspergillus fumigatus* and *Histoplasma capsulatum* can cause hypersensitivity pneumonitis. Affected individuals often experience relief when they leave the building for several days [1]. Su et al. [17] investigated correlations among airborne microorganisms collected with Andersen samplers from homes in Topeka during the winter of 1987 to 1988. The factors derived were used to relate microbial concentrations with categorical, questionnaire-derived descriptions of housing conditions. The common soil fungi *Aspergillus* and *Penicillium spp*. were also separated as a group. Elevated concentrations of the soil fungi were significantly associated with the dirt floor, crawl-space type of basement. Elevated concentrations of water-requiring fungi, such as *Fusarium spp*., were shown to be associated with water collection in domestic interiors. Also, elevated mean concentrations for the group of fungi including *Cladosporium*, *Epicoccum*, *Aureobasidium*, and yeast spp. were found to be associated with symptoms reported on a health questionnaire. Miller et al. [18] studied the extent and nature of fungal colonization of building materials in 58 naturally ventilated apartments that had suffered various kinds of water damage in relation to air sampling done before the physical inspections. The results of air samples from each apartment were compared by rank order of species with pooled data from outdoor air. Approximately 90% of the apartments that had significant amounts of fungi in wall cavities were identified by air sampling. Ren et al. [19] characterized the nature and seasonal variation of fungi inside and outside homes in the Greater New Haven, Connecticut area. There indoor air samples (in the living room, bedroom, and basement) and one outdoor sample were collected by the Burkard portable air sampler. House dust samples were collected in the living room

by a vacuum cleaner. No significant difference in concentration and type of fungi between living room and bedroom or by season was observed. Both concentration and type of fungi were significantly higher in the basement than other indoor areas and outdoor air in winter. The type of fungi in living room, bedroom, and outdoor air were found to have significant changes among seasons, but there was no significant difference for the basement among seasons. *Cladosporium* species was dominant in both indoor and outdoor air in summer. *Penicillium* and *Aspergillus* were dominant in indoor air in winter, but neither was dominant in any season in outdoor air. The type of fungi and their concentrations in house dust samples were not representative of those isolated in indoor air. In the dust samples, more *Mucor*, *Wallemia*, and *Alternaria* species, but less *Aspergillus*, *Cladosporium*, and *Penicillium* species were found in the all seasons. Air sampling in spring or fall in every suspected house is suggested for year-round fungal exposure assessment.

Conclusions

Microbiological tests of air and walls revealed significant differences in mycological flora in depending on the place isolation (corridor, rooms, reading room, nurses room, kitchen, dining room, bathroom etc.) and season (summer, autumn, winter, spring).

A significant increase in the fungi isolated from the air and walls in the social welfare home was found, depending on the season. *Alternaria*, *Cladosporium Penicillium*, *Rhizopus*, *Non-Candida albicans*, *Candida albicans* were dominant fungi in the air and walls.

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In vitro antifungal activity of N-3-(1,2,4-dithiazole-5-thione)-β--resorcylcarbothioamide

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Abstract

The aim of the study was the determination of antifungal activity of N-3-(1,2,4-dithiazole-5-thione)-ß-resorcylcarbothioamide (DTRTA) against *Candida albicans*, *non-Candida albicans*, dermatophytes and molds and evaluation of the enzymatic activity *C. albicans* strains. We used reference strains *C. albicans* 10231 ATCC, 200 of *C. albicans* strains, 7 of *non-C. albicans*, 12 dermatophytes strains and 20 molds strains isolated from different ontocenoses from patients. DTRTA was synthesized at Department of Chemistry University of Agriculture in Lublin was used to tests. The mean MIC of DTRTA against *C. albicans* strains isolated from patients was 22.01 mg/L, for reference *C. albicans* 10231 ATCC – 12.5 mg/L on Sabouraud's medium (SB). The mean MIC of isolates from patients was 17.8 mg/L, and reference strains – 6.25 mg/L on YNB medium, respectively. The MICs of DTRTA against 7 *non-C. albicans* was 33 mg/L on SB and 18.2 mg/L on YNB. The MICs of DTRTA against dermatophytes ranged from 3 to 50 mg/L. The MICs of DTRTA against molds were 25 mg/L and 100 mg/L, respectively. *C. albicans* strains had the enzymatic activity of 16 among 19 hydrolases, after exposure to DTRTA, 15 among 19 enzymes, respectively. *Non-C. albicans* isolates had the enzymatic activity of 13 among 19 hydrolases, after exposure to DTRTA, 11 among 19 enzymes, respectively. This findings indicate hat DTRTA exerts a potent antifungal activity against the yeast-like fungi strains, dermatophytes and molds in vitro and.

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Introduction

The incidence of nosocomial infections by the yeast-like fungi strains has surged over the past decade from the eighth to the fourth most common cause of nosocomial bloodstream infection in the general hospital population [1]. In surgical patients, the incidence of Candida infections has increased from 2.5 to 5.6 per 1000 discharges with mortality rates of 30% to 75% [2,3]. In these reports the predisposing factors included: hematological malignancy, solid organ tumors, neutropenia, intravascular devices, hyperalimentation, antimicrobial therapy and corticosteroid therapy [4]. However, one result of widespread use of powerful antifungal drugs administered for increasingly broader indications has been a dramatic increase in the isolation of *non-Candida albicans* and resistant forms of Candida [5-7].

The discovery of the azole antifungal compounds, ketoconazole, itraconazole, and fluconazole, allowed for a broader spectrum of antifungal treatment and a shorter treatment duration [8]. These drugs act by inhibiting cytochrome P450-dependent ergosterol synthesis and cytochrome c oxidative and peroxidative enzymes. This disruption of enzymic processes ultimately leads to fungal cell death [8]. Advances made during the 1990s led to the introduction of a new allylamine, terbinafine, for the treatment of dermatophytoses [9,10]. However, the resistance of the yeasts to fungal agents is increasing. This still need to develop new antimycotics [11].

During the researches of the substances of fungistatic action the synthesis conditions of a new group of compounds with meta-substituted dihydroxybenzthioacyl moiety: 2,4-dihydroxythiobenzanilides modified in aniline ring and N-heterocyclic derivatives of 2,4-dihydroxythiobenzamide has been elaborated [12]. It has been suggested that these the

compounds exert and activity against the fungi and bacteria [13-16]. The compounds show a relatively wide range of fungistatic action. Depending on the type of modification of N-aryl fragment can act against the dermatophytes [14,15], yeasts [16,17] and molds [16,17]. The microbiological tests also show that these compounds act mainly against the Gram positive cells [18]. In search for new compounds with β-resorcylcarbothionyl moiety N-3-(1,2,4-dithiazole-5-thione)-β-resorcylcarbothioamide – DTRTA as a substance with expected antifungal activity was obtained. The aim of the study was the determination of antifungal activity of a new DTRTA against *Candida albicans*, *non-Candida albicans*, dermatophytes and molds and evaluation of the enzymatic activity *C. albicans* strains.

Materials and methods

N-3-(1,2,4-dithiazole-5-thione)-β-resorcylcarbothioamide (DTRTA) 0.025 mol of 3-amino-1,2,4-dithiazole-5-thione (2) and 0.01 mol of bis-(β-resorcylcarbothioyl)thionyl (1) was added into 50 ml of methanol and heated to boiling (3 hrs). After reaction completed, the mixture was hot filtered and added with 100 ml of water. Separated compound was filtered, washed with water and recrystallized from dilute (2:1) methanol (60 ml). bis-(β-resorcylcarbothioyl)thionyl as the starting material was prepared according to patent [12].

In order to define the antifungal activity of DTRTA, we tested against *Candida albicans* reference strains 10231 ATCC, 200 fresh clinical isolates of *C. albicans*, 7 isolates of *non-C. albicans*, 12 dermatophytes and 20 strains of molds (details are not shown).

The yeasts were identified to the species level by the CandiSelect (Bio-Rad), Fungiscreen 4H (Bio-Rad), Auxacolor (Bio-Rad) tests. Dermatophytes and molds were identified by standard methods. Prior to antifungal susceptibility testing, each isolate was passaged on SB or YNB medium to ensure optimal growth characteristics.

DTRTA was used in the tests. It was dissolved in 1% DMSO. Susceptibility testing was performed by the agar dilution method. For yeasts, dermatophytes and molds MICs were determined according to National Committee for Clinical Laboratory Standards (NCCLS) reference document M27 [19].

Sabouraud's medium – SB (Bio-Rad) and YNB (Dom Handlowy Nauki PAN in Cracow) were used. Starting inocula were adjusted by the spectrophotometric method densitometr (BioMerieux) to 1x 10^5 CFU/ml. Concentrations of DTRTA were ranging from 0.025 to 200 mg/L. Plates were incubated at 37°C and read after 24 h incubation. A solvent control was included in each set of assays; the DMSO solution at maximum final concentration of 1% had no effect on fungal growth. Concentrations of DTRTA were ranging from 0.025 to 200 mg/L. Dermatophytes inocula were prepared from 3 weeks colonies, cultured on SB medium. Control plates with SB medium without DTRTA or with 1% DMSO were prepared. Microcultures were incubated at 27°C, and MICs values read after 5 and 15 days. Molds inocula contained 1 x 10^5 CFU/ml. Petrie plates with tested media and serial dilutions of DTRTA were inoculated with 20 µl of molds suspension. Control plates were also prepared. Plates were incubated at 27°C and read after 5 days.

The enzymatic activity of the yeast-like fungi was performed by API ZYM test (BioMeriux). API ZYM is a semi-quantitative micromethod designed for the research of enzymatic activities. This method is applicable to all specimens (tissues, cells, biological fluids, microorganisms, washings, soil, oil, etc.). It allows the systematic and rapid study of 19 enzymatic reactions using only very small sample quantities. The API ZYM strip is composed of 20 microtubes where the bottom forms a sort of support especially designed to contain the enzymatic substrate and a buffer. This support allows for contact between the enzyme and the general insoluble substrate. All procedures were done according to the manufacturer's instructions. The results were determined by using the API ZYM color scale ranging from 0 (negative) to 5 (maximum), depending on the amount of substrate metabolized where: 1 – corresponds to 5 nmol, 2 – to 10 nmol, 3 – to 20 nmol, 4 – to 30 nmol and 5 – to >40 nmol.

According to The Nomenclature Committee of the International Union of Biochemistry and Molecular Biology: the following enzyme nomenclature [20] is valid 1. esterases (hydrolase esters of the carboxyl group – lipase and phospholipase A2 hydrolases, monoester phosphoric acid – alkaline phosphatase and acid hydrolases ester sulphuric – sulphatase), 2. glucosidases (α-glucosidase; β-glucosidase; α-mannosidase; N-acetyl-β-glucosaminidase), 3. peptidases (aminopeptidases, arylamidases, proteinases, elastases, collagenases, keratinases), and 4. ureases. We evaluated the enzymatic activity of the yeast-like fungi strains, before and after addition of DTRTA.

Student-t (two-tailed) test was used to compare mean MIC values, Wilcoxon's paired test was used to compare enzymatic activity before and after exposure of sample in sore scale. Significance was defined as a P value of 0.05.

Results

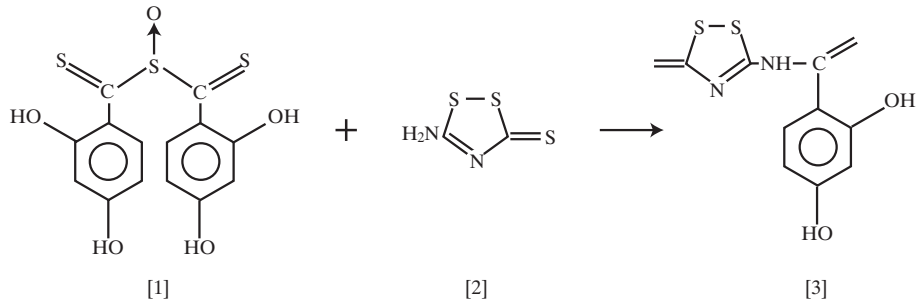
N-3-(1,2,4-dithiazole-5-thione)-β-resorcylcarbothioamide (DTRTA) was obtained in the reaction according to *Fig. 1*. The analytical data of compound were in agreement with the proposed structure. The purity was confirmed by HPLC and HPTLC chromatography in reversed-phase system (RP-8, RP-18, methanol-water).

DTRTA had a mean MIC of 12.5 mg/L for reference *C. albicans* 10231 ATCC on SB, 6.25 mg/L on YNB, respectively. DTRTA had MIC over the test range of 3-50 mg/L for *C. albicans* isolates on SB. A mean MIC for *C. albicans* isolates was 22.01 mg/L on SB, and 17.8 mg/L on YNB. Significant differences between reference *C. albicans* 10231 ATCC MICs on SB and YNB was found ($p<0.001$), between DTRTA MICs on SB and YNB was found ($p<0.05$).

DTRTA had MIC over the test range of 6.25 - 50 mg/L for *non-C. albicans* clinical isolates on SB and 3-25 mg/L on YNB (*Tab. 1*). The mean MICs of DTRTA against 7 *non-Candida* albicans isolates were 33 mg/L on SB, and 18.3 mg/L on YNB. Mean MIC for *non-C. albicans* strains for DTRTA was 19.5 mg/L.

Testing of the dermatophytes clinical isolates confirmed some antifungal activity of DTRTA against T. mentagrophytes

Figure 1. **Synthetic route and the structure of N-3-(1,2,4-dithiazole-5-thione)-β-resorcylcarbothioamide (DTRTA)**



[1] [2] [3]

v. interdigitale with a MIC at which 100% of the isolates are inhibited of 13.3 mg/L after 5 days of incubation, and 18.8 mg/L after 15 days, respectively (*Tab. 2*). DTRTA had a mean MIC of 10.9 mg/L for T. mentagrophytes v. granulosum after 5 days of incubation, and 21.9 mg/L after 15 days of incubation. A mean MIC of DTRTA against E. floccosum isolates was 12.5 mg/L after 5 and 25 mg/L after 15 days of incubation. DTRTA had a mean MIC of 25 mg/L for T. rubrum isolates and 50 mg/L for T. tonsurans isolates after 5 and 15 days of incubation.

DTRTA had MIC over the test range of 25-100 mg/L for molds, after 5 days of incubation, as listed in *Tab. 3*. A mean MIC of DTRTA against S. brevicaulis isolated was 25 mg/L, A. nidulans isolated was 100 mg/L, Aspergillus species was 25 mg/L, Mucor species was 62.5 mg/L, Rhizopus was 50 mg/L, Trichoderma was 100 mg/L, Alternaria species was 100 mg/L, Penicillium species was 58.3 mg/L, Cladosporium species was 75 mg/L, Monilia species was 100 mg/L and Acremonium species was 50 mg/L after 5 days isolates.

The reference *C. albicans* strains had enzymatic activity of 14 enzymes. The highest enzymatic activity had esterase, esterase lipase, leucine and valine arylamidase and N-acetyl-β-glucosaminidase. Exposure to DTRTA inhibited the enzymatic activity of 10 enzymes. Before exposure to DTRTA, *C. albicans* isolates had enzymatic activity of 16 enzymes, after exposure to DTRTA 4 enzymes were inhibited. The highest enzymatic activity had leucine arylamidase, esterase, esterase lipase, α-glucosidase and N-acetyl-β-glucosaminidase (data are not shown).

Significant decrease of the enzymatic activity in 70 *C. albicans* strains was noted among following enzymes: phosphatase alkaline, lipase, tripsin, chymotripsin, phosphatase acid, naphtol-AS-BI-phosphohydrolase, β-glucosidase, N-acetyl-β-glucosamindase, α-mannosidase ($P<0.001$) and esterase, valine arylamidase, α-glucosidae ($p<0.01$) and esterase lipase ($p<0.05$) after exposure of DTRTA (data are not presented).

Before exposure to DTRTA, *non-C. albicans* isolates had enzymatic activity of 13 enzymes, after exposure to DTRTA 8 enzymes were inhibited. The highest enzymatic activity had leucine arylamidase, esterase lipase, phosphatase alkaline and esterase (data are not shown).

Table 1. **MICs DTRTA values against strains *non-Candida albicans* on Sabouraud's and YNB medium**

Number of strains	Sabouraud's medium	YNB medium
Candida krusei n=1	25	25
Candida tropicalis n=2	37.5	18.6
Candida paratropicalis n=1	50	25
Candida glabrata n=1	6.25	3
Rhodotorula rubra n=1	50	25
Candida species n=1	25	12.5
Mean MIC value of total 7 strains non-Candida albicans	33.0 ± 17.2	18.3 ± 9.0

Discussion

In this study, we demonstrated antifungal activity of new benzothiazole derivatives against *C. albicans*, dermatophytes and molds in vitro. Furthermore, *C. albicans* strains used in this study were resistant to several commonly used antimycotics.

In mycological literature there are numerous studies on the resistance of yeast-like fungi to currently used antifungal agents [20-22]. A correlation has been demonstrated between the amount of phospholipase produced and virulence in *C. albicans* strains and other yeast species. Certain fungi such as: Mucor, Rhizopus, Aspergillus, Penicillium and Candida, have the ability of releasing hydrolytic enzymes into environment, which break down multimolecular compounds – polysaccharides, proteins, lipids, hydrocarbons [1].

Our results are in accordance with the previous reports [24-26] Bujadakova et al. assessed anti-Candida activity of 6-amino-2-n-pentylthiobenzothiazole, benzylester of (6-amino-2-benzothiazolylthio) acetic acid and of 3-butylthio-(1,2,4-triazolo)-2,3-benzothiazole. The compounds were active against Candida strains. First compound exhibited inhibitory activity on germ-tube formation and mycelial growth in the *C. albicans* strains, while others were not active in these tests. All the compounds tested were highly active on a nystatin-resistant *C. albicans* strains [24]. Similar findings were also obtained by [25].

Azolium salts and neutral 2-aryl derivatives of benzimid-

Table 2. **MICs DTRTA values against 12 dermatophytes strains on Sabouraud's medium**

Dermatophytes strains	Number of strains	DTRTA	
		MIC (mg/L)	Mean MIC (mg/L)
Reading after 5 days			
Trichophyton mentagrophytes varietas interdigitale	4	12.5	13.3 ± 9
Trichophyton mentagrophytes varietas interdigitale		3	
Trichophyton mentagrophytes varietas interdigitale		25	
Trichophyton mentagrophytes varietas interdigitale		12.5	
Trichophyton mentagrophytes varietas granulosum	4	12.5	10.9 ± 3.1
Trichophyton mentagrophytes varietas granulosum		12.5	
Trichophyton mentagrophytes varietas granulosum		12.5	
Trichophyton mentagrophytes varietas granulosum		6.25	
Epidermophyton floccosum	2	12.5	12,5 ± 0
Epidermophyton floccosum		12.5	
Trichophyton rubrum	1	25	25
Trichophyton tonsurans	1	50	50
Reading after 15 days			
Trichophyton mentagrophytes varietas interdigitale	4	12.5	18.8 ± 7.2
Trichophyton mentagrophytes varietas interdigitale		12.5	
Trichophyton mentagrophytes varietas interdigitale		25	
Trichophyton mentagrophytes varietas interdigitale		25	
Trichophyton mentagrophytes varietas granulosum		25	
Trichophyton mentagrophytes varietas granulosum	4	25	21.9 ± 6.25
Trichophyton mentagrophytes varietas granulosum		25	
Trichophyton mentagrophytes varietas granulosum		12.5	
Epidermophyton floccosum	2	25	25 ± 0
Epidermophyton floccosum		25	
Trichophyton rubrum	1	25	25
Trichophyton tonsurans	1	50	50

Table 3. **MICs DTRTA values against molds strains on Sabouraud's medium**

Molds strains	Number of strains	DTRTA	
		MIC Mg/L	Mean MIC Mg/L
Scopulariopsis brevicaulis	1	25	25±0
Aspergillus species	1	25	25±0
Aspergillus nidulans	2	100	100±0
Aspergillus nidulans		100	
Mucor species	2	25	62.5±53
Mucor species		100	
Rhizopus	2	50	50±0
Rhizopus		50	
Trichoderma	1	100	100±0
Alternaria species	1	100	100±0
Penicillium species	6	100	58.3±34.2
Penicillium species		25	
Penicillium species		50	
Penicillium species		25	
Penicillium species		50	
Penicillium species		100	
Cladosporium species	2	100	75±35.4
Cladosporium species		50	
Monilia sitophila	1	100	100±0
Acremonium species	1	50	50±0

azole, benzothiazole and benzoxazole were synthesized by Cetinkaya et al. [26]. The salts 1 and the neutral compounds 2 were evaluated for their in vitro antimicrobial activity against standard strains: Enterococcus faecalis (ATCC 29212), Staphylococcus aureus (ATCC 29213), Escherichia coli (ATCC 25922), Pseudomonas aeruginosa (ATCC 27853), *C. albicans* and *Candida tropicals*. The compounds 1f, 1g, 1l, 1m, 1n, 2a, 2b, 2c, 2e, 2f showed antimicrobial activity against E. faecalis (ATCC 29212), S. aureus (ATCC 29213), Escherichia coli (ATCC 25922), P. aeruginosa (ATCC 27853), *C. albicans* and *C. tropicals*, with minimum inhibitory concentrations (MICs) ranging between 50 to 200 mg/mL. Compounds 1f, 1g, 1l, 1m, 2b, 2c showed the highest activity. Benzothiazolium and benzoxazolium salts were more active than 1.3-disubstituted benzimidazolium salts and neutral 2-substituted benzimidazole, benzothiazole and benzoxazole derivatives.

In our opinion, the new DTRTA exerts the potent antifungal activity against the yeast-like fungi strains, dermatophytes and molds in vitro.

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The importance of mycological investigations in diagnostics of nail changes

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Abstract

The aim of the study was an analysis of correlation between mycological examination results and clinical features of changed toenails in patients that visited mycological laboratory due to suspected onychomycosis.

Material and methods: Samples of changed toenails were collected from 579 patients. From all that cases a precise patient's history was taken paying a special attention on previous antimycotic treatment. In the clinical examination features of toenail changes were estimated.

Results: Onychomycosis was confirmed by the mycological examination in 23.3% of patients and exclude in 56.3% of individuals. In 20.4% of all cases the fungi growth was not obtained despite of positive results of direct microscopic examination. Among the cultured fungi species the most frequently observed were strains of *Trichophyton rubrum* – 46.6%. 46% of all patients were previously treated with antifungals but the therapy was not efficacious in 23% of them.

Conclusions: In all the cases of toenail changes it is important to take a precise patient's history, because it has an essential influence on the results of diagnostic examinations.

Diagnosing onychomycosis one cannot rely only on the clinical examination because in over 50% of patients with typical for onychomycosis toenail changes the mycological examination do not confirm fungal infection.

Key words: clinical nails disorders, onychomycosis, diagnostics difficulties.

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Introduction

Onychomycosis occurs especially in the elderly. It is connected with extremely slow growth of the nail plates as well as with impaired blood supply to the limbs found more frequently in the elderly [1].

Moreover, different non-mycotic nail lesions are more frequently observed in the elderly. Those lesions may be found in the course of other diseases as well as may be due to different traumas from which the nails are very likely to suffer quite often [2].

Pathological lesions in the nails caused by a mycotic infection may very often resemble the clinical picture of other nail diseases.

For that reason it is vital to confirm a diagnosis of onychomycosis correctly with adequately performed mycological diagnostics before the introduction of antimycotic treatment [3-8].

Contemporary mycological diagnostics includes methods such as:

- nail observation through a magnifying glass,
- direct microscopic examination,
- cultures using standard Sabouraud dextrose agar and Sabouraud medium with the addition of chloramphenicol and actidion,
- microcultures,
- detection and differentiation media: DTM, urease medium and chlamydospore agar,
- carbohydrate and nitric zymograms and auxanograms
- the estimation of drug sensitivity of cultured fungi,
- the examination of enzymatic properties of fungi,
- histopathological examinations.

The very simple, valuable, but not appreciated test allowing to diagnose dermatophyte onychomycosis is nail observation through a magnifying glass in order to find so called "nets". The symptoms of nets, although present in some groups of patients, are of significant diagnostic importance as they are pathognomic for dermatophyte onychomycosis [9]. Consequently, the diagnosis of that disease can be made in those cases where mycological cultures are negative. However, the fungal species responsible

for the infection cannot be determined in such a situation, although it is known that when the symptoms of nets are present the only causative factor for the observed clinical lesions in the nail plates may be dermatophyte.

The aim of the research

The aim of the research was to perform a deepened analysis of the participation of mycological infections in the development of pathological lesions in the toenail plates present in patients who had reported at the mycological laboratory with suspected onychomycosis.

Material and methods

579 patients who had visited the microbiological laboratory either worried by the abnormal appearance of their toenails or with suspected onychomycosis having a referral note from a general practitioner, participated in the research.

The material for mycological examination collected from the nail plates in the case of suspected onychomycosis was every time following collection observed under the microscope in the form of preparations prepared with the reagent containing dimethyl sulfoxide (DMSO) and KOH, and it was cultured on solid Sabouraud media without antibiotics but with actidion and chloramphenicol being selective media. The material for mycological examination in patients with the infection of the nailfolds was collected in a direct way with a sterile loop or a sterile thread saturated with Sabouraud medium was placed under the nailfold for the period of 24 h and then it was placed in a typical way on solid Sabouraud medium.

When fungal growth was present subsequent strain determination was based on the use of additional media such as DTM (Dermatophyte Test Medium), Christensen's medium or chlamydospore agar as well as on developing microcultures which in the case of dermatophytes and moulds most frequently encountered in nails allow to determine their species basing on the micromorphological features. Species determination of fungi from *Candida* genus consisted of developing cultures with Nickerson-Mańkowski medium in order to distinguish *Candida albicans* from other fungi of *Candida* genus marked as *Candida sp.*, which only in some cases were subsequently differentiated using API-20 AUX® test allowing a detailed determination of species belonging to yeast-like fungi in a simple way.

Results

Toenail onychomycosis was confirmed by mycological examination in 23.3% of examined patients as positive results of mycological culture were achieved. In 56.3% of cases negative results of direct mycological examination and culture were achieved despite of twice repeated, consequently, toenail onychomycosis was excluded.

In 20.4% of all examined patients no fungi were cultured despite the detection of fungal strands in direct mycological examination.

***Figure 1*. A proportional participation of patients in the study with previous antifungal treatment**

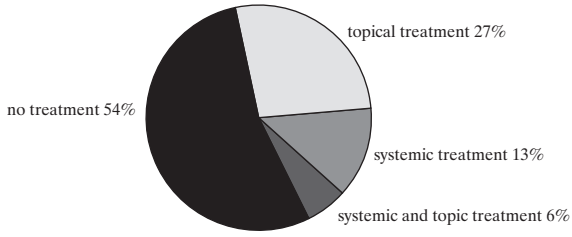
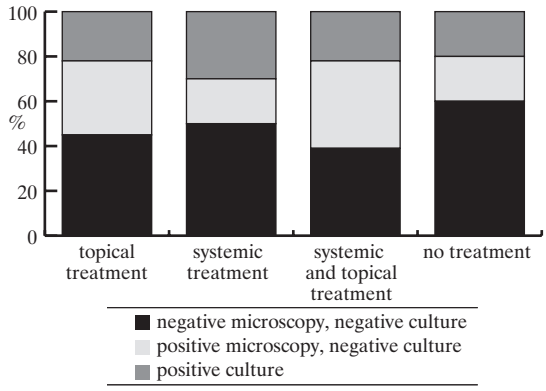


***Figure 2*. Analysis of influence of previous treatment on results of mycological examinations**



Among fungal species which were cultured from the obtained material the following strains were the most frequent: *T. rubrum* – 46.6% (63 cultures), then *T. mentagrophytes*, both in granular and interdigital modification – 21.5% (29 cultures) and *T. tonsurans* – 5.2% (7 cultures), *C. albicans* – 10.4% (14 cultures), *C. species* – 4.4% (6 cultures) and *Scopulariopsis brevicaulis* – 11.9% (16 cultures).

All patients who underwent mycological examination were asked if they had earlier been administered antimycotic therapy (*Fig. 1*).

The patients who admitted having been given antimycotic medicines in the past were asked if mycological diagnostics had been performed before the introduction of that therapy.

It was found that as much as 47% of examined patients had previously been treated with antimycotic therapy, however, some of them had surely been treated ineffectively as they showed positive results of mycological cultures (*Fig. 2*). In subject examination of the toenails in all patients the following were observed: appearance properties of nail changes (*Fig. 3*) and the extent to which they were connected with mycotic and non-mycotic aetiology responsible for their pathological appearance (*Fig. 4*).

Discussion

While analysing the results of mycological examinations it was determined that more than 50% patients who had visited the dermatologist due to toenail lesions did not have onychomycosis. Therefore some appearance properties of abnormal nails such as yellowish discoloration, thickening, subungual keratosis, onycholysis, whitish discoloration, sulcated and friability which

Figure 3. **The analysis of different clinical symptoms occurring in changed toenails**

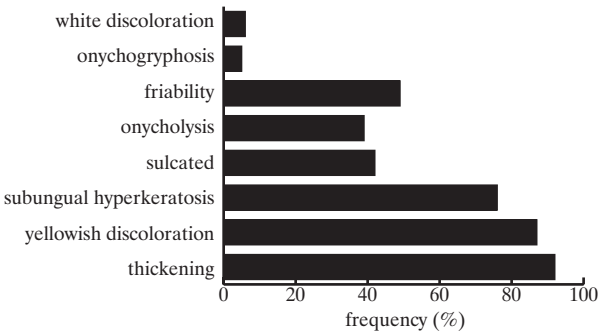
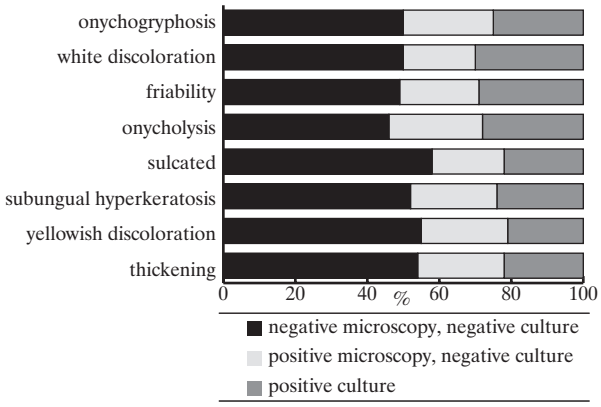


Figure 4. **A proportional participation of different clinical symptoms in changed toenails in patients with and without onychomycosis**



are most frequently connected with onychomycosis in about 50% of cases were related to disturbances of toenail appearance due to non-mycotic aetiology (*Fig. 4*).

What is especially worth emphasizing is that 47% of examined patients had previously been treated with antimycotic therapy and in some of them the treatment had surely been ineffective as they still have positive results of mycological cultures (*Fig. 2*). In the cases where lesions of the nail plates are maintained and currently mycological examinations do not confirm onychomycosis it is impossible to determine in a reliable way if pathogenic fungi had been present before previous treatment. It is due to the fact that fungi frequently colonise the nail plates which had been changed by other pathogenic agents, therefore antimycotic treatment eliminates them from the nails but it hardly changes the clinical picture of the nails [10]. Moreover, it should be remembered that in the patients who had previously been treated negative results of mycological examinations may be the result of the fact that the viability of the fungus weakened due to previous treatment. Such fungi are not able to grow on artificial media although viable fungal strands may be found in deep, hardly accessible nail layers or in keratotic material covering the nail bed under the nail plate. In some of these patients positive results of direct microscopic examinations are found in the material collected from the nails, however, no fungal culture can be obtained.

Other problem connected with frequently seen non-mycotic aetiology of clinical changes in the nails is the interpretation of mycological results in the cases where fungal culture is present. If a dermatophyte is cultured from the nail lesions, there are usually no doubts that it is a pathogenic agent responsible for the nail lesions. However, when yeast-like fungi and moulds are obtained it is not always possible to accept unanimously that these fungi are pathogenic agents responsible for the nail lesions. Whereas when a great number of *Candida albicans* colonies are obtained from the nail material it can generally be accepted that this fungus is a pathogenic agent, however, in other species from *Candida* genus such a statement requires additional confirmation by several cultures of the same fungus from the material collected from the same nail [11]. Moreover, the cultures of moulds obtained from the nail material should also be treated with great caution as they may quite often secondarily grow in the nail plates changed in the course of different diseases. In our geographical conditions only *Scopulariopsis brevicaulis* is responsible for specific clinical changes in the toenails [12]. In the case when the culture of other moulds is obtained the diagnosis of onychomycosis needs also to be confirmed with subsequent mycological examinations.

Conclusions

1. In all cases of the nail changes it is extremely important to perform a detailed insight into patient's history regarding the course of the disease and possible trials of treatment as it may have a significant influence on the results of diagnostic examinations.
2. When a diagnosis of onychomycosis is recognized it cannot exclusively be based on clinical examination as in more than 50% patients with the lesions of the nail plates specific for onychomycosis mycological examination does not confirm mycosis.

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The protein participation in daily diet and nutritional status of medical students in Kraków

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Abstract

Purpose: The assessment of protein participation in daily diet together with anthropometric estimation of nutritional status.

Material and methods: There were examined 150 students of Medical Faculty of Jagiellonian University. BMI and MAMC (Mid Arm Muscle Circumference) were examined in order to estimate the nutritional status. Quality of daily diet was estimated by the analysis of daily nutritional ratio (DNR).

Results: Underweight was more often observed among women (14.3% vs 5.8%), and overweight and obesity among men (13.4% vs 5.1%). Too low MAMC value was more often observed in the group of men (25% vs 2.4%). Correct MAMC value was represented by most women (86%) and with one exception they were also correct among female with underweight. Not acceptable diet showed 62.5% of male students and 46.8% of female students representing all BMI ranges. The low protein consumption frequency in every day diet showed 25% students with MAMC <5 percentile.

Conclusions: The confirmed disturbances in nutrition among examined students did not find statistically important reflection in protein nutritional status represented by MAMC value. It may confirm short time of duration of nutritional disturbances (potential shortages – no physical symptoms) and may be connected with the lack of quantity estimation of nutrition.

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Key words: protein consumption, nutrition mode, daily nutritional ratio.

Introduction

Nutritional habits of schoolchildren and students are the topic of many examinations performed in many scientific centres [1-7]. A big number of works connected with this topic is a precise evidence for the importance and complexity of the problem. The conclusions coming from the observations and examinations are distressing and they indicate that the nutrition (the quantity and the quality) of examined students is incorrect [2,3,6-9]. The increasing disturbances in nutrition mode of young people for some years are: the smaller energetic value of daily nutritional ratio, general decrease in proteins intake and increased intake of animal fats. Too low energetic value of the diet is observed mainly in the female group. The decrease in general proteins intake is accompanied by the increase of animal proteins intake together with low vitamin group B intake. On the other hand too big intake of fats in place of carbohydrates is followed by obesity and many health disturbances [1-3,6,7,9,10]. The results of insufficient energy, nutritional ingredients, vitamins and minerals intake in the reference to the needs of the organism are present especially at the time of increased needs. The increased needs for nutritional ingredients among young healthy people accompany the period of growth and maturity and all other physiological periods requiring positive nitric balance. The measurement of mid arm muscle circumference (MAMC) is one of determinants of protein nutritional status used in anthropometric estimation of nutritional condition. The MAMC below recommended values for specified age, sex and physiological status confirm insufficient protein-energy nutrition and in healthy people reflect the nutritional habits and physical condition. The estimation of protein nutrition of the body seems to be precisely important when incorrect nutritional tendencies showed above are taken into consideration. This is why the initial classification of nutritional status only on the

Table 1. **The quality analysis of daily nutritional ratio (DNR)**

The estimation of DNR	The number of meals	The composition
Satisfactory	4-5	Animal proteins 3x daily and more Vegetables and fruit 2 times and more
Less than satisfactory	3 with additional meals (1-2 additional meals)	Animal proteins 3x daily and more Vegetables and fruit 2 times and more (including vegetable soup and additional meals)
Unsatisfactory	3 and below	Animal protein 2 times daily Vegetables and fruit 1 time daily or not at all

Table 2. **Percentile distribution of MAMC values in dependence on BMI values in accordance with gender of examined persons**

BMI value	Men			Women		
	Percentile distribution of MAMC values					
	<5c [%]	5-95c [%]	>95c [%]	<5c [%]	5-95c [%]	>95c [%]
< 18.5 kg/m^2	3.8	1.9	-	1.2	13.0	-
18.5-24.9 kg/m^2	17.4	63.5	-	1.2	70.0	9.2
≥25 kg/m^2	3.8	9.6	-	-	3.0	2.4
All the group [%]	25*	75	-	2.4	86.0	11.6

* the differences between men and women $p<0.001$

basis of BMI may occur insufficient. In this way the parallel use of some methods for assessment of nutritional status is essential. The analysis of daily nutritional ratio (DNR) allows to pick out the nutritional disturbances before physical symptoms are present and allows to introduce prophylaxis.

The purpose of the study was to make a quality estimation of nutrition precisely taking into consideration the participation of proteins in the daily diet together with defining the real protein-energy nutritional status with the use of the anthropometric measurements.

Material and methods

The examinations were performed among 150 (98 women and 52 men) students of the fourth year of medicine of Collegium Medicum of Jagiellonian University in Cracow. The age of examined persons was 22.2±1.0 year. The level of physical activity of all students was similar (the data from recall). In order to estimate nutritional status the body mass, the height, the arm circumference and the thickness of the triceps skinfold were measured. On the basis of them the BMI and MAMC (Mid Arm Muscle Circumference) were counted. The values of MAMC were qualified according to percentile tables. The values between 5 and 95 percentile were considered as proper [11,12]. The examined persons were divided into 3 groups depending on the BMI values:

I group – underweight students (BMI<18.5 kg/m^2); II group – students with correct BMI (18.5-24.9 kg/m^2); III group – overweight and little obese students (25-31.2 kg/m^2).

Table 3. **The characteristics of daily nutritional ratio (DNR) in the aspect of BMI values in accordance with gender of examined students**

BMI values	Men			Women		
	The estimation of DNR					
	Satisfactory [%]	Less than satisfactory [%]	Unsatisfactory [%]	Satisfactory [%]	Less than satisfactory [%]	Unsatisfactory [%]
<18.5 kg/m^2	33.3	-	66.7	30.7	23.1	46.2
18.5-24.9 kg/m^2	20	10	70	34.7	19.5	45.8
≥25 kg/m^2	80	20	-	40	-	60
All the group [%]	27.1	10.4	62.5	34.3	18.9	46.7

Table 4. **The characteristics of daily nutritional ratio (DNR) to percentile distribution of MAMC in accordance with gender**

Percentile MAMC	Men			Women		
	The estimation of DNR					
	Satisfactory [%]	Less than satisfactory [%]	Unsatisfactory [%]	Satisfactory [%]	Less than satisfactory [%]	Unsatisfactory [%]
<5c	33.3	8.3	58.4	50	50	-
5-95c	25	11.1	63.9	35.1	19.5	45.4
>95c	-	-	-	27.3	9.1	63.6
The total group [%]	27.1	10.4	62.5	34.4	18.9	46.7

Table 5. **The characteristics of animal proteins consumption frequency in every day menu in the aspect of percentile distribution of MAMC in accordance with gender of examined persons**

Percentile distribution of MAMC	Men			Women		
	Animal proteins consumption frequency in every day menu					
	>3 x a day [%]	3 x a day [%]	≥2 x a day [%]	>3 x a day [%]	3 x a day [%]	2 x a day [%]
<5c	41.7	33.3	25	50	50	-
5-95c	27.8	25	47.2	27.3	35	37.7
>95c	-	-	-	-	63.6	36.4
The total group [%]	31.3	27.1	41.6	24.4	38.9	36.7

Because BMI>29.9 kg/m^2 was stated in 3 persons (2 men and 1 women) they were estimated together with the group of overweight students. The analysis of MAMC and quality estimation of nutrition was done in the above mentioned groups. In order to estimate nutrition mode 24-hour recall was used [13]. The data coming from 24-hour recall to analysis of daily nutritional ratio was performed (in accordance with the rules showed in the *Tab. 1*).

The statistical analysis was done with the use of STATISTICA 6.0 PL. The Chi^2 test was used to estimate the presence of differences between the groups of male and female students. The correlation of ranges by Spearman was used to estimate the dependences between BMI and MAMC values.

Results

The correct values of BMI were stated in 80% of female and male students. The underweight was more often present in the female group (14.3% vs 5.8%), but overweight and obesity more often in male group (13.4% vs 5.1%). The expected muscle mass counted on the basis of MAMC is presented in the *Tab. 2*. Too low values of MAMC (<5c) more often were observed in the group of men (25% vs 2.4%). We want to point out that MAMC was correct in 13% of female students showing BMI values <18.5 kg/m^2 what means that there is no threaten of protein malnutrition in these people in spite of too low BMI value.

The conducted analysis of correlation of the ranges by Spearman in the group of men and women shows that the increase of BMI value is parallel with the increase of MAMC ($p<0.001$). The quality estimation of nutrition of medical students in Cracow in reference to nutritional status parameters is presented in the *Tab. 3*,*4*,*5*. 80% of male students and 40% of female students with satisfactory estimation of daily menu showed BMI values characteristic for overnutrition (*Tab. 3*, *Tab. 4*).

The analysis of the number of meals eaten every day showed that 77.1% of men and 73.3% of women used to eat more than 4 meals a day. 21% of students used to eat 3 meals a day. Less than 3 meals a day were eaten by 2.1% of men and 5.5% of women. There were no significant differences stated when the number of meals per day and percentile distribution of MAMC were taking into consideration in both groups.

Only 31.3% of men and 24.4% of women used to eat food proteins more than 3 times a day. The value of MAMC<5c was stated in 41.7% of men and in 50% of women eating proteins more than 3 times a day and in 33.3% of men and 50% of women eating proteins 3 times a day. The female students with MAMC>95c used to eat proteins 3 times a day (63.6%) and 3 times or less a day (36.4%) (*Tab. 5*).

Discussion

In presented work overweight and obesity were more often observed in male students (13.4%) and underweight in female students (14.3%). The similar data come from other authors too [3,4,5]. Overweight stated on the basis of BMI in men could not be identified with bigger muscle mass estimated by MAMC. No one man showed MAMC values >95c. Muscle mass below the recommended values (MAMC<5c) concerned men with a proper value of BMI (17.4%) and overweight men (3.8%). That means that they show too low muscle mass and probably too high fat mass. It confirms incorrect protein-energy nutrition. The value of MAMC<5c more frequently was observed in men group (25%) than in women group (2.4%). It shows that in spite of overweight observed in this group the shortages in muscle mass were more often observed among men. MAMC below recommended values was stated only in one female student (14.3% of girls showed undernutrition). According to presented data low values of BMI in women do not confirm protein malnutrition and MAMC<5c in men shows muscle mass shortages in spite of BMI>25 kg/m^2. The MAMC values reflect the nutrition mode and physical condition of a particular person [11,12]. Animal proteins consumption in every day diet was particularly taken into consideration. Not satisfactory estimation received 62.5% of male students and 46.7% of female students. Low consumption of proteins (≤2 times a day) was stated in 41.6% of men and in 36.7% of women. The similar data concerning low consumption of proteins were observed by other authors too [2-4,6-8].

Our results confirm, that when we only take into account the frequency of particular products consumption we have a view on nutritional habits but we can not make terminal conclusion about protein-energy nutritional status. Nevertheless it is important to know nutritional habits of particular social or age groups because thanks to it we can eliminate potential disturbances before they will be reflected in the nutritional status.

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Challenges in care of adult CF patients – the specialist cystic fibrosis team

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Abstract

Cystic fibrosis (CF) is the most common life-limiting, autosomal, recessive genetic disorder. The gene which is responsible for the symptoms of this disease is located on the long arm of chromosome 7 and encodes the protein called Cystic Fibrosis Transmembrane Conductance Regulator (CFTR), an apical chloride channel in epithelial cells. CF is a "multi-system" disease. It affects many parts of the body and it has a varied clinical expression. All patients with CF should have access to specialist services and the treatment must be comprehensive and multidisciplinary. The multidisciplinary team approach is important when trying to optimize care given to the patient and their family. The cystic fibrosis team may include personnel from the following specialist areas: medical, nursing, physiotherapy, dietetics, psychological, social/supportive. Close coordination is vital. Ideally, 'all members of the team' should have had CF care-related training. The specialist team approach ensures that such specialized multidisciplinary expertise is applied in all aspects of care, better knowledge of individual families, continuity, knowledge of treatment advances and the ability to apply these in daily management. Doubtlessly CF team ensures families a specific point of contact and they know who to talk to.

In 1997 The Department of Pulmonology Diseases in Poznań started running a programme for CF adults at our University – the second CF adult centre in Poland. Members of our CF team have experience in the management of adults who have cystic fibrosis. Its members include physicians, nurses, a physiotherpist, a dietitian, a social worker and a psychologist. We must to build the team approach in CF care and use effectively talents of multiprofessional team members as fully as possible to deliver better services to patients.

Key words: cystic fibrosis, CF team, multidisciplinary approach, adult CF patients.

Cystic fibrosis (CF) is the most common life-limiting, autosomal, recessive genetic disorder in Caucasian populations, particularly those of northern European origin.[1]. The gene which is responsible for the symptoms of this disease is located on the long arm of chromosome 7 and encodes the protein called Cystic Fibrosis Transmembrane Conductance Regulator (CFTR), an apical chloride channel in epithelial cells. Nowadays there are identified over 1000 mutations of the CFTR gene. The mutation of the gene mentioned above causes the pathology of chloride, sodium, potassium and water conductance in and out of cells which changes the composition of secretion in many organs. Normally, these secretions are thin and slippery, but in CF, the defective gene causes secretions to become thick and sticky. Instead of acting as a lubricant, secretions plug up tubes, ducts and passageways, especially in the pancreas and lungs.

CF is a "multi-system" disease which affects many parts of the body and it has a varied clinical expression. In a classic (full-symptoms) presentation it affects the respiratory system (e.g. recurrent and chronic sinusitis, nasal polyposis, chronic bronchopulmonary disease, bronchiolitis, bronchitis, bronchiectasis), the gastrointestinal system (pancreatic insufficiency, recurrent pancreatitis, meconium ileus, the distal intestinal obstruction syndrome (DIOS), rectal prolapse, intussusception, multilobular, biliary liver cirrhosis, cholelithiasis, portal hypertension, oesophageal varices, splenomegaly) the endocrine

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system (diabetes mellitus, delayed pubertal development), the reproductive system (azoospermia caused by congenital bilateral absence of the vas deferens, too thick cervical mucus), the urinary system (incontinence of urine), sweat glands (elevated sweat chloride concentration >60 mEq/l), and many others. Although most of the patients with CF suffer from multi-organ disorders, a respiratory failure is the most common cause of morbidity and mortality.

The progress in therapy and care of people with CF, in the last 50 years, have transformed the prognosis for this group of patients by increasing the median age of survival from less than 1 year to slightly more than 40 years of age [2]. All patients with CF should have access to specialist services, and the treatment must be comprehensive and multidisciplinary. The multidisciplinary team approach is important when trying to optimize care given to the patient and their family as cystic fibrosis is a complex multi-system disorder requiring diverse understanding and knowledge. The advances of the latter are rapid and so treatment protocols change regularly. Moreover, patients and families have a high level of knowledge and growing expectations of their management [3]. The exact staffing levels vary from unit to unit but all of the team members should be experienced in working with cystic fibrosis patients. Based on the strong association between the establishment of comprehensive CF Care Centers and improved patient outcomes, The Cystic Fibrosis Foundation Committee strongly recommends the multidisciplinary approach modeled on the highly successful pediatric CF care system.

The primary objectives of the adult health care team are to: ensure optimum care; facilitate access to pertinent medical resources; coordinate care among specialists and primary care practitioners; support quality of life and independence for each patient. A frequent patient contact with the Center is necessary to accomplish these objectives. In general, quarterly visits are sufficient, although some patients with special needs or an advanced disease may require more frequent attention. The Adult CF Care Team may function in a primary care capacity or in concert with an independent primary care practitioner. Coordination and communication with other medical professionals involved in the patient's care are essential [4].

The cystic fibrosis team may include personnel from the following specialist areas:

1. Medical – primary care physicians, pediatricians, adult physicians (respiratory and gastroenterology), surgeons (ENT, gastroenterology and transplant), gynecologists and obstetricians.

2. Nursing – hospital staff, community nurses, clinical nurse specialists. The important nursing issues include supporting the family and patient from the moment of diagnosis to the terminal stage of the disease; counseling and educational needs of the family and patient, examining the implications of patient's nursing needs during admissions to hospital, outpatient visits and in the community. Caring for the patient with CF can be challenging and gratifying for the nurse. As part of the health care team nurses can do a considerably much to help patients and their parents to overcome their numerous problems [5].

3. Physiotherapy – a specialist respiratory physiotherapist. Physiotherapy is recognized as integral part of the management of patients with CF and is one of the aspects of treatment that contributes to improvement in quality of life. Assessement and reassessement of patients are essential for effective management. Hence each patient should be reviewed by a physiotherapist with an interest in cystic fibrosis at 2-3 monthly intervals, and more often during the first year of diagnosis. Physiotherapy programs must be discussed with and accepted by patients. They also should be realistic to optimaze adherence and obtain a balance between the sufficient treatment and quality of life [6].

4. Dietetics – a specialist dietician. The importance of the nutritional status in the long-term survival of patients with CF is well-documented. Potential nutritional problems are multifactorial, and include maldigestion with subsequent malabsorption, increased requirements and poor dietary intake result in malnutrition. There is a strong indication that improvement in nutritional status leads to an improvement in the prognosis for these patients. The prevention of malnutrition should be a primary goal of the health care team. A regular contact with a dietitian, who can offer simple practical dietary advice will help to prevent a decline in the nutritional status, and may have the added advantage of improving the quality of life and a prognosis for some patients. In addition, supervised nutritional support, either oral, enteral or parenteral, might be actively offered to patients with a severe lung disease, who are struggling to achieve their individual dietary requirements [7].

5. Psychological – child guidance/adult support teams, psychiatrists. Inevitably, the burden of living with any chronic life-limiting disease creates immense stress for the individual and their family. Physical health and psychological health are naturally interdependent and psychological concerns should never be neglected. Some difficulties may require the specialist attention of a psychologist or psychitrist. The importance of establishing a good relationship with the family from the outset cannot be underestimated and can prove valuable when attempting to help at a particular time of the need [8].

6. Social/supportive – social workers, chaplains/religious support, family and friends, administrative staff. The social work brief will inevitably be dictated by prevailing social attitudes, social and economic policies and the legislstive framework that governs health and social care. Supporting people and their carers to live independently in the community makes economic sense and usually provides better opportunities for people to lead more fulfilling lives. The social worker seeks to consider the individual and his carers in order to support their choices, and to act as an advocate for them. Within a specialized clinical framework the social worker is in a unique position to develop an understanding of the needs of people with cystic fibrosis and to convey these to social services' departments and other resource providers in the community [9].

Ideally, 'all members of the team' should have specific training in CF care. Back-up personnel should be available in the event that a team member is unable to perform his or her duties. The pulmonary and GI/nutritional manifestations of the disease predominate in adults as well as in children, but several other issues also emerge. The optimal management of CF requires input from all members of the health care team. Evaluation and intervention by team members should be individualized to suit each patient's conditions. However, the minimum of one comprehensive evaluation per year by each team member is recommended. These evaluations should encompass an assessment of adherence to therapies and the identification of relevant psychosocial issues as well as specific medical issues [20], such as: reviewing the past year's events, examining all aspects of the patient's needs, screening for complications, developing treatment plans for the coming year, ensuring continued patient education. Ideally, the center should organize a case management conference or other in place of it in order to provide for a periodic review of the status of each patient and the formulation of a treatment plan. These assessments should be documented in the medical record and passed on to other health care professionals involved in the care of the patient because close coordination is vital. Many teams are very devolved, but others work better with clear leadership. Individual roles frequently overlap and good communication avoids duplication. The specialist team approach ensures that: specialized multidisciplinary expertise is adopted in all aspects of care; better knowledge of individual families; continuity – especially when team members change; families have a specific point of contact and know who to talk to; knowledge of treatment advances and the ability to apply these in daily management [3].

Regular team meetings are very helpful. It is easier to plan ongoing care for individual patients, assess the impact and effectiveness of current treatment and update on psycho-social issues affecting the patient and their family. When members of CF team meet they may discuss research, new treatment protocols and share their experiences.

Whilst team meetings would normally only include the specialist team, consideration must be given to involving a wider range of team members such as those in related specializations, the community, and other units. It often takes a considerable effort to keep lines of communication open, but such measures can prove invaluable.

In 1997 The Department of Pulmonology Diseases in Poznań started running a programme for CF adults at our University – the second CF adult centre in Poland.

People who receive their care at the accredited CF Center such as The Department of Pulmonology Diseases in Poznań, benefit from access to cutting edge research and development, clinical trials, and a health care team that is dedicated to caring for CF adult patients. It is also essential to distinguish CF from conditions with similar presentations, such as asthma, chronic bronchiectasis, dyskinetic (immotile) cilia, pancreatitis, alfa 1-antitrypsin deficiency, male infertility, or malabsorption. CF diagnostic evaluation may clarify the clinical picture.

Members of our CF team have experience in the management of adults with cystic fibrosis. Adults, generally, have a more severe pulmonary disease, a higher prevalence of DM, and face more complex financial and psychosocial problems. Therefore, a relatively higher intensity of respiratory therapy, and endocrine, nutritional, and psychosocial services may be needed. In addition, adult patients have unique needs, including vocational counseling, contraceptive and reproductive services, and obstetric care. There is a consensus that a multidisciplinary team with training and experience in adult CF care should oversee the care of adults with CF. Our multidisciplinary team consists of physicians with internal medicine training and additional expertise in CF, respiratory physicians, nurses, a dietitian, a physiotherpist, a psychologist and a social worker. Care is provided in inpatient and outpatient facilities.

According to recommendations each patient is seen at our CF Center at least four times a year. Complete nutrition and social work assessment, as well as a full pulmonary function study and chest x-ray is performed annually. Annual laboratory testing of blood and sputum is also part of comprehensive CF care.

Many people are involved in the management of the patient with CF. The patient, parents and relatives must adhere to the actual treatment which has been prescribed by the CF team at hospital. Their understanding of treatment protocols is absolutly essential if the patient and those at home are to be motivated to comply with the treatment advised. The better the patient and relatives understand why a particular treatment is needed, the more efficiently it will be carried out. We aim at teaching the patient and his family as much as possible about the medical aspects of CF and welcome any questions on the "whys and wherefores" of our advice, or on any aspects of the disease.

Within the years of existance of our CF centre we have faced many problems, often caused by the unstable health care system and administrative and financial restrictions. Although there are many areas of treatment where we are reasonably certain that our advice is correct, there are many other areas where there is no proof of efficacy. Last years brought some promising changes, which influenced the functioning of CF centres in Poland. We worked out close cooperation with other departments at University (gynecology, diabetology, anasthesiology, genetics, otorhinolaryngology and palliative care) expanding significantly the number of people interested in CF. We should improve our cooperation with such importent specialists as gastroenterologists, endocrinologists and surgeons. Another very important problem for our centre is difficult access to a lung transplant centre and some of our patients have indications for heart-lung or double-lung transplantation and express their interest in this procedure. The further growth of the centre dependes greatly on the financial security of the health system. Lack of money can be, however, greatly compensated by the devotion and growing expertise of people involved in CF care.

We must develop the team approach in CF care using the talents of a multiprofessional team as fully as possible in order to provide patients with better services which is a primary challenge for us.

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Hand dermatitis: a problem commonly affecting nurses

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Abstract

Hand dermatitis is regarded as one of the most often observed dermatological disorders among nurses. The factors that increase the risk of developing hand dermatitis are as follows: frequent washing hands, using disinfectants, wet-work conditions, exposure to medical substances, detergents and wearing rubber gloves. Most cases of occupational hand dermatitis is due to chronic exposure to irritants that cause the inflammation on the nonallergic pathway. Recurring contact to irritants disturbes the natural skin barrier and causes inflammation. There are reports showing the presence of skin barrier alterations among nurses working in operating room units. The most common contact allergens in the hospital environment include rubber, latex, medicaments and antiseptic products. In our study the incidence of self-reported hand dermatitis in hospital staff was very high. About 70% of respondents declared the presence of symptoms of hand eczema within the last 12 months and about 46% of the studied group had skin lesions at the moment of self-examination. Almost 75% of employees with hand dermatitis had observed the worsening of skin problems in relation to work and 79% reported improvement of skin changes during the leisure time. We also noted that a personal or family history of atopy increases the risk of developing hand dermatitis in nurses. We would also like to emphasize the psychological consequencies that affect nurses with hand dermatitis. According to our data 48% of hospital employees with hand eczema declare psychological distress caused by their skin lesions.

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Key words: hand dermatitis, nurses, predisposing factors, psychological distress.

Introduction

Hand dermatitis is regarded as one of the most often observed dermatological disorders among hospital staff [1-4]. This is mainly due to the frequent contact with irritant and/or allergenic substances that occurs during the work. The factors that increase the risk of developing hand dermatitis are as follows: frequent washing hands, using disinfectants, wet-work conditions, exposure to medical substances, detergents and wearing rubber gloves. Hand dermatitis which is usually diagnosed as contact dermatitis, is very common among nurses worldwide. Its prevalence in this population is assessed on about 10-48% [1-6] and depends on specificity of the hospital department. Hand dermatitis especially frequently affects nurses working on surgical, internal medicine, geriatric, obstetric or pediatric wards [6,7]. Recently conducted studies have shown the correlation between the incidence of hand dermatitis in hospital staff and frequency of hand washing and using soap, detergents and disinfectants [6,8-11].

Pathogenesis of contact dermatitis

Concerning the pathogenesis, contact dermatitis may be divided into two groups: allergic and irritant contact dermatitis. Most cases of occupational hand dermatitis is due to chronic exposure to irritants that cause the inflammation on the nonallergic pathway.

Irritant contact dermatitis

In this condition skin changes, usually of the chronic and recurrent course, develope as the result of frequent exposure to factors causing irritation or skin dryness, which lead to disfunction of natural skin barrier [12]. Recurring contact to irritants

Table 1. **Self-reported hand dermatitis in hospital staff**

Skin lesions		Number	Percentage (%)
Occurrence	within last 12 months	181	69.6
	on self-examination	120	46.2
Type	redness	162	89.5
	roughness	162	89.5
	fissures	46	25.4
	vesicles	20	11.0
	itching	57	31.5
Location	single	114	63.0
	multiple	67	37.0
	dorsum of the hand	116	64.0
	palmar surface	59	32.6
	lateral sites of fingers	45	24.8
	pulps of fingers	21	11.6
	around nail folds	28	15.5
Relation to work	worsening	136	75.2
	no change	45	24.8
Relation to leisure	improvement	143	79.0
time	no change	38	21.0
Psychological	yes	87	48.1
distress	no	94	51.9

disturbes the natural defense mechanisms of the skin and causes inflammation. Skin changes do not develop in every person exposed to the irritant factors and the severity of the lesions also differs in various patients. The course of the disease depends on the effectiveness of skin barrier (pH of the skin, the ability of water biding in the stratum corneum and lipid cover of the skin) and on the individual factors [12]. The decreased level of skin lipids or the disturbed lipid proportion in the epidermis lead to water binding impairment and facilitate the penetration of harmful substances. Frequent hand washing and exposure to detergents causes the damage of natural lipid layer of the skin which leads to xerosis and increased susceptibility to damaging factors. There are reports showing the presence of skin barrier alterations among nurses working in operating room units [12]. In the comparison with the control group transepidermal water loss (TEWL) was significantly higher, while stratum corneum hydration was significantly lower in examined nurses.

The severity of irritant contact dermatitis depends on the length and frequency of exposure to damaging factors and on the dose of irritant substances. After stopping the exposure the symptoms usually improve or dissapear. Skin lesions are limited only to the exposed skin areas.

Allergic contact dermatitis

The most common contact allergens in the hospital environment are rubber, latex, medicaments and antiseptic products [11]. Contact dermatitis is a IV type of allergy. The pathogenesis of this disease is biphasic. In the first phase (induction) the skin is penetrated by small particules called haptens. Haptens combine with proteins and become allergens. These antigens are phagocytosised by Langerhans cells and presented to lymphocytes T. Lymphocytes proliferate and create the specifically sensitized memory cells. In the second phase, after the repeated contact with the antigen, memory cells initiate the inflammatory reactions. The crucial for the developing skin lesions are Th1 lymphocytes and their cytokines. They activate inflammatory cells, increase proliferation of other lymphocytes and antigen presenting cells and influence many other proinflammatory processes.

The severity of allergic contact dermatitis does not depend on the dose of allergenic substance nor on the length of exposure. Even the short contact with antigen activates the lymphocytic memory cells and leads to developing the inflammatory process. Cessation of that exposure does not lead to immediate improvement because further phases of the allergic inflammation develop without direct influence of the antigen. Moreover, a few days after the exposure to allergenic substances the skin lesions may even worsen and may appear on the not exposed skin areas.

Occupational hand dermatitis may initiate as irritant contact dermatitis and further develop to allergic dermatitis. Skin barrier alterations due to irritation facilitate the penetration of allergenic substances into the skin which lead to induction of IV type allergic reactions.

Own experience

Our group has been interested in the problem of hand dermatitis in hospital staff for a few last years. Recently we have published a study regarding this problem [13]. The 260 hospital employees were included into this study (mostly nurses). Among this group there were 245 females and 15 males aged 21-55 years with a mean of 37.4 years. The job seniority ranged from 0.5 to 38 years (mean 13 years). The majority of nurses worked in surgical or internal departments. The data were analyzed statistically with Chi^2 test and Mann-Whitney U-test. The incidence of self-reported hand dermatitis in our survey was very high. About 70% of respondents declared the presence of symptoms of hand eczema within the last 12 months and about 46% of the studied group had skin lesions at the moment of self-examination. This is a very high propotion which is simmilar to the reports from other countries or even higher [1-6]. The most frequent skin changes were redness and rough skin (89.5%). Other observed symptoms included: itching (31.5%), fissures (25.4%), and the most seldom reported vesicles (11%). Although the most frequent location of lesions was dorsum of hands (64%), 37% of respondents with hand dermatitis had several affected sites on the hands. The symptoms were strictly associated with work, only 3.5% of the respondents claimed that the skin changes had appeared before they started to practice their present professions. Almost 75% of employees with hand dermatitis observed the worsening of skin problems in relation to work and 79% reported improvement of skin changes during the leisure time. The detailed results are summarized in *Tab. 1*.

There are many suggestions regarding the predisposing

factors to hand eczema in hospital staff. Several studies showed that usage of rubber gloves, detergents, disinfectants or wet-work conditions may predispose to hand dermatitis [3,10,11]. In our study [13] the influence of neither of the above mentioned factors was confirmed statistically. However, we indicated that a personal or family history of atopy increases the risk of developing hand dermatitis in nurses. Hand eczema was reported more frequently in hospital employees with allergic rhinitis ($p<0.0001$) and people with allergic conjunctivitis ($p<0.001$). Skin lesions were also significantly more often present in patients with family history of these diseases ($p<0.002$ and $p<0.001$) and in patients with positive family history of atopic dermatitis ($p=0.02$). Thus, based on the above described results, we are pointing out the importance of atopy as an additional predisposing factor to hand dermatitis. This is in agreement with other reports [4,5]. Patients with atopic dermatitis suffer from excessive skin dryness. The level of urea and ceramides in the epidermis of atopic patients is decreased. Thus the skin barrier is disturbed which leads to better skin penetration by damaging substances.

These results suggest that the problem of hand dermatitis in nurses is really of great importance. The skin lesions may hamper professional duties and may be the reason of prolonged absences [1,2]. We would also like to emphasize the psychological consequencies that affect nurses with hand dermatitis. According to our data 48% of hospital employees with hand eczema declare psychological distress caused by their skin lesions [14]. The patients feel embarrassment or irritability due to the skin changes, which disturb both social and professional aspects of life. The level of psychological distress depended on the severity of the disease. Symptoms of hand dermatitis in patients who reported the distress were significantly more severe than in those without psychological problems ($p=0.0016$). The average number of years in the job was also significantly higher in these subjects ($p=0.01$).

Conclusions

Hand dermatitis is a serious clinical problem in the population of nurses. It seems to be of great importance to introduce educational programmes to clarify the predisposing factors and to introduce prophylactic procedures (wearing of gloves, reducing of washing the hands with detergents and soaps, usage of repary hand creams).

Acknowledgments

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Role of psychological factors in course of the rosacea

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Abstract

Purpose: 1 – Investigation of dependence between first symptoms of the rosacea and with surviving of critical life events. 2 – Describe of the dissimilarity in intensity of the stress at illness and healthy. 3 – Estimation of impact of stressful situations for escalating of changes in course of the disease. 4 – Comparison of the subjective estimation of patients' health.

Material and methods: 40 persons with rosacea, in the age of 25-75 years, were examined and 40 healthy volunteers, matched to the sex, age, social-economic background. The Holms' and Rahes' modified Social Readjustment Rating Scale questionnaire was applied and the WZS questionnaire by Sęk and Szaładziński.

Results: Investigations showed dissimilarities of events met in the number and intensity of the stress between sick people and volunteers. Symptoms of the acne are escalating as a result of caused emotions with primary evaluation. The image of the subjective estimation of patients' health is showing their motivation to recover.

Conclusions: 1 – Patients with rosacea in the period before the occurring of first symptoms of the disease, comparatively with persons from the control group, they experienced the bigger number of critical life events. 2 – The stress intensity resulting from the number of critical life events, is significantly higher at sick people in the relation to the control group. 3 – At patients with rosacea emotions resulting of the estimation of the primary stressful situation tightening symptoms of the disease. 4 – The subjective estimation of patients' health is essential predicate of psychodermatological therapy releasing potential health possibilities at the patient.

Key words: rosacea, critical life events, stress, stressful situations.

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Introduction

Rosacea is a common dermatologic disorder that is located on the face. There is a large variety of visible skin changes, which change from hardly visible to very burdensome. The first symptoms of rosacea are flushing, persistent central facial erythema. With time the flushing stays there permanently, a lot of telangiectasias and central facial papules and pustules are becoming apparent, and then we can see irregular surface nodularities, rhinophyma, cutaneous signs and symptoms located on forehead, cheeks and chin [1-3].

Patients with this problem take their illness as a cosmetic problem rather then a real disease. The outward appearance is very important for them, as everyone has a picture of their own body in the mind. It is more than attractiveness or beauty. This mind picture image of ourselves brings emotions, takes effect on our behaviour and self-opinion, takes control of our plans, decides what sort of people we choose to meet and if we are happy in life [5].

Etiology of rosacea is still unexplained. In the literature we read: genetic predisposition, psychic basis, hormonal imbalance, autonomous nervous system hyperexcitability, diseases of the digestive system, facial seborrhoea based, infections, and immune based disorder. The stress is also very important for the development of the disease. Nowadays more and more of the researchers will put this dermatological entity, to the group of diseases with psychoimmunoligical basis. That's why the diagnostic-therapeutic cooperation is very important between doctors and psychologists.

The aim of the research

The main purpose of work was evaluation of chosen factors of aetiology of rosacea in the light of their effects on aggravation (exacerbation) of the symptoms of the disease, so the main tasks were:

1. examination if the patients in the time preceding the first symptoms of rosacea, had any critical life events (CLE);
2. defining the difference between the depth of the stress under the critical life events in patients with rosacea with patients in the control group;
3. showing the dependencies between the subjective opinion of the stressful situations and aggravation of the clinical changes in the course of the rosacea in the studied patients;
4. comparison of the subjective estimation of patients' health in the different age groups.

Material and methods

40 persons with the disease have taken part in the research. There were 29 women (72.5%) and 11 men (27.5%) aged from 25 to 75 years old. The average age for men was 53.1 years, for women it was 49.4 years. There was also a control group of 40 healthy volunteers matched to sex, age, social-economic background.

On the basis of clinical research and classification of rosacea done by Expert Committee National Rosacea Society (NRS) the patients with rosacea were divided into 5 groups, depending on the clinical character of the illness (*Fig. 1*). The patients with rosacea and the people from the control group were examined in 3 age groups: early adulthood (from 25 to 35 y. o.), middle adulthood (from 36 to 55 y. o. for women and from 36 to 60 y. o. for men) and late adulthood (from 56 y. o. for women and from 60 y. o. for men).

In the research 4 types of factors were taken: sociodemographic elements, critical life events, primary evaluation and subjective estimation of health.

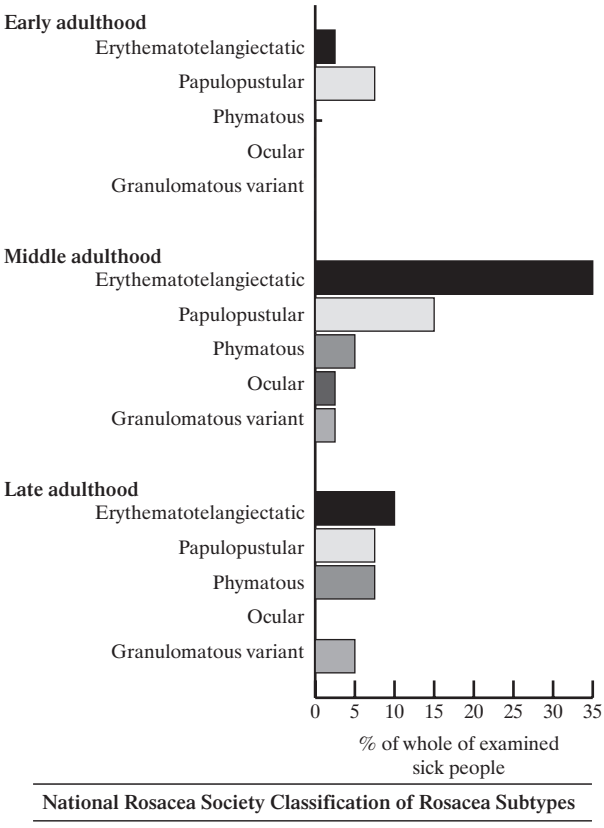
In the group of sociodemographic elements the following factors were taken: sex, age, marital status, education, occupation and income source.

In the group of critical life events 2 measures were taken. First one was the number of the critical events, which the subject experienced in the time between 6 months and 2 years (before the first symptoms of illness in the patients group and before the research in the control group). The second measure was the level of stress received with the events. The person was estimating the level of stress in each event on a 5 point scale. The index was the average of these levels.

The primary evaluation is the opinion in the following categories: challenge, danger and loss – proposed by Lazarus. [9-11]. It is an inside process, allowing recognition of the surrounding reality and describing the important things for the subject. The primary evaluation is an essential condition for showing emotion. With loss the following are connected: anger, sorrow, sadness, worrying.

The emotional picture of challenge is the most complicated and covers both negative emotions, similar to the ones accompanying danger, and positive ones – hope, enthusiasm, excitement [11].

Figure 1. **Dermatological profile of patients with the Rosacea**



The measures of trends to perceive stressors in these categories are the results of the questionnaire WZS (challenge, danger and loss). The subjects have rated their reactions to stress in 12 seven-point scales. Testing positions are in the three further scales. The outcome is the sum of results of all the testing positions connected with the type of primary evaluation. The higher result, the higher tendency to rate the particular type.

In the category subjective estimation of health the following belong: quantification (as a percentage) of health and illness, where the total for both measures of somatic state of patient is 100% [13-16].

The basis for construction of the list of life events was the Holms' and Rahes' Social Readjustment Rating Scale questionnaire modified by Pasikowski. The list contains 39 different events. The 40th position was left blank for the patient to write their own event not included in the list. Additionally the subjects were asked to estimate the stress level connected with these events, which they have chosen from the 40 possible ones. The rating was done in a 5 point scale, starting from 1 (minimum stress) to 5 (maximum stress) [8,17].

The WZS questionnaire was created by Sek and Szaladzinski. It is used to measure the tendency to see stressful situations as challenge, danger and loss. The theoretic basis of this method is transactional conception of stress by Lazarus. The subject rates the first reaction in stressful situations by marking a point

Figure 2. **Comparing the number of critital life events at patients with the rosacea and in the control group**

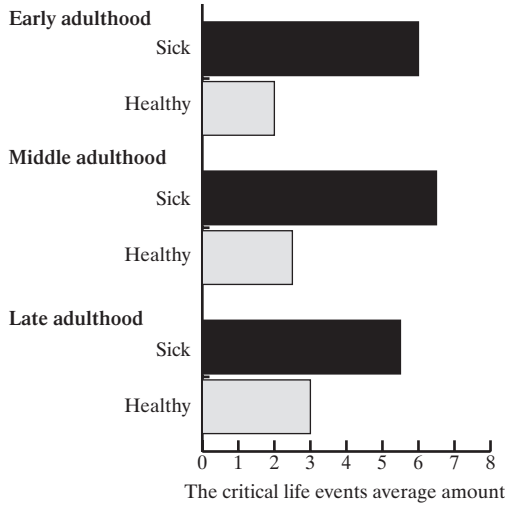
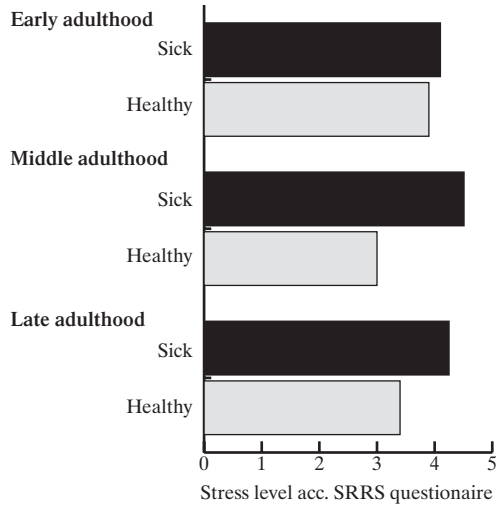


Figure 3. **Comparing the level of the stress at patients with the rosacea and in the control group**



on each of the 12 scales. The results in each of the further scale (three of them) of the questionnaire are calculated separately by summing the scores in appropriate points by the means of keys.

In the questionnaire, especially created for the purpose of this research, there were questions, which were to obtain information about the demographic and sociologic elements.

The last part of the questionnaire contained projection questions to subjects to make a subjective estimation of health in the progress of rosacea. With available 100% for measures: health – illness, the subject rated in what percentage he was ill or healthy. The chosen percentage of health is a measure of the subjective estimation of own biopsychophysical state and it shows motivation for treatment.

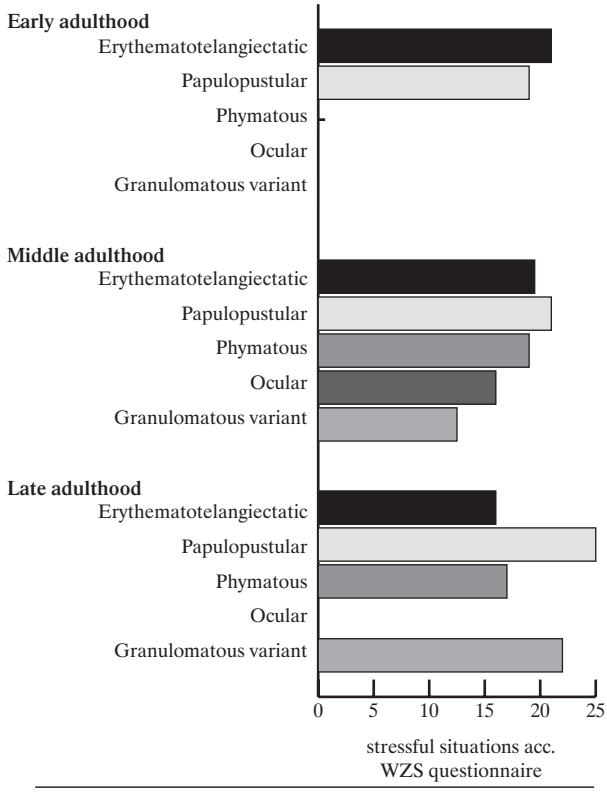
Results and comments

From the data shown on *Fig. 2* we can see that the number of critical life events at the patients with rosacea in the ages of early, mid and late adulthood is higher than in the control group in the same age groups.

The level of stress in the critical life events at the patients in the first age group (early adulthood) is high (average 3.0), but in the healthy people it is mostly placed just below this value, showing that in this phase of life a human being is subjected to most of life's stressful situations. In middle and late adulthood the level of stress under critical life events is higher in the ill patients than in the healthy ones, for whose the level of stress is around the average value. The completion of progress tasks in these times is conditioned by the changes on the family, career and hormonal changes for the middle adulthood and for the late adulthood by biological changes in the body and the process of getting old (*Fig. 3*).

The symptoms of rosacea were getting worse in the stressful situations as a result of emotional picture of primary evaluation of type (*Fig. 4*,*5*,*6*):

Figure 4. **Comparison of stressful of primary estimation at the "challenge" type patients between gruops with each rosacea subtypes**



National Rosacea Society Classification of Rosacea Subtypes

- "challenge" (average value – 19.0) in the early adulthood for the erythematotelangiectatic form; in the middle adulthood for the following forms: papulopustular, erythematotelangiectatic and phymatous; in the late adulthood for forms: papulopustular, and granulomatous variant of rosacea

Figure 5. **Comparison of stressful of primary estimation at the "danger" type patients between groups with each rosacea subtypes**

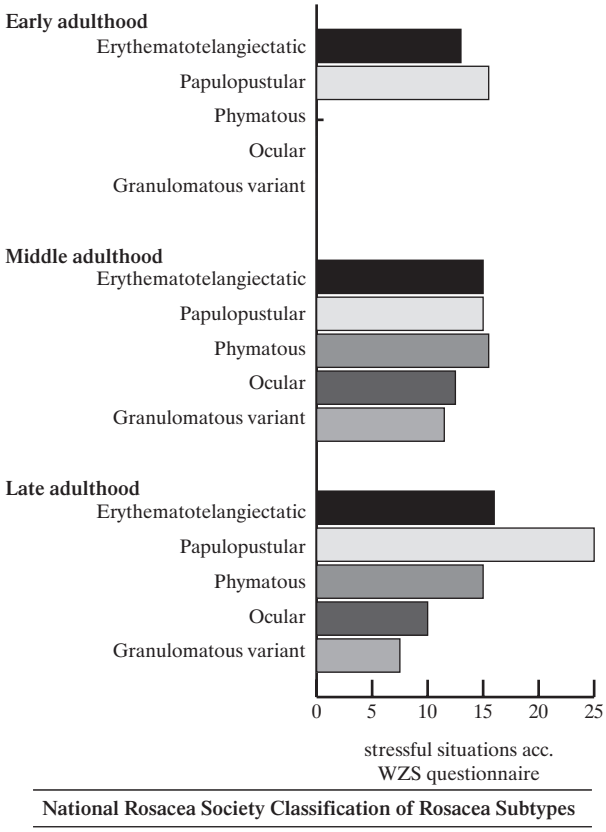
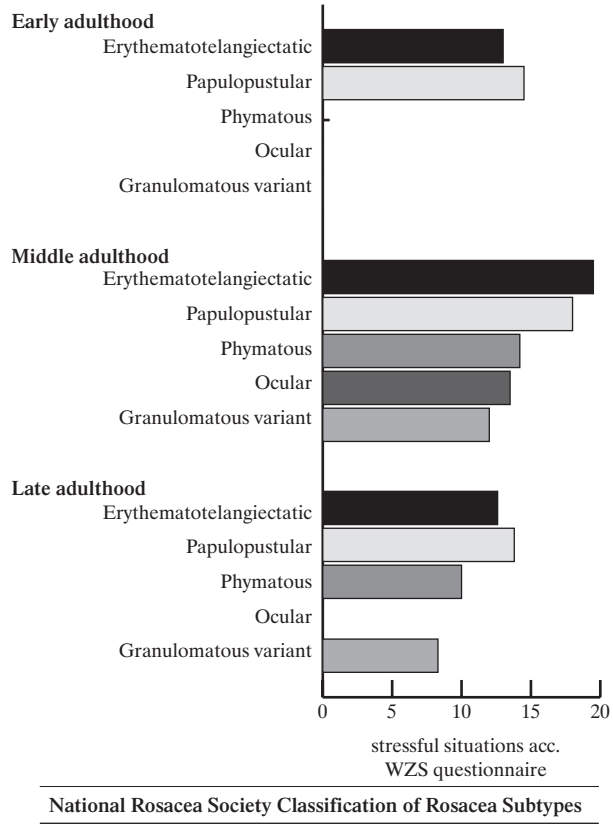


Figure 6. **Comparison of stressful of primary estimation at the "loss" type patients between groups with each rosacea subtypes**



- "danger" (average value – 13.0) in the early adulthood for the papulopustular form; in the middle adulthood for the following forms: papulopustular, erythematotelangiectatic and phymatous; in the late adulthood for erythematotelangiectatic form
- "loss" (average value – 13.0) in the early adulthood for the papulopustular form; in the middle adulthood for the following forms: papulopustular, erythematotelangiectatic and phymatous; in the late adulthood for papulopustular form.

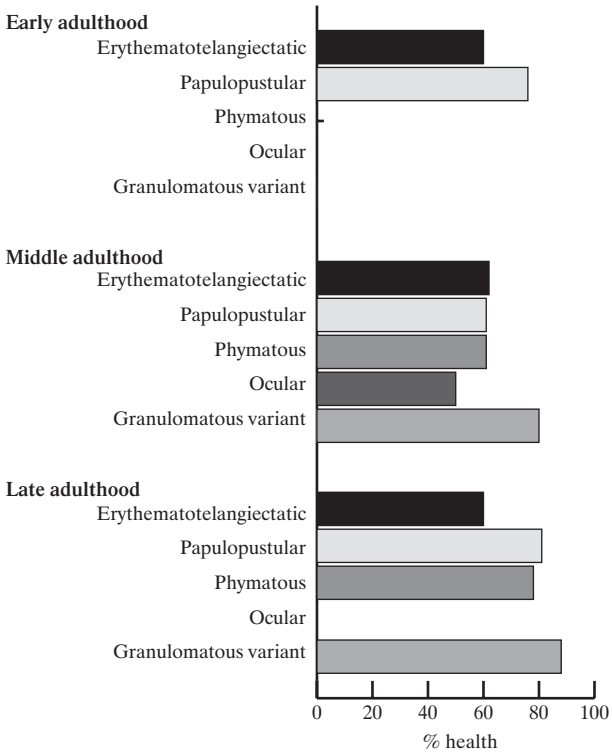
Visually data of the subjective health estimate of the patients with rosacea shows that the subjects in all age groups can see a large potential of somatic health (*Fig. 7*). The greatest percentage of the subjective health in the ill people have the ones from the late adulthood group for the granulomatous variant, and the papulopustular form of rosacea; slightly smaller for the phymatous type and the lowest (60% of health) for the erythematotelangiectatic form. In the remaining development stages (early and middle adulthood) the subjective estimate of health in the patients with rosacea is similar. Comparing to late adulthood, the patients are less content from their potential health prospects. But still these values are high. The patients with granulomatous variant of rosacea have the highest measure of subjective health in the middle adulthood (80%). The types papulopustular and phymatous have the lower values (60-62.5% of health). The low value (50% of health) characterises the ocular type of rosacea. In the early adulthood the subjective health estimation has the highest value (76.8%) for the papulopustular type and for the erythematotelangiectatic type the value is 60%.

The above data shows that the human being in an illness, which is a difficult situation, is not helpless. He has resources that motivate him to a long-term therapy. The results are important for the psychologist, as they show the area of patient's health where the psychological help is needed. It should be done in the form of therapy that will activate the potential health possibilities in the patient.

Conclusions

1. Patients with rosacea in the period before the occurring of first symptoms of the disease, comparatively with persons from the control group, have experienced the bigger number of critical life events in the middle adulthood.
2. The stress intensity resulting from the number of critical life events, is significantly higher at sick people in the relation to the control group.
3. At patients with rosacea emotions resulting of the estimation of the primary stressful situation of types "challenge", "danger" and "loss" causes tightening symptoms of the disease.

***Figure* 7. Subjective estimation of health between patients' groups with each subtypes of the rosacea**



4. The subjective estimation of patients' health is essential predicate of psychodermatological therapy releasing potential health possibilities in the patient.

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Body weight gain as the major risk factor of cholelithiasis in women and an important risk factor in man

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Abstract

Purpose: **The power of correlation was assessed between chosen risk factors of cholelithiasis in order to establish the ranking of these factors in Podlasie inhabitants.**

Material and methods: **The study involved 169 patients hospitalized due to cholelithiasis (study group) and 202 patients without cholelithiasis (control group). Previous exposure of patients of both groups to the chosen risk factors of cholelithiasis was evaluated (based on a history questionnaire designed by the authors of the study). Two models of logistic regression were prepared (for men and women) for multivariate analysis.**

Results: **The ranking of the risk factors of cholelithiasis was established by analysing multiple correlation coefficients for the two models of logistic regression and their significance was determined with Wald's test. The significant risk factors for women included: overweight and obesity, age, diabetes, use of contraceptive pills, while for men these were: age, serum triglycerol level, obesity.**

Conclusions: **The knowledge of risk factors of cholelithiasis in our population is the essence of health promoting actions. Obesity is the major risk factor in women and statistically significant in men. Promotion of appropriate eating habits can result in body mass reduction and may thus indirectly decrease other risk factors of cholelithiasis (incidence of type II diabetes and serum triglycerol level).**

Key words: cholelithiasis, obesity, risk factors, adults.

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Introduction

Cholelithiasis belongs to the most common diseases of the digestive system and its incidence is growing steadily. It is assumed that in Poland over 11.0% of the whole population suffer from this ailment [1]. However, there is a lack of population surveys and therefore epidemiological data seem to be incomplete. Studies performed in work institutions have contributed to the determination of the cross-sectional prevalence of the disease in the occupationally active group (aged 18-70 years) of inhabitants in the south of Poland. Cholelithiasis was found there in approximately 12.0% of patients (17.36% women and 6.41% men) [2]. In Szczecin, cholelithiasis was diagnosed in 17.33% of women working in industrial plants (aged 20-69) [3], the percentage of women with concretions in the gallbladder being 1.66% for the age of 20-29 and 35.29% for 60-69 years.

Studies on cholelithiasis tend to identify risk factors, being of great value for effective prevention. It is assumed that gallstone formation is associated with a combination of genetic and environmental factors, i.e. female gender, positive family history, hyperlipidaemia, obesity, age, number of labours and abortions, type I and II diabetes, diseases of the colon, use of hormonal contraceptives, some of the gastrointestinal tract disorders (e.g. malabsorption syndrome, polycystic fibrosis of the pancreas with excretory failure, diseases impairing functioning of the gallbladder and others) [4-8]. The aim of the present study was to determine mutual correlations of chosen risk factors of cholelithiasis in the population of patients from Podlasie and in consequence to establish more effective measures of the disease prevention and health promoting attitudes.

Material and methods

Risk factors of cholelithiasis were retrospectively assessed using a history questionnaire form (designed by the authors of the study). The study involved 169 patients hospitalized in III Department of Internal Diseases and Gastroenterology of

Table 1. **Model I of logistic regression for women n=227**

Variables	Regression coefficient	Wald's test
1. Age	0.0475	0.0001
2. Body mass index (BMI)	0.1592	0.0000
3. Education	0.0532	0.8468
4. Type of leisure	-0.7385	0.0899
5. Diabetes	1.1963	0.0343
6. Cholelithiasis positive family history	0.0032	0.9944
7. Diabetes positive family history	0.9386	0.0380
8. Use of contraceptive pills	-1.8693	0.0123
9. Number of labours and abortions	-0.2946	0.0760
10. Use of cholesterol-reduction drugs	0.5227	0.5069
11. Level of serum triglycerols (TG)	0.5581	0.0854
12. Total cholesterol	0.2074	0.5359
13. HDL-cholesterol	0.2708	0.4328
Constant	-7.0165	0.0140

Table 2. **Model II of logistic regression for men n=144**

Variables	Regression coefficient	Wald's test
1. Age	0.0477	0.0014
2. Body mass index (BMI)	0.0980	0.0276
3. Education	-0.2468	0.3818
4. Type of leisure	-0.7355	0.0955
5. Diabetes	0.3430	0.5821
6. Cholelithiasis positive family history	0.2142	0.6922
7. Diabetes positive family history	0.9404	0.1489
8. Use of cholesterol-reduction drugs	-0.2944	0.6843
9. Level of serum triglycerols (TG)	1.1598	0.0048
10. Total cholesterol	-0.0347	0.9340
11. HDL-cholesterol	-0.0081	0.9861
Constant	-6.5978	0.0152

The District General Hospital in Białystok, with cholelithiasis diagnosed based on clinical observations, ultrasound of the abdominal cavity and/or endoscopic retrograde pancreatocholangiography (group I). Control group included 202 cholelithiasis-free patients treated in the same department, who were selected by stratified randomisation method. Efforts were taken to match the patients of both groups for age, gender and the place of living.

Multivariate logistic regression analysis was employed to identify the factors that significantly increase the risk of cholelithiasis. Two separate models of logistic regression were designed to assess the risk factors according to gender (model I – 13 factors, for women and model II – 11 factors, for men). Model I contained the following risk factors: age, body mass index (BMI), education, type of leisure, diabetes, cholelithiasis and/or diabetes positive family history, use of contraceptive pills, number of labours and abortions, use of cholesterol-reducing drugs, level of serum triglycerols (TG), total cholesterol and HDL-cholesterol. Model II consisted of the same risk factors except for hormonal contraception and number of labours and abortions. The models were assessed statistically using SPSS package for Windows Release 6.0. Significance of the respective factors was tested with bilateral Wald's test, with p values<0.05 considered to be significant. Then, based on the 2x2 table (four-field) sensitivity, specificity and predicted accuracy of the method were determined. The category of predicted cholelithiasis was identified when the calculated probability equalled 0.5 (pg=0.5). The calculated power of correlation between logistic regression coefficients of the respective risk factors was used to establish their ranking.

Results

The study involved 169 cholelithiasis patients (109 women and 60 men) aged 23-91 years (mean – 63.8 years) and 202 cholelithiasis-free patients (118 women and 84 men) aged 19-90 years (mean – 55.6 years). The majority of patients (75.2% women and 81.7% of men) lived in town, the remaining patients inhabited the adjacent villages.

Model I of logistic regression, presented in *Tab. 1*, was designed to determine mutual correlations between the investigated risk factors of cholelithiasis in women. 227 women were recruited (109 with and 118 without cholelithiasis) and 13 risk factors were investigated. Such parameters as overweight and obesity, age, diabetes (family history of diabetes was on the border of significance p=0.0621) and the use of hormonal contraceptives appeared to be the significant prognostic factors of cholelithiasis in women. The method sensitivity, specificity and predicted accuracy were calculated for 5 of the risk factors, being 71.6%, 71.2% and 71.4%, respectively.

A similar model of logistic regression was designed for 144 men (60 with cholelithiasis and 84 without). Eleven risk factors were assessed (excluding 2 typical for women i.e. contraception and labours). The results are presented in *Tab. 2*. The significant prognostic factors in men were (depending on the correlation power): age, current serum TG level and high BMI. The method sensitivity, specificity and predicted accuracy were calculated for these three factors, being 58.3%, 78.6% and 70.1%, respectively.

The analysis of multiple correlation coefficients of the two logistic regression models and Wald's test revealed the following order of risk factors:

• Women – statistically significant factors: 1. overweight and obesity, 2. age, 3. diabetes, 4. use of contraceptive pills – close to statistical significance, 5. positive family history of diabetes, 6. number of labours and abortions, 7. serum TG, 8. type of leisure; and statistically insignificant factors, 9. serum HDL-cholesterol, 10. use of cholesterol-reducing drugs, 11. serum total cholesterol, 12. education, 13. positive family history of cholelithiasis.

• Men – statististically significant factors: 1. age, 2. serum TG, 3. obesity, close to statistical significance: 4. type of leisure; and statistically insignificant factors: positive family history of diabetes, 6. education, 7. diabetes, 8. use of cholesterol-reducing drugs, 9. positive family history of cholelithiasis, 10. serum total cholesterol, 11. serum HDL-cholesterol.

Discussion

Cholelithiasis has been long known to be a multifactorial disease and to have higher incidence among women. Many authors have assessed correlations of risk factors of cholelithiasis using multifactorial analysis with logistic regression based on models designed for males and females [9,10]. In one of such studies, age, gender, active hepatitis, obesity, hyperlipidemia and diabetes were analysed [11]. Age and diabetes turned out to be statistically significant risk factors of cholelithiasis in both genders. In another study, carried out on patients aged 20-74 [12], the significant factors included: in men – age, education, subscapular fold thickness, high HDL-cholesterol level; in women – age, BMI, skin fold thickness, diabetes, glucose tolerance disorders and oral contraceptives. Alcohol intake had no significant effect on the incidence of cholelithiasis in both genders. Similar findings were obtained in the present study. High BMI, concomitant diabetes, use of contraceptive pills and positive family history of diabetes were the prognostic factors of cholelithiasis (predicted accuracy 71.4%). In an American study performed on 425 women under 45 years of age [9] the logistic regression model included: the use of oral contraceptives, BMI, changes in body weight, alcohol consumption, past pregnancies, smoking. The elevated BMI, especially in young women and in those after at least 4 labours was a statistically significant factor predisposing to cholelithiasis. Unlike in our study, low correlation power was observed between the use of oral contraceptives and cholelithiasis, which was slightly higher when contraceptives had been taken for over 15 years. The correlation power was increasing slightly in currently smoking women, as compared to non-smokers. However, the analysis of logistic regression of risk factors of cholelithiasis in men in Japan has revealed that alcohol consumption reduces the risk of cholelithiasis, BMI – positively correlates with cholelithiasis, glucose intolerance only slightly increases the risk and diabetes is not a risk factor [10]. In our study, concomitant diabetes was not a risk factor of cholelithiasis in men, but the risk occurred with obesity and high serum triglycerol level.

Thus, both the outcome of our study and the findings obtained by other authors seem to indicate that cholelithiasis etiology depends largely on the power of synergistic action of the respective risk factors. In women from Podlasie these factors include: overweight or obesity, age, diabetes and the use of contraceptive pills; to a lesser extent positive family history of diabetes, number of labours and abortions, serum TG levels and passive leisure. In men from Podlasie, these are: age, elevated TG levels, obesity and to a lesser degree passive leisure. The presented hereby ranking of factors predisposing to cholelithiasis in both genders indicates health related needs and points at high risk groups. The essence of promoting actions is a change of bionegative behaviours and favouring healthy lifestyle. In many countries, health promotion is regarded as the only alternative for the steadily increasing health protection expenses [13]. Age and gender are the risk factors of cholelithiasis independent of health promoting actions. However, a lot can be done to reduce overweight and obesity, as well as indirectly diminish the incidence of insulin-dependent diabetes or serum TG level. The beneficial effect of physical activity should be constantly emphasized. The preventive measures can be divided into several stages [14,15]. In the first stage, patients with elevated BMI and serum glucose and/lipid levels (especially TG) are detected and subjected to intensive preventive treatment. In the second stage, efforts are made to reduce the above parameters in the whole population by promoting proper nutrition and physical activity [16].

Concluding, the presented hereby ranking of the risk factors of cholelithiasis in women and men allows determination of groups being at high risk of this disease. Health promoting behaviours in these subjects should tend towards body mass normalization, promotion of healthy diet, and active leisure.

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The attitude of nurses for the enhancement of palliative care in Greece

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Abstract

Purpose: The aim of this study was to estimate the attitude and knowledge of nurses for the development of palliative care in Greece.

Material and methods: A certain questionnaire with closed questions was developed and was use as research method to collect all the necessary data to support or question the hypotheses. Eighty one nurses participated in this study. The data collected was analysed using the SPSS software.

Results: Of the 81 nurses questioned 22 (27.16%) were men and 59 (72.84%) were women. The average was 37.19±9.16 years of the working Experience was 14.83±9.02 years in different units, 34.3%. Answered that the palliative care must be specialty, 43.2% specialization and 23.5% course.

Conclusions: The majority of nurses believe that if they had working experience in different units this won't give them the capacity to deal with patients who suffer from advanced disease.

Key words: nurses, palliative care, cancer, Greece.

Introduction

Palliative care is a philosophy that provides a combination of active and compassionate therapies to comfort and support patients and families who are living with life-threatening illness while being sensitive and respectful of their values, traditions, and religious, cultural, and personal beliefs [1]. The World Health Organization defines palliative care as one that affirms life and regards dying as a normal process, does not hasten nor postpone death, provides relief from pain and other symptoms, integrates the psychologic and spiritual aspects of care, offers support to help people live actively until they die, and supports the family throughout the patient's illness and their own bereavement [2]. The current palliative care movement began in the United Kingdom in the 1970's in response to the need to address the suffering of the terminally ill. It is very important for nurses to recognize the importance of nursing response to the needs for care in patients with advance disease. The International Council of Nurses Supported that nurse has a unique and primary responsibility for ensuring that individuals at the and of life experience a peaceful death [3]. Sheehan has supported that it is very important to connect both didactic and clinical components in the undergraduate and postgraduate curriculums [4,5]. The Breen School of Nursing at Ursuline College in Pepper Pike, Ohio was the first graduate program to prepare advanced practice nurses in palliative care.

Materials and methods

Research was both qualitative and quantitative. A questionnaire was used as research method to collect al necessary data to support or question the hypotheses. Eighty-one nurses who work in home care units and in different department in the hospitals were participated in this study. The data was analysed using the SPSS software and will be presented in a text but tables and graphs will also be used. These nurses felt reluctant to express their opinion as this new form of health care is not widely discoursed in Greece and they did not fee confident enough about their knowledge on the subject.

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Table 1. **Departments of working experience**

	Departments of working experience	A	B	C	D	Total
1	Surgical	52			1	53
2	Pathological	14	32	1	1	48
3	Outpatient Unit	1	4	3		8
4	Pain Unit	4	2			6
5	Home Care Unit	4			1	5
6	Intensive Care Unit	3		7		10
7	Psychiatric Unit	1				1
8	All of the above	2				2
9	Oncology		1	1		2
0	No answer		42	69	78	
	Total	81	81	81	81	

Table 2. **Answers on question "do you believe that patients suffering from advanced cancer disease should be taken care in"**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 1	1	1.20	1.20	1.20
2	22	27.20	27.20	2.40
3	11	13.60	13.60	42.00
4	7	8.60	8.60	50.60
5	18	22.20	22.20	72.80
6	22	27.20	27.20	100.00
Total	81	100.00	100.00	

Results

Quantitative Findings

Gender Out of the 81 people questioned 22 were men representing 27.16% of the sample and 59 were women representing a 72.84% of the total sample. Both nurses and doctors were asked to fill in the questionnaires but the majority of the sample was nurses, who in the Greek hospitals are mainly women. That's why our sample gives such a high percentage of women correspondents.

Age The average age of the people questioned was 37.19, with the older being 56 and the youngest 22 years old. The average age is rather young since most of the individuals willing to set the appointment to fill in the questionnaire were young people who could see the importance of a new qualitative form of care.

Years of working experience The average number of years that people being asked have been working was 14.83 (1-34) years. This average denotes that people being asked have enough working experience, which gives them the ability to judge better the needs of patients and health care system. Most of nurses worked in surgical (n=53) and pathological (n=48) departments.

Years of working experience in different departments Only 2 people did have working experience in an oncology department representing 0.17% of the total sample. One had 4 years and the other 10 years of working experience.

The average number of years of work in pain unit is less than 1 year (0.59). Specifically, 5 people had worked in pain unit for 4 years and 2 for 14 years. In home care unit the mean number of years of the total sample is 0.28. Only 7 individuals out of the 81 had worked in home care, 6 for 3 years and 1 for 5 years. The almost non-existent working experience of the sample in oncology, pain and home care departments is due to the fact that Greek hospitals don't have such units. Cancer patients and patients suffering from chronic diseases are treated in general departments depending on the implications of their disease.

Questions

On the question:

1) Palliative care should be: speciality or course. Almost 34.6% of nurses answered speciality, 43.2% specialization and 22.2% course. This declares the impelling need for palliative care to be more than a course. People believe that they need to have enough knowledge in order to be able to offer qualitative palliative care.

2) Do you believe that your basic training gives you the capacity to deal with patients with advanced cancer disease? To this question 34.6% answered "Yes", 14.8% "No" and 50.6% chose the third alternative. In a bar chart this is depicted as following.

3) Do you believe that your working experience in different general departments gives you the capacity to deal with patients who suffer from advanced cancer disease? In this question, answers are almost equally divided to those who believe that their working experience in different departments is enough to handle advanced cancer patients and to those who believe that special training is needed.

4) Do you believe that if you had working experience in an oncology department this would give you the capacity to deal with patients who suffer from advanced cancer disease? Almost 49.4% of the people questioned answered "Yes", 9.9%, meaning 8 people out of the 81, answered "No" and 40.7% said that they need special training.

5) Do you believe that if you had working experience in pain and home care units this would give you the capacity to deal with patients who suffer from advanced cancer disease? Only 7 people representing 8.6% answered "No", while 36 (44.4%) answered "Yes" and 38 (46.9%)chose the third alternative.

6) Do you believe that patients suffering from advanced cancer disease should be taken care in? a) General departments in a hospital, b) Hospice, c) Special units offering palliative care in a hospital, d) Home in co-operation with a hospital, e) Home in co-operation with a Hospice, f) Home in co-operation with special hospital units. The different answers are shown in *Tab. 2*. Here it is evident that we have a wide dispersion of answers. Still, the preferences for hospice and home settings to offer palliative care are prevailing. Only 1 individual said that general departments of a hospital are adequate to offer palliative care.

7) Do you believe that palliative care should be taught in undergraduate level? The majority of the respondents (86.4%) answered "Yes" and the rest 13.6% answered "No", which means only 11 people out of the 81 don't think that palliative care should be taught in undergraduate level.

8) Do you believe that palliative care should be a course in postgraduate studies? In this case the 72.5% of the respondents answered, "Yes". The answers to questions 7 and 8 make explicit the necessity to include palliative care in universities and educate future doctors and nurses so as they become ready to exercise palliative care to patients.

9) Do you believe that in hospice and palliative care a nurse can be the co-ordinator of the interdisciplinary team? The vast majority answers that yes a nurse can be the co-ordinator of the interdisciplinary team, which proves the crucial role of a nurse as a team member.

10) Who to your opinion should be the co-ordinator? In this question four alternative answers were given: a) doctor, b) nurse, c) health scientist, d) N/A. In this question that was semi-structured, 41 individuals answered that the co-ordinator should be a doctor and 26 that should be a nurse. Here the role of the doctor is prevalent as is the hospice medical director's mentioned in the literature review. In no way this does imply that the role of a nurse is inferior, because as it was seen from the previous question the majority of the answers were for a nurse to be co-ordinator of the interdisciplinary team. It is worth mentioning that 12 people couldn't make up their mind of who the co-ordinator should be, probably because they believe that this role should be given solely neither to a doctor nor to a nurse.

11) Should the nurse apply standards that have already been tested? The majority of respondents (87.7%) replied "Yes" as it can be seen in the following table and graph.

12) The co-ordinator should be: a) registered nurse with special training, b) registered nurse with working experience in oncology department, c) registered nurse with working experience in home care unit, d) registered nurse with working experience in pain unit, e) assistant nurse with working experience in oncology department. No one of the respondents chose the 5th answer. The majority of the individuals believe that the co-ordinator should be a registered nurse with special training (42%) and the second highest percentage is for a registered nurse with experience in oncology department.

13) Do you believe that volunteers are an absolute prerequisite to palliative care? Almost 81.5% of the respondents believe that they are, 3.7% believe not and 14.8% claim that volunteers are necessary in rare occasions. This high percentage shows that volunteers are vital members of the team to offer support to patients.

Discussion

The analysis of both quantitative and qualitative research shows that people believe that hospice and palliative care offers qualitative services. Interviewees, when defining hospice and palliative care, considered it as an institute that offers quality of life to patients. Almost in each and every theme of the interview discussion, trained and educated personnel were considered of paramount importance. The majority of the respondents in the quantitative research believe that hospice and palliative care should be included in undergraduate and postgraduate studies, should be a specialty or specialization, that people offering such form of care should be specially trained regardless of their basic training or experience in different departments, that standards already been tested should be applied, that organized hospices abroad must be visited to learn the know-how, that special scientists should be invited to contribute to a better organization of hospice and palliative care and that each patient must be treated as a unique person. These findings clearly support the hypothesis that hospice and palliative care is effective dealing with patients' medical problems offering them quality of life [6-11]. The research findings are also aligned with the literature findings [12-14] mentioning that one of the main roles of a hospice medical director is the formulation and presentation of educational programmes, that the future of a hospice and palliative care organization is mainly based on the quality of services offered, that pursuit of quality is a complex process which demands on-going commitment, that hospice managers should evaluate performance of similar organizations to review standards, identify quality elements to measure and rate current practices and that the role of the caregivers and all other people involved should be evaluated as part of continuous quality improvement.

Findings of both research types agree on the importance of teamwork and co-operation. Respondents of the quantitative research supported that a registered nurse could be and a physician should be the co-ordinator of the hospice interdisciplinary team and that other.

In the interview phase people stated that special building facilities of a hospice are prerequisites for applying effective palliative care. The respondents of the quantitative research claimed that palliative care must be offered in a hospice, or at home in co-operation with a hospice or with special hospital units. These findings are aligned with the literature review presented about service settings required to apply palliative care [15-18]. Literature findings from foreign bibliography showed that costs incurred by home care clients are significantly less than costs incurred in skilled nursing facilities [7,9,11]. There was no domestic literature found to prove the same analogy. Despite this and based on research findings and foreign bibliography it can be said that the hypothesis that systematically applied hospice and palliative care reduces the overall cost of health care is partially proven.

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Quality of life, depressive symptoms and anxiety in hyperthyroid patients

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Abstract

Purpose: **The aim of the study was to evaluate quality of life and to assess frequency and severity of depressive and anxiety symptoms in hyperthyroid patients.**

Material and methods: **Forty-seven hyperthyroid patients (38 female, 9 male, mean age 51.4±13.0; 25-Graves disease, 22 – nodular goitre) and fifty-eight sex- and age-matched controls (40 female, 18 male, mean age 49.6±16.0) were studied. Quality of life was assessed by means of WHO QuoL Questionnaire. Psychometric evaluation included assessment of depressive symptoms (Hamilton Depression Rating Scale and Beck Depression Inventory) and anxiety level (State and Trait Anxiety Inventory – STAI).**

Results: **Patients presented significantly decreased perception of quality of life and health state, and scored worse in physical domain and global score of WHO QuoL. Nineteen patients showed depressive symptoms, remaining 28 were euthymic. Level of anxiety did not differ significantly between the patients group and controls. Free thyroxine plasma level correlated with psychological domain of QuoL. Depression severity correlated with anxiety (STAI 2). Anxiety as a state marker influenced psychological and environmental domains and global score of quality of life questionnaire.**

Conclusions: **The influence of hyperthyroidism on the quality of life was observed. Depressive symptoms are frequent in hyperthyroidism, occurring in 40% hyperthyroid patients. We found also the association between the anxiety level and the quality of life.**

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Key words: hyperthyroidism, quality of life, depression, anxiety.

Introduction

Quality of life is of central concern in evaluative research; improved quality of life is probably the most desirable outcome of all health care policies. However, definitions of quality of life are as numerous and inconsistent as the methods of assessing it [1]. No consensus exists in the health care disciplines about what quality of life is or how it should be measured [2]. According to WHO quality of life is to be evaluated predominantly by the individual involved. World Health Organization defines Quality of Life as an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. Quality of life depends on many factors, most important factors constitute the health state, social and economic situation and satisfaction with professional and personal life.

Hyperthyroidism results from overproduction of thyroid hormone by the thyroid gland. The most common causes are Graves' disease (accounting for 80 percent of cases) and toxic nodular goitre. Somatic symptoms of hyperthyroidism include increased pulse, arrhythmias, elevated blood pressure, fine tremor, heat intolerance, excessive sweating, increased appetite, weight loss, palpitations, tachycardia, frequent bowel movements, menstrual irregularities, muscle weakness, exophthalmos, lid lag, infrequent blinking, and hyperactive deep tendon reflexes [3]. Thyroid disorders may induce virtually any psychiatric symptom or syndrome, although regular associations of specific syndromes and thyroid conditions are not consistently found. Hyperthyroidism is commonly associated with fatigue, irritability, insomnia, anxiety, restlessness, and emotional lability; marked impairment in concentration and memory may also be evident [4].

Thyroid dysfunctions can cause mood changes, anxiety and influence quality of life of patients – even mild thyroid

Table 1. **Comparison of quality of life in hyperthyroid patients and healthy controls**

	Quality of life	Patients	Controls	
J1	perception of QuoL	3.68	4.12	*
J2	perception of health	2.63	3.79	*
D1	physical domain	13.29	16.52	*
D2	psychological domain	13.30	14.38	NS
D3	social domain	14.06	15.26	NS
D4	environmental domain	14.25	14.77	NS
Total score		55.83	61.07	*

* $p<0.03$

abnormalities may be associated with changes in mood and cognition [5]. Thyroid diseases (hypo- and hyperthyroidism) may induce almost any psychiatric symptom or syndrome. However, they do not cause symptoms typical of a specific diagnosis [6], and patients report various psychiatric symptoms [7]. In patients with hyperthyroidism anxiety and depression are the most commonly described [8]. Depression occurs in 23% of patients with Graves' disease, it appears in the prodromal phase in 14% of these patients [9].

The aim of our study was to evaluate the impact of the thyroid dysfunction on the quality of life of hyperthyroid patients and to assess frequency and severity of depressive symptoms occurring in this patients group.

Material and methods

Forty-seven hyperthyroid patients (9 male, 38 female, mean age 51.4±13.0). Twenty-five patients were diagnosed with Graves disease, twenty-two with nodular goitre) fifty-eight sex- and age-matched controls (18 male, 40 female, mean age 49.6±16.0) also were studied. Diagnosis was made according to ICD-10 [10] criteria on the basis of increased plasma concentration of free thyroxin (fT4) and decreased plasma concentration of thyroid stimulating hormone (TSH) and ultrasonography (USG) of thyroid gland, and in Graves disease – assessment of TSH-receptor antibodies.

Quality of life of patients and controls was assessed by the World Health Organization Quality of Life questionnaire [11]. WHOQOL-BREF is a valid and reliable tool in the assessment of quality of life [12]. It contains four domains: physical, psychological, social and environmental, and two importance questions: concerning individual general perception of quality of life and concerning individual general perception of own health.

Psychometric evaluation included the assessment of depressive symptoms (Hamilton Depression Rating Scale – HDRS [13], Beck Depression Inventory – BDI) [14] and anxiety level (State and Trait Anxiety Inventory – STAI).

Results

Patients presented significantly decreased perception of quality of life and health state, and scored worse in physical domain and global score of WHO QuoL (*Tab. 1*).

Table 2. **Comparison of anxiety levels in hyperthyroid patients and controls**

Anxiety	Patients	Controls
STAI – trait marker	47.62±14.96	39.93±11.64
STAI – state marker	46.75±9.35	43.35±17.05
Statistics	NS	NS

Table 3. **Correlations of indices of thyroid dysfunction, anxiety and depression and quality of life**

	STAI-2	D1	D2	D3	D4
HDRS	0.65	NS	NS	NS	NS
STAI state marker (STAI 1)		NS	-0.69		-0.67
freeT4		NS	0.58		

$P<0.05$

Mean depression level in BDI was 11.36±8.96, in HDRS – 5.67±5.92. Nineteen patients (40.4%) showed depressive symptoms. Only one hyperthyroid patient met criteria for major depressive episode, 28 patients were euthymic.

Patients showed higher level of anxiety as a trait marker, but the difference did not reach the statistical significance (*Tab. 2*).

In *Tab. 3* associations between free thyroxin, anxiety and depressive symptoms and quality of life are presented. FT4 plasma level correlated with the level of anxiety as a trait marker, a psychological domain of QuOL. Depression severity correlated with anxiety (STAI-2). Anxiety as a state marker influenced psychological and environmental domains and global score of quality of life (*Tab. 3*).

Discussion

Our study confirmed the results of previous reports on the association of endocrine disorders with mood changes and anxiety. Rockel et al. [15] in hyperthyroid patients observed a significant increase in anxiety, a sense of not feeling well, and emotional irritability as well as a tendency towards depressiveness, and an increased lack of vitality and activity comparing to healthy controls. In our study a trend towards increased anxiety level was observed. Similarly to Rockel in hyperthyroid patients we observed depressive symptoms which did not meet criteria for depressive syndroms. The rate of major depression in our study was much lower than that observed by Trzepacz et al. [16] and Kathol and Delahunt [17]. Kathol and Delahunt [17] stated that the number of patients with depression and anxiety in their group was felt to be artificially inflated by the concurrent presence of somatic thyroid symptoms. In the study by Engum et al. [18] hyperthyroidism was not risk factors for depression or anxiety, the authors found no statistical association between thyroid dysfunction, and the presence of depression or anxiety disorder. Trzepacz et al. [19] did not find any correlations between thyroid function indices and depression and anxiety in hyperthyroid patients.

Our results suggesting the association of fT4 concentration and anxiety level sould be confirmed in a larger patients

group. According to other authors hyperthyroid patients were more depressive, anxious, touchy and irritable; and showed a higher degree of emotional lability, excitement and irritability than euthyroid controls [20]. In the study by Sait Gonen et al. [21] patients with subclinical hyperthyroidism had significantly higher anxiety scores in Beck's Anxiety Inventory (BAI) than euthyroid group.

Our results are consistent with those of Sait Gonen et al. [21] that mood changes especially anxiety due to thyroid dysfunction may have an important impact on the patient's quality of life. The great majority of studies concerning quality of life in hyperthyroidism are focused on patients with Graves' ophthalmopathy. Different scales measuring quality of life are being used in these investigations. Patients reported limitations in daily activities such as hobbies, driving, watching television and reading, as well as impaired self confidence. Only about a quarter of patients indicated that education and counselling were adequate and helpful. In a study by Kahaly [22] general quality of life was assessed using the Medical Outcomes Study (MOS-36). Worse scores on the MOS-36 in hyperthyroid patients were found comparing to large reference group. Marked and significant differences from the control group were especially observed for the following items: vitality, social functioning, mental health, health perceptions, and body pain. Biondi et al. [23] reported notable impairment of quality of life in patients with subclinical hyperthyroidism. General health-related quality of life is markedly impaired in patients with Graves' ophthalmopathy, and even worse than in patients with other chronic conditions like diabetes, emphysema or heart failure [24].

In our study the influence of hyperthyroidism (not only Graves' ophthalmopathy) on the quality of life was investigated. Hyperthyroid patients in our study significantly worse perceived their quality of life and health state, hyperthyroidism worsened also the score in physical domain of quol and global score of quality of life.

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Bilateral facial nerve palsy in the course of neuroborreliosis in children-dynamics, laboratory tests and treatment

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Abstract

Purpose: **Presentation of four patients with bilateral peripheral facial nerve palsy as a clinical manifestation of neuroborreliosis in children – diagnostic, treatment and prognosis.**

Material and methods: **In 2002-2004 in The Chair and Department of Developmental Neurology, 24 children from the Wielkopolska region were admitted with diagnosis of borreliosis. Among all the children with borreliosis, confirmed by serologic examination, 4 (16.7%) demonstrated bilateral peripheral facial palsy (PFP). We investigated the presence of IgM class and IgG class specific antibodies in the sera and cerebrospinal fluid (CSF) of 4 patients with bilateral PFP. (Detected by immunoenzymatic methods – ELISA.)**

Results: **Before the occurrence of PFP all the children manifested unspecified systemic symptoms such as headaches, muscle and articulation pains, weakness and in two cases a mood depression. At first all patients demonstrated elevated IgM antibodies and proper levels of IgG antibodies. Control tests administered within 2-14 months later reduction of antibodies was indicated. Two patients demonstrated significant pleocytosis in CSF test, (without the meningeal symptoms). All children were treated with physiotherapeutic procedures and were administered antibiotic intravenously.**

Conclusions: **PFP is one of the most frequent neurological symptoms of borreliosis in children. In case of acute PFP and especially the bilateral form of PFP, neuroborreliosis is the most probable diagnosis. All children reported PFP at one side first and after several weeks the paresis of the facial nerve on the opposite side usually appeared. The clinical state of children started to improve after the introduction of physiotherapy and this process usually lasted several months.**

Key words: neuroborreliosis, bilateral peripheral facial nerve palsy, neuroborreliosis in children.

Introduction

Acute onset of peripheral facial nerve palsy (PFP) in children is frequently the result of neuroinfection [1,2]. Examination conducted in the 90's by Cook et al. showed that borreliosis was found to be the etiological factor of PFP in 50% of examined children [2]. The results are confirmed by other examinations [3,4]. It is important to remember that PFP may be the only [3,5, 6] or the dominant symptom of borreliosis in children [6,7]. PFP may occur bilaterally, especially in children [6].

Borreliosis, known also as Lyme disease is evoked by Gram-negative Spirochaetes [3,5,7-12] – Borrelia burgdorferi [8,10]. The increase of morbidity is the highest among the zoogeneous diseases, between 2001-2002 it rose up to 40% in the USA [13].

In Poland, average index morbidity of borreliosis was 2.3/100000 in 1998 [7]. Precise data about morbidity in particular regions of Poland are unknown. Percentage of infected ticks is highest in endemic north-eastern regions (5-58%) [7,12].

On the basis of genetic examinations Borrelia burgdorferi Spirochaetes were divided into 11 subtypes [10], out of which 3 are considered to be pathogenic for a human being: Borrelia burgdorferi sensu scricto, Borrelia garinii, Borrelia afzeli [8,10,14]. The differences in geographical occurrence of particular Spirochaetes subtypes were observed: Borrelia burgdorferi dominates in the USA, whereas garinii and afzeli subtypes

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Table 1. **Clinical manifestations in patients with serologically confirmed neuroborreliosis**

Clinical manifestations	Number	[%]
Headaches	11	45.8
Fatigability, general weakness	8	33.3
Syncope	6	25
Unilateral facial nerve palsy	5	20.8
Osteomuscular pain	5	20.8
Bilateral facial nerve palsy	4	16.7
Dysmnesia, concentration disorder	4	16.7
Cervicofacial pain on paresis site n. VII	4	16.7
Mood depression	3	12.5
Irritability	2	8.3
Augmentation of cervical and submandibular nodes	2	8.3
Erythema migrans	1	4.2
Inflammation of many articulations	1	4.2
Unpleasant feeling of heart palpitation	1	4.2
Neuronitis vestibularis	1	4.2
Unspecified abdominal, nuchal, leg pain	1	4.2
Dysgeusia	1	4.2
Low tones hypersensitivity	1	4.2

appear mainly in Europe [8,11,14,15], which were not detected in the USA [16]. It was also noticed that Borrelia garinii is characterized by affinity to the nervous system and is responsible for the majority of neurological symptoms [6-8,15]. There were also described single cases of parallel infection by two subtypes of Borrelia in a patient with bilateral PFP [17].

The infection is evoked by a bite of tick of Ixodes family infected by pathogenic Spirochaetes [3,7-9,11,14,15,18].

Antibodies of IgM class, detected by immunoenzymatic methods (ELISA) appear within 2-4 weeks [6,11,12,14] reaching the peak within 6-8 weeks [6,12,14], and after 4-6 weeks antibodies of IgG class occur [6,11,14] staying present for many years [6].

The examination by western blot is used to eliminate the false positive results and to interpret the borderline values [12, 14,19]. In the USA the principle of „two-step protocol" has been introduced, while the first test ELISA is confirmed by the result obtained by western blot [20].

Borreliosis is the multisystem disease [3,7,12,21] occurring in 3 stages and involving dermatological, cardiological, neurological and rheumatological types [3,12].

Neuroborreliosis is the nervous form of borreliosis. It was described about 25 years ago for the first time [18]. The premature symptoms of neuroborreliosis are: cerebrospinal meningitis, PFP, other cranial nerves inflammation and radiculoneuritis [8,21]. Almost 10% of the patients with borreliosis manifest the neurological symptoms [8,22]. In Europe neuroborreliosis is diagnosed more frequently than in the USA in relation to Borrelia garinii neurotropism [6-8]. In the course of neuroborreliosis alterations in the cerebrospinal fluid (CSF) such as cytosis with the prevalence of mononuclear cells [6,10,23,24] and the increase of protein concentration [6,10,24] usually occur after 3 weeks of the disease [21].

Material and metods

In 2002-2004 in The Chair and Department of Developmental Neurology Poznań University of Medical Sciences Poland 24 children from the Wielkopolska region were admitted with diagnosis of borreliosis. Among all the children with borreliosis, confirmed by serologic examination, 9 (37.5%) manifested PFP out of whom 4 (16.7%) demonstrated bilateral PFP. The *Tab. 1* presents the clinical manifestations of the observed patients.

Results

The *Tab. 2* encloses clinical manifestations and dynamics of pathological symptoms in 4 patients with bilateral facial nerve paresis.

Patient I

Fifteen-year-old patient was diagnosed due to bilateral facial nerve palsy. A few months after the stay in forest areas the sudden onset of the frontal left-sided pain appeared. Consequently, progressive paresis of innervated muscles through the left facial nerve occurred which successively spread over the muscles of facial expressions starting with the forehead downward to the lower parts of the face. Unspecified general symptoms were presented in the *Tab. 2*. Oral doxycyline treatment (100 mg/day) was given during 21 days, with no clinical improvements. However, a few days after the treatment was stopped, the paresis of the right facial nerve appeared which also was initiated with the frontal region pain on the right side. Serologic examination of blood serum confirmed the diagnosis of neuroborreliosis (*Tab. 3*). The girl was treated with an intravenous antibiotic: 2 g of ceftriaxone was given daily for 2 weeks. Prednison was given in decreasing doses for 25 days. During electrostymulation VII nerves procedures and Solux irradiation therapy, galantamine was given subcutanously for 30 days. After pharmacological treatment and a series of electrostimulation slow improvement has been obtained, leading to total regression of bilateral facial palsy (*Tab. 2*). Five years before the onset of bilateral facial paresis the patient complained of the left facial nerve paralysis. No serologic examination was conducted for borreliosis. The paresis disappeared after the period of 6 weeks after the administration of antibiotic (amoxicillin with clavulonic acid), prednison, galantamine, B-vitamins and facial massage.

Patient II

Nine-year-old patient was treated in hospital due to bilateral facial palsy. The boy lives with parents in a farm located near the forests. The patient manifested the paresis of innervated muscles through the right facial nerve, preceding for about 4 weeks the occurrence of left facial nerve palsy. Unspecified systemic symptoms had appeared before the neurological signs occurred (*Tab. 2*). The boy was treated with an intravenous antibiotic: 1 g of ceftriaxone was given daily for 2 weeks. Procedures of electrostymulation VII nerves and galantamine were applied for 20 days. Serologic blood plasma tests and examination of cerebrospinal fluid (CSF) confirmed the diagnosis of neuroborrelio-

Table 2. **The case history and the physical examination and dynamic of pathological changes in patients with bilateral facial palsy**

Case description	Patient I	Patient II	Patient III	Patient IV
Age in years	15	9	14	8
Sex	F	M	F	M
Stay in forests	+	+	+	+
Tick /medical history/	-	-	+	+
Site after tick bite	-	-	+	+
Erythema migrans	-	-	-	-
Borrelial limphocytoma	-	-	-	-
Bony and muscular pain	+	+	+	+
Bilateral lid tremor	+	-	-	-
Headaches	+	+	+	+
Vertigo	+	-	-	-
Irritability	-	-	-	+
Fatigability, weakness	+	+	-	+
Mood depression	-	+	-	-
Dysgeusia	-	-	-	-
Low tone hypersensitivity	-	-	-	-
Facial and cervical pains of paresis site n. VII	+	-	-	-
Unspecified abdominal, nuchal, leg pain	-	-	-	-
Enlargement of cervical and submandibular lymphatic nodes	-	-	+	-
Time interval between facial nerves palsy	About 1 month	About 1 month	About 2 weeks	3 days
Start of regression of facial nerve palsy	After 14 days of therapy	After 6 days of therapy	After 14 days of therapy	After 30 days of therapy
Total regression of symptoms left side	After 2 months	After 3 weeks	After 2 months	After 2 months
Total regression of symptoms right side	After 3 months	After 6 months slight paresis	After 4 months	After 2 months

sis (*Tab. 3*). Control serological test, which was performed after treatment, revealed slow regression of IgM and IgG antibodies titre in blood plasma and CSF. Decreasing of specific antibodies correlated with gradual improvement of clinical condition of the patient (*Tab. 2*).

Patient III

Fourteen-year-old patient was admitted to hospital and treated due to bilateral facial palsy. In summer of 2002 when the girl stayed in forest areas, she noticed ticks on her body twice. It was thoroughly removed in both cases. After the period of 2 months, at the time of upper respiratory tract infection and after a stressful situation, there was a sudden onset of innervated muscle paresis through the right facial nerve, which was followed by the left PFP within 2 weeks. Before the appearance of facial nerve paresis the patient manifested a series of general symptoms presented in the *Tab. 2*. Serologic blood plasma test confirmed the diagnosis of borreliosis (*Tab. 3*). The girl was treated with an intravenous antibiotic: 2 g of ceftriaxone was given daily for 3 weeks. Prednison was given in decreasing doses for 23 days. Solux irradiation therapy was applied for 20 days. After the pharmacological treatment and physiotherapy, slow improvement of neurological condition occurred, but there appeared bilateral spasms of muscles of facial expressions, provoked by face cooling.

Patient IV

Eight-year-old patient was diagnosed of the recurrent facial nerve palsy. The left PFP occurred 5 years earlier, which after the introduction of pharmacological-rehabilitation treatment subsided. The second episode of facial palsy, right-sided this time, occurred 3 years later. The symptoms totally disappeared after the introduction of anti-inflammatory treatment. In summer 2004 the boy was bitten by a tick and few weeks later, among the unspecified general symptoms, the sudden onset of bilateral facial nerve paresis was recorded within 3 day-period (*Tab. 2*). Serologic tests of blood plasma and CSF confirmed the diagnosis of neuroborreliosis (*Tab. 3*). The child was treated with two antibiotics. Oral doxycyline treatment (100 mg/day) was given during 21 days, with no clinical improvements. Therefore intravenous ceftriaxone treatment (2 g/day) was given during 22 days. Series of bilateral facial nerve electrostimulation and facial massage were applied for 20 days. Slow clinical improvement was confirmed by blood and CSF serological test (*Tab. 3*).

Discussion

All cases of bilateral PFP included circumstances where the tick from Ixodes ricinus family could have bitten our patients. These ticks are carriers of Spirochaetes. Only in two cases the

Table 3. **Results of laboratory tests in patients with bilateral facial palsy**

Type of examination	Patient I	Patient II	Patient III	Patient IV
I. Serologic test of blood serum for borreliosis				
IgM (Test IDEIA TM IgM)	0.630 (+)	1.220 (+)	1.650 (+)	3.690 (+)
IgG (Test IDEIA TM IgG)	0.110 (–)	0.590 (+/–)	0.070 (–)	0.500 (+/–)
II. Serologic test of blood serum for borreliosis				
	After 2 months	After 4 months	After 4 months	After 18 days
IgM (Test IDEIA TM IgM)	0.40 (–)	0.620 (+)	1.120 (+)	2.770 (+)
IgG (Test IDEIA TM IgG)	0.060 (–)	0.410 (+/–)	0.210 (–)	0.110 (–)
III. Serologic test of blood serum for borreliosis				
			After 14 months	
IgM (Test IDEIA TM IgM)	~~~~	~~~~	0.820 (+)	~~~~
IgG (Test IDEIA TM IgG)	~~~~	~~~~	0.050 (-)	~~~~
I. CSF examination				
Pleocytosis	1.3/ul	135.5/ul	1.7/ul	454/ul
Protein concentration	19 mg/dl	54 mg/dl	20 mg/dl	59 mg/dl
IgG concentration	2.48 mg/dl	~~~~	1.75 mg/dl	9.14 mg/dl
IgG index	0.58	~~~~	0.75	0.64
Serologic test of CSF for borreliosis				
Lyme IgG and IgM(LYT)	TV negative	~~~~	~~~~	~~~~
IgM (Test IDEIA TM IgM)	~~~~	3.570 (+)	(-)	3.560 (+)
IgG (Test IDEIA TM IgG)	~~~~	1.810 (+)	(-)	0.780 (+)
II. CSF examination				
	~~	After 2 weeks	~~~~	After 17 days
Pleocytosis	~~~~	50.7/ul	~~~~	18.0/ul
Protein concentration	~~~~	19 mg/dl	~~~~	16 mg/dl
Serologic test of CSF for borreliosis				
IgM (Test IDEIA TM IgM)	~~~~	3.360 (+)	~~~~	3.340 (+)
IgG (Test IDEIA TM IgG)	~~~~	1.280 (+)	~~~~	0.080 (–)
Neuroimagining examination	MR normal	MR normal	CT normal	MR and CT normal

* CSF – cerebrospinal fluid; * MR – Magnetic Resonance; * CT – Computing Tomography

patients noticed the tick on the skin. None of the children reported dermal symptoms such as erythema migrans, which is the most frequent dermal form 85% [8], or occurring in 5% lymphocytoma [11]. The dermal manifestation is the most often diagnoses and is evaluated for 60-80% all cases of borreliosis [11]. However 1/3 of cases do not report any dermal changes, which significantly hinder the proper diagnosis [12]. Literature indicates the most frequent neurological symptoms of borreliosis such as headaches, paresthesis, PFP and radicular symptoms [25,26]. There are also reports that tension headaches are the only symptoms of neuroborreliosis [27]. Belman et al. report that 96 children manifested PFP as the most frequent neurological symptom [28]. In case of acute PFP and especially the bilateral form neuroborreliosis is the most probable diagnosis [29,30]. In our group of 24 children headaches appeared in 45.8% and PFP in 37.5 % (*Tab. 1*).

Before the occurrence of PFP all the children manifested unspecified systemic symptoms such as headaches, muscle and articulation pains, fatigue, weakness, excessive sleepiness and in two cases a slight mood depression. The occurrence of non-specific symptoms in the first stage of the disease is more characteristic for adults than for children [24]. All children reported peripheral paresis of the facial nerve at one side first and after 2-4 weeks the paresis of the facial nerve on the opposite side appeared. None of the children manifested the dysgeusia or low tone hypersensitivity. In one case the above mentioned sequence was preceded by the PFP (5 years earlier), however, diagnostics for borreliosis wasn't administered. All children were tested serologically of blood serum for borreliosis. The application of serologic tests is required in all cases of borreliosis, excluding primary dermal changes [10,31]. It is not indicated to test serologically all the patients bitten by a tick [31]. At first all patients demonstrated elevated IgM antibodies and proper levels of IgG antibodies. After 2-14 months, control serological tests revealed slow reduction level of antibodies in the blood serum and CSF. In all cases the examination of CSF was administered. However, American College of Physicians in 1997 defined no need to determine the level of antibodies in CSF in patients with symptoms of borreliosis [32]. The positive results of blood serum are considered to be satisfactory [32].

However, it is advised to administer the serologic tests of CSF in case of borreliosis suspected [33,34]. Boys manifested elevated antibodies of IgM and IgG, which after two weeks of treatment indicated the tendency of slow decrease. There were not any serologic or biochemical changes of CSF detected in girls. They do not exclude the diagnosis of neuroborreliosis since they may be negative in the chronic form of the disease [35]. Two patients demonstrated significant pleocytosis in CSF test, however, neither of them manifested the meningeal symptom. It is important to remember that because of the lack of the possibility to detect treponema in standard examinations [12,21] there are index substances being searched to correlate with the inflammatory process [21]. Cytokines [21,36] and apoptosis processes [36] are considered to be characteristic because of their role in pathogenesis of borreliosis. Determination of cytokines levels may become the effective method of disease course monitoring and effectiveness of antibiotic therapy [21].

Pathophysiology of PFP in borreliosis is not satisfactorily explained [3]. It is not clearly known if the lesion of facial nerve is caused directly by the treponema invasion or the effect of immunological processes [3,36,37]. There are reports underlying the presence of infiltration changes in nuclei and roots of VII nerve [38]. It is considered that more frequent occurrence of neuroborreliosis with spread over the cranial nerves in children is correlated with the localization of the bite in the region of the neck [24,39]. Similar conclusions were reached by Eiffert et al., investigating this phenomenon in animals [39].

There are not universal courses of borreliosis treatment in the available literature. However, it is considered that ceftriaxon administered intravenously for a period of 14 days in a dose of 2 g/24 hours should be applied in neuroinfection evoked by treponema (children below 12 years of age 50-100 mg/kg/24 hours) [6,8-10,14,18,19,40-44], for 6 weeks maximum [14]. The clinical status of children started to improve after the introduction of physiotherapeutic treatment.

Frequent occurrence of borreliosis and neuroborreliosis in the population of children from Wielkopolska region is possibly correlated with unsatisfactory social consciousness in relation to the prevention of tick bites, the lack of repellents application, protective dresses during walks in forests where these Arachnoideae live. The basic steps to be undertaken while staying in forests are body protection against the direct contact with ticks [6,8,9,14,40] and application of repellents against stinging and sucking insects [6,9,14]. It is necessary to emphasize that after forest walks examination all the child's body is urgent in order to remove 'any' ticks since treponema transmission takes place within the period of 24-48 hours [6,7]. Urgent removal of the tick is the elementary method of prevention and these procedures may obviate part of Spirochaetes infection [6,8-10,14].

In the USA vaccines containing OspA antigen have been introduced [6,8-10,40]. However, difference of Borrelia types in Poland may result in its ineffectiveness [14].

Conclusions

1. PFP is one of the most frequent neurological symptom of borreliosis in children. In case of acute PFP and especially the bilateral form of PFP neuroborreliosis is the most probable diagnosis.
2. All children reported PFP at one side first and after several weeks the paresis of the facial nerve on the opposite side usually appeared.
3. The clinical state of children started to improve after the introduction of physiotherapy.
4. Abatement of PFP symptoms usually lasted several months.

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Obeying patient′s rights on the basis of maternity ward

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Abstract

Purpose: **This work is an attempt to evaluate the extent of knowledge concerning patient's rights and chances to execute these rights in everyday hospital reality. We have collected opinions of the patients from the maternity ward of Independent Central Public Clinical Hospital of Medical University of Silesia in Katowice. We also interested in participation of medical staff in respecting and realization of patient's rights it has become the main objective of this work.**

Material and methods: **To collect the patient's opinions we used a specially prepared questionnaire which has measured obeying patient's rights in the following aspects: the rights to make decisions, the rights to information including the right to inspect medical data, the right to respect privacy and dignity, the right to treatment and care, the right to be in touch with relatives, the right the priest's care, the rights to file a complaint, the right to obey patient' rights.**

Conclusions: **Patient's rights in a delivery room and a maternity ward are not respected to a satisfactory extent which is confirmed by the research results. During the hospitalization the patients aren't informed and they do not acquire almost any knowledge concerning their rights. The patient staying in a maternity ward is in most cases only a passive receiver of medical service.**

Key words: staff, obeying, law, patient.

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Introduction

Progress of medical science and changes taking place in society's awareness have caused the constant growth of interest concerning the issue of how to protect our health. This leads, among other things, to the changes in mutual relationship between the patient and medical staff. The transformation of political system in Poland which started in 1989 has contributed to fundamental changes in Polish medical law. This has affected directly the growth of quality in medical care and the creation of legal acts protecting the patient and regulating problems connected with hospitalization [1].

Material and methods

The group of 227 woman hospitalized in the maternity wards and delivery rooms in hospitals in Katowice, Chorzów, Bytom, Tychy, Tarnowskie Góry, Piekary Śląskie were questionnaired between October 2003 and March 2004. The research encompassed patients after a physiological delivery and after a caesarean section in the first days of puerperium.

The research tool consisted of two questionnaires. The questionnaire no. 1 applied to patients in a puerperium after a physiological delivery and consisted of 44 questions while the questionnaire no. 2 containing 45 questions concerned patients in a puerperium after a caesarean section. 150 questionnaires have been analyzed out of 227 questionnaires since the remaining have not met the requirements of criteria for including into the research (the questionnaires were not filled in correctly, some answers were lacking).

The gathered research data have been statistically worked out according to given categories of features using a computer program Statistica 5.0.

Results

The results of the study demonstrate that the extent to which the knowledge concerning patients' rights is distributed appears to be insufficient in a given hospital unit. Most of patients (60%) have not heard about regulations protecting them, and from the remaining group 66.7% have admitted gaining this knowledge from the medical personnel (53.4% have acquired it from nurses and midwives while only 13.3% from doctors).

Accessibility to medical information does not only determine that a patient makes proper decisions related to predicted medical activities but also indicates respecting their dignity and autonomy [2,3]. From the research follows that the right to information has been almost entirely respected among women (75%), which allowed them for broadening their knowledge concerning their own health, methods of treatment and prognosis.

Respecting patients' rights to be informed about their own health state, prognosis, risk levels of the offered methods of treatment, etc. should be expanded to, in case of women, the knowledge about ways of attending a baby and women's own body, which visibly contributes to an increase in every patient's state of health. Following this theory, the patients under research have assessed gaining this information, bringing the result of only 38.7% cases where this right is implemented.

Lack of respecting patients' right to conscious participation in the process of treatment is reflected negatively in their lack of knowledge that is necessary to make a decision whether to give consent or refusal for a particular medical treatment [4]. Most frequently, the fact of lacking respect for 'a conscious consent' has been observed by the questioned patients in relation to the following interventions: shaving the perineum (50.6%), perineotomy (56%), using 'contractile drip infusion' (56.7%), catheterization of the urinary bladder (58%).

Predominantly, a patient staying in a health care institution (including patients in the delivery room and the maternity ward), ought to have the possibility to choose freely between some of the proposals offered by the medical personnel. It is essential that a woman delivering her baby should participate fully in the care that is offered to her. She ought to be given a possibility to choose, among others, ways of behaving in the above mentioned wards, method and place of labour, people that will accompany her as well as behaviors that are, according to her, proper and most convenient. Nevertheless, after carrying research it can be concluded that the majority of women in the delivery room have not had a choice in the following areas: choosing a position during labour (80%), eating meals (92%), using the equipment (SACCO bag, a ball, a ladder, a mattress – 64%), wearing their own underwear (82.7%), deciding on the person taking nursing care of her and the infant (89%), possibility of contact with a close relative during the labour (80.3%). An equally essential matter is a possibility to breastfeed the newborn baby directly after the birth, which has been assessed positively in 72.4%. The fact that ought to be highlighted is that a generally accepted requirement is that a woman after natural birth stays in the delivery room for, on average, 2 hours. Hence, the patients' dissatisfaction is legitimate, who claim that only 6.3% of them have had a stable contact with her child for longer than 30 minutes.

The necessity to terminate pregnancy by a caesarean section is a special time for every woman patient. This fact induces feelings of inconvenience, fear and anxiety particularly at the moment of termination. The opinion of patients who have undergone the caesarean section and have assessed the possibilities of the above mentioned services is as follows: 60.9% have had a choice of the type of anaesthetic 30.4% have been allowed for the presence of a close relative, 78.2% have had a contact with their newborn directly after the operation (however, only 65.2% of them have been enabled to start breastfeeding directly after the caesarean section).

The society should be made fully aware of the difficulty concerning the limited access to specific methods of diagnosis and therapy that modern medicine offers as well as there ought to be public debates concerning this issue. Nonetheless, in the hospital under research the evaluation of accessibility to examinations, medical equipment, dressings and medications has brought very good results (95%). However, the accessibility to family childbirth can be assessed as limited since 54.7% of patients staying in the maternity unit have been suggested to pay for this service.

Patient has the right to respect their rights and dignity and lack of respect of patient's dignity constitutes a serious transgression of health care personnel. Entering patient's privacy is an element of practice in the relation between the doctor/nurse/midwife and the patient [5]. Therefore, the conditions in which medical services are carried out are so vital. Carrying out patients' examinations (including obstetric examinations) by medical personnel in the presence of other people (especially other patients – 82.3%) is an alarming practice. Such practices represent a violation of the patient's right to protect their own dignity and intimacy, particularly in cases where 82.7% of patients have not been asked for allowance of the third party. When questioned about the assessment of intimate conditions during providing obstetric services, the patients have evaluated that in 68% the proper conditions have been ensured. Meanwhile, in general summary of ensuring privacy during overall stay in hospital only 38.7% patients affirmed that.

Discussion

The employed activities leading to the dissemination of patients' rights knowledge are not so far satisfactory. Budzyńska-Kapczuk A, Iwanowicz-Palus G and Kabacińska B [3,6,7] have stated that presenting patients' rights to them during the admission to hospital ranges from 30% to 70%.

The achieved by me results are indirectly confirmed in works of other researchers. According to Iwanowicz-Palus G, Kabacińska B, Kachaniuk H and co-authors, Piotrowski M and co-authors, and Poździocha S and co-authors the range of giving information to patients about the diagnosis, the prognosis and suggested methods of treatment is from 79% to 90% [4,6-9].

It has been noted that patients having their first childbirth have high expectations about the hospital staff as far as the education of breastfeeding, the child care and the care about their own body are concerned. They are unsure and confused in their new role in the first days after the delivery. An adequate

approach of the hospital staff has immense significance in relation to preventing difficulties arising during the mother–child contact. The research shows that only 38.7% of patients have gained a detailed information during their hospitalization concerning care about the child and their own body, which has been confirmed by the research of The Foundation Child Delivery in a Human Way 'Perinatal care…' [5].

A 'medical model of child giving' still prevails in a number of hospitals where the interventions of shaving the perineum, perineotomy and enema are routinely carried out [5]. The staff in majority of hospitals declares that enema and shaving the perineum are carried out only after the women' consent. These procedures are associated with the admission room despite the fact that it has no medical justification. Romney M. and co-authors [10] claim that the most frequent argument, however not justified, supporting the necessity of administering enema and shaving the perineum is a better hygiene. Up to 1994 shaving and enema were obligatory in all hospitals in Poland – The Foundation Child Delivery in a Human Way 'Perinatal care…' [5].

The induction of the labour has been known to midwives for ages, however, it has been used widely on a mass scale since the mid-fifties of the 20th century, that is, since when the synthetic oxytocin was obtained. It has been used rather quickly with a wider number of women until, as confirmed by the WHO research – Wagner M [11], this agent has become administered routinely in a number of countries to induce or to accelerate the labour. Nowadays, the overuse of this drug without medical justification as well as routine in its administration are stressed – Hourvitz A et al., Lazor LZ et al. [12,13]. According to Sipiński A and co-authors [14] this may be accounted for by the fact that women treat a contractile drip infusion as an inseparable attribute of a labour and, moreover, the fact that it is administered when a woman in labour has been informed of the 'delivery dystocia'. The results of my research differ slightly from the result of The Foundation Child Delivery in a Human Way 'Perinatal care…' [5] according to which the consent for a contractile drip infusion has been given by as many as 91% of patients.

The obligation of a hospital is to acknowledge a woman's right to choose the most comfortable position during the labour which is in accordance with her own instinctive feelings. Consequently, the labour usually becomes easier and less painful. Numerous scientific works question the point of using recumbent position during the delivery. The research cited by scientists – Wagner M [11] demonstrate that the advantages of the vertical positions (a sitting position, a squatting position, a standing position etc.) overweigh those of the recumbent position. Similarly, The Cochrane Library presents the results of the research conducted by Cochrane Pregnancy and Childbirth Group concerning beneficial influence of the vertical or lateral positions on the second stage of labour – Gupta JK and co-authors [15].

Wagner M [11] claims that a characteristic feature of a routinely conducted delivery is also the fact of ignoring a woman's subjectivity and her competence as well as limiting the possibilities of self made decisions about the course of the delivery. However, this situation is gradually changing. The patients, who are equal participants of the labour, have progressively wider possibilities of choosing the course of the delivery and how it will look like.

The research carried out in a number of centres highlight a positive role of a permanent presence of one person chosen by a woman in labour (so-called 'doulli') and the physical and moral support given by them – Klaus et al. [16]. Sendecka A [17] quote the research supporting the beneficial influence of a close relative's presence at the delivery. This thesis is also confirmed by the results of The Foundation Child Delivery in a Human Way 'Perinatal care…' [5]. The presence of a close relative gives support to a child giving woman, it does not only makes the situation human but also has a positive influence on staff's behavior.

Nowadays, the number of hospitals not offering the possibility of so-called 'family delivery' has decreased. However, there has been noticed an increase in number of hospitals for which the labour has become a source of income. Wasilewski P [18] states that as a justification for introducing illegal charges, which are paid by insured patients, the managers of the units under the research have pointed to a difficult and, not infrequently, dramatic financial situation of a hospital and its debt or they have emphasized that the offered services have gone beyond the standard; however, the standards in this field have in no way been established, neither in an administrational way nor in a civil-legal contract with the financing institutions.

A patient has the right to have their intimacy and dignity respected during the process of medical services and their special right is to have ensured only the presence of the necessary hospital staff without the third party while obtaining medical services. In order to ensure the realization of these rules and respecting this right it is beneficial to conduct midwifery procedures in isolated places, without the additional presence of unnecessary people. According to The Foundation Child Delivery in a Human Way 'Perinatal care…' [5] students and listeners have been present in 70% of midwifery and medical interventions. It ought to be highlighted that listeners and students on their training are treated by patients as 'the third party', that is, people who do not constitute the medical staff.

In the light of the above described facts it can be concluded that a change in medical personnel's approach concerning obeying patients' rights and, at the same time, broadening their knowledge on this subject should involve all medical environment and ought to be carried out in public by means of widely accessible sources such as the press, radio and television. The aim of such activities is spreading the knowledge about patients' rights as well as bringing a full respect of these rights among medical workers so that a noticeable progress in this area could be observed in future.

Conclusions

The analysis of the obtained data has authorized me to draw the following conclusions referring to the tested group: 1) patient's rights in a delivery room and a maternity ward are not respected to a satisfactory extent which is confirmed by the research results, 2) during the period of hospitalization

the patients aren't informed and they do not acquire almost any knowledge concerning their rights, 3) the patient staying in a maternity ward is in most cases only a passive receiver of medical service.

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Neurophysiologic studies of brain plasticity in children with cerebral palsy

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Abstract

The mechanisms of brain plasticity include: a change in the balance of excitation and inhibition; a long-term potentiation or long-term depression; a change in neuronal membrane excitability; the anatomical changes-formation of new axon terminals and new synapses. There are few tools for brain plasticity investigations. The utility of the neurophysiologic in the determination of brain reorganization and repair in patients with cerebral palsy (CP) are described. The authors discuss also their results of quantitative EEG, visual evoked potentials (VEPs) and somatosensory evoked potentials (SEPs) in children with CP. They showed the existence of brain reorganization and repair in children with CP.

Key words: brain plasticity, cerebral palsy, EEG, visual evoked potentials, somatosensory evoked potentials.

The term plasticity, derived from the Greek word "plaistikos" meaning "to form" refers to the brain's ability to learn, remember and forget as well as its capacity to reorganize and recover from injury [1,2]. Children have a remarkable ability to recover from early brain injuries as demonstrated by their ability to recover receptive language after left hemispherectomy performed for epilepsy as late as the second decade [3]. Mechanisms of plasticity include: first, a change in the balance of excitation and inhibition; second, a long-term potentiation (LTP) or long-term depression (LTD); third, a change in neuronal membrane excitability; fourth, the anatomical changes, which need a longer period of time.

In the 1980s and 1990s, a great deal of excitement was generated by new insights into new mechanisms of brain damage during hypoxia/ischemia [4-6]. It was well known that hypoxia/ischemia lasting more than a few minutes could cause irreversible brain damage. Further research indicated that reperfusion might cause more damage than simple hypoxia [6,7]. The mechanism of reperfusion injury is thought to involve the production of free oxygen radicals. The free radicals induce a chain reaction leading to a breakdown of the neuronal cell membrane (necrotic cell death). Further, free radicals are generated, causing damage in the original cell that spreads to neighboring cells [6]. The brain uses glucose as its primary energy source. Glutamic acid, or glutamate, is a common metabolite of glucose metabolism. Glutamate is involved in several metabolic processes in the brain. It plays a role as a precursor for the inhibitory neurotransmitter, γ-amino butyric acid (GABA). Elevated levels of glutamate are associated with increased brain activity. Furthermore, glutamate-induced excitotoxicity is a major mechanism by which neuronal loss may occur [7,8].

Cerebral palsy

Cerebral palsy (CP) is a chronic disorder of movement and posture caused by non-progressive damage to the developing brain, which occurs prenatally, perinatally or postnatally. Patients with CP may have some problems other than this motor impairment; mental retardation, epilepsy and sensory disturbance [9-12]. CP prevalence is increasing since more premature infants survive because of better neonatal care [9,12]. Spastic diplegia is the commonest form of CP as a results of injury to the periventricular leukomalacia (PVL) ring a temporal window of development that ends at 30-32 weeks [12]. A characteristic feature of PVL is the disruption of corticospinal axons, while the

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cortical pyramidal projection neurons are left intact and subsequently make aberrant intracortical axonal projections [13]. The rapidly expanding understanding of CNS axonal regeneration indicates that with early intervention there are realistic prospects of inducing corticospinal axons to regrow through the cystic areas of PVL and to find their appropriate targets [13]. Myelin is inhibitory to axonal growth but this should not pose an encumbrance to axonal regrow, since the corticospinal tract is poorly myelinated before term [14,15]. Recently, it has been demonstrated [16] that corticospinal axons are actively growing, innervating the spinal cord and expressing GAP43 during this period and are thus likely to have a high degree of plasticity. Interventions providing early regeneration of corticospinal projections and reinnervation of the spinal cord in preterm babies with PVL would be likely to reduce disability, not only by re-establishing the cortical input to spinal motor centers but also by facilitating their subsequent normal development.

There are few tools for brain plasticity investigations. Recently, it has been made possible for neural plasticity to be measured validly with transcranial magnetic stimulation techniques (TMS), and mapping EEG.

More recent studies have concentrated on the recovery and plasticity in the stroke patients [17,18,19,20]. Few investigations have been performed on children with cerebral palsy [21,22].

This review describes neurophysiological imaging studies of brain plasticity in children with CP.

EMG studies

Carr and colleagues [16] studied the central motor reorganization in subjects with hemiplegic CP. The corticospinal projections were investigated by using focal magnetic stimulation of the motor cortex. Reflex pathways were examined with digital nerve stimulation. In 64% of the patients, there was evidence of reorganization of central motor pathways. The clinical and neurophysiological findings revealed two different forms of reorganization. In both forms, focal magnetic stimulation demonstrated novel ipsilateral motor pathways from the undamaged motor cortex to the hemiplegic hand. Ipsilateral projections were not demonstrated from the damaged motor cortex. In these subjects, cross-correlation analysis and reflex testing suggested that corticospinal axons had branched abnormally and projected bilaterally to homologous motor neuron pools on both sides of the spinal cord. It was demonstrated that good function of the hemiplegic hand was associated with the presence of EMG responses in that hand following magnetic stimulation of the contralateral motor cortex. When EMG responses were absent, hand function was poor unless the subject had intense mirror movements.

Coherence EEG studies

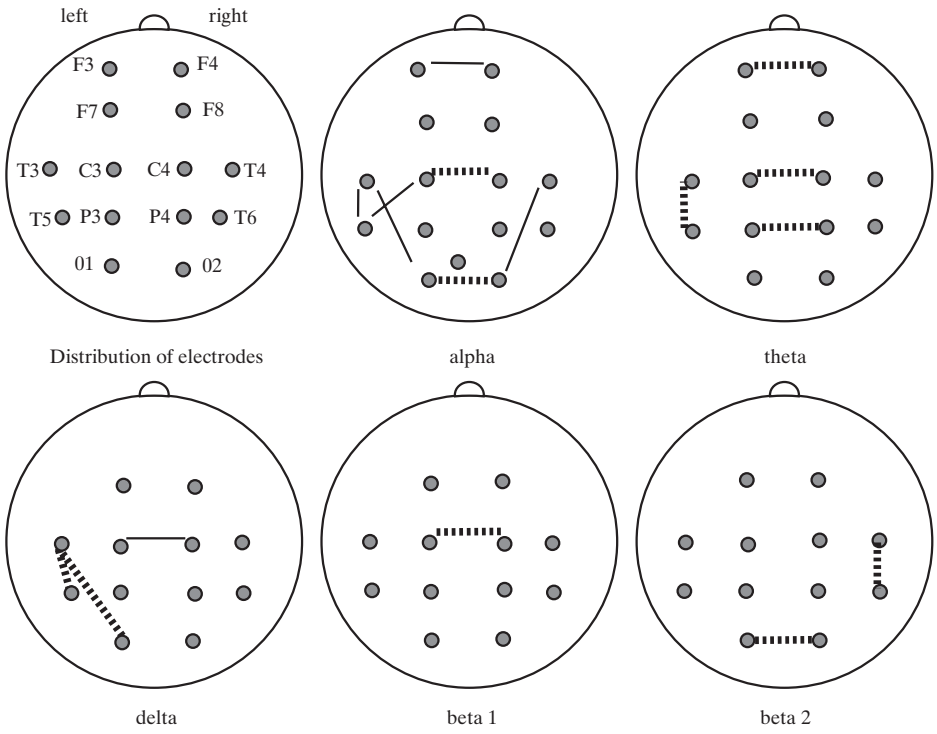
The EEG changes in CP patients generally reported are non-specific [10,23]. On the other hand a quantitative EEG (power spectra and coherence) provides objective measures in the search for global or focal abnormality which, if present, may signal an underlying organic process [24]. The coherence is a function of frequency [25]. Coherence is an amplitude independent measure of phase synchrony between EEG signals, reflecting functional interregional coupling and depending mainly on structural connections. The coherence values are interpreted in terms of differences in connectivity between brain structures [26]. Coherence has been found to vary with numerous disease states. Certain regions and frequency range increase in coherence in multi-infarct dementia, AIDS and mild head injury, while the decreases in Alzheimer's disease and depression [27,28].

Koeda and Takeshita [29] evaluated EEG spectral power density, interhemispheric (ICoh) and intrahemispheric (HCoh) coherence, and asymmetry of coherence between the right and left hemispheres in twelve children with spastic diplegia (SD). No significant differences were found in EEG spectral power density in these patients. A lower ICoh values at the occipital pair for the alpha band and a higher value at the frontal pair for the theta band in SD children. Higher HCoh in SD was pronounced in the left hemisphere for the delta, theta, and beta bands. On the other hand, there were no higher values in the control group. Higher HCoh asymmetry was exhibited in the left hemisphere in the control group, while very little asymmetry was found in the SD group. They suggested that these neurophysiologic abnormalities in preterm SD children corresponded neuroanatomically to callosal thinning and neuropsychologically to the visuoperceptual impairments. These findings are in agreement with our results [30].

We investigated the quantitative and coherence EEG on a larger group of patients with SD [10]. A group of twenty-nine children with SD was studied. EEG records were compared with healthy children with normal EEGs. For every subject, twenty artifact-free EEG epochs, each of 2 s duration were selected for spectral analysis and coherence functions. A significant decrease in power alpha at occipital derivations was demonstrated in the children with SD as compared with the control group. On the other hand, there was an increase of theta power and delta bands almost in all the leads. A significant decrease in ICoh coherence values in children with SD for the alpha and delta bands in the frontal and central leads as compared with the controls was observed (*Fig. 1*). In contrast, higher ICoh coherence values were detected at the frontal, central, parietal and occipital leads for the alpha, theta and beta 1 bands. Lower HCoh coherence values were noted in the patients at the temporal-occipital derivations. In contrast, we also detected higher HCoh values at the temporal and temporal-occipital derivations for the delta and beta bands. The results presented confirm the presence of anatomic-neurophysiologic abnormalities and the existence of compensatory mechanisms in children with SD.

Hemiparetic cerebral palsy (HCP) is one of the form of CP [9]. HCP often predicts which patients will develop cognitive disabilities and/or unprovoked seizures. We investigated the spectral and coherence EEG in children with spastic hemiplegia [30]. A group of fourteen children with right hemiparetic cerebral palsy (RHCP), ranging from 6-14 years of age was studied. The second group consisted of twelve children with left hemiparetic cerebral palsy (LHCP) of a similar age. In this study we found significant differences in the distribution of the alpha,

Figure 1. **Differences of interhemispheric (ICoh) and intrahemispheric (HCoh) in children with spastic diplegia (SD). Solid lines indicate significantly lower ICohs and HCoh in SD children compared to normal subjects. Dashes indicate significantly higher ICohs and HCoh in SD children compared to the control group (Kułak et al., 2003) [10]**



theta, delta and beta rhythm between HCP and control children over the left and right hemisphere. There were highly significant differences between the HCP and controls in the distribution of the theta rhythm over the left hemisphere. The lower ICoh at the temporal, parietal and occipital derivations in the alpha band implies hypoconnectivity between the right and left hemispheres and suggests hemistructural brain lesion. The HCoh asymmetry, which implies relative hypoconnectivity within the left hemisphere as compared with the right, suggests that functional hemispheric differentiation may be diminished. Our results suggest a possible increase in the plasticity of the brain in children with CP. We postulate that the rehabilitation efficacy of children with CP can be measured by EEG coherence.

Visual evoked potentials (VEPs) and somatosensory evoked potentials (SEPs) studies

Most studies [31,32] have proved VEPs to be accurate predictors of the outcome in term infants with hypoxic-ischemic encephalopathy. However, there are few reports [32] on VEPs in children with CP. More recently, Costa et al. [33] evaluated grating acuity in children with CP by sweep VEPs and found a high correlation between the grating acuity and the motor impairment classified by The Gross Motor Function Classification System. More recently, serial recordings have been performed in order to get information on the course of diseases or on intervention effects. Mild SEP abnormalities have been demonstrated not only in direct focal lesions of the cortex, but also as a consequence of lesions of other brain structures functionally linked to sensorimotor cortical areas [34]. SEPs have been shown to be of prognostic value after brain injury [34,35].

We evaluated VEPs and SEPs on 20 children with spastic CP, and 42 healthy children as controls [36]. All MR scans were obtained using a 1.5 T MR scanner. We found a significant difference in the latencies P100 between the CP and controls. No correlations between increased P100 latencies and asphyxia, prematurity, the CP severity, MRI findings and mental retardation were noted. A significant difference of N13-N20 conductions (SEPs) between the subjects with CP and the control group was found (*Tab. 1*). Furthermore, SEPs were positively correlated with mental retardation in CP children. It has been suggested that VEP latencies are valuable estimators of neuronal injury and even predictors of later intellectual performance [37]. In our study, latencies of VEPs were increased more frequently in the CP patients with alterations in the optic radiation by MRI.

In summary, children with CP have a remarkable ability to recover from early brain injures. At present the neurophysiologic techniques are able to present the plasticity in children with cerebral palsy. Quantitative EEG, VEP and SEP can be useful tools in the determination of these plasticities in children with CP. The authors have demonstrated the existence of two processes in the brain: damage and recovery.

***Table 1*. Somatosensory evoked potentials (SEPs) in children with cerebral palsy (CP) (n=20) and controls (n=42). Kułak et al., 2005 [36]**

CP		Controls	
Left stimulation/Latencies (ms)			
N9	9.14±0.99	N9	9.38±0.76
N13	12.04±1.12	N13	12.29±0.95
N20	17.93±1.50	N20	18.09±0.99
N25	21.32±1.62	N25	22.41±1.99
Right stimulation /Latencies (ms)			
N9	9.18±0.97	N9	9.41±0.72
N13	12.06±1.28	N13	12.32±1.03
N20	17.96±1.65	N20	18.41±1.06
N25	21.76±1.89	N25	22.61±2.12
Left stimulation/Conductions (ms)			
N9-N13	2.64±0.32	N9-N13	2.86±0.38
N13-N20	6.36±1.08*	N13-N20	5.75±0.29
Right stimulation/Conductions (ms)			
N9-N13	2.70±0.40	N9-N13	2.94±0.52
N13-N20	6.44±1.01*	N13-N20	5.85±0.64

* $p<0.05$ vs controls

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Time of cooing appearance and further development of speech in children with cerebral palsy

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Abstract

Purpose: **The aim of the study was to determine the significance of the time of cooing appearance for further development of speech in children with infantile cerebral palsy (CP).**

Material and methods: **The study was performed on a group of 46 children with the pyramidal form of CP, aged 3-16 years, treated in The Department of Pediatric Neurology and Rehabilitation, Medical University of Białystok. It included a logopaedic assessment and a history of speech development obtained from mothers.**

Results: **Speech development in CP children varied according to the time of cooing appearance. Particular difficulties were observed in children with delayed cooing, who usually said their first words between 2 and 5 years of age, sentences between 3 and 5 years or even later (8 or 11 years of age); 35% of these children did not use sentences at all. Moderate and severe dysarthria, limited lexical and grammatical development and problems with speech understanding of varied degree were observed.**

Conclusions: **Delayed cooing in CP is an important prognostic sign of further speech retardation and indicates the necessity of early logopaedic rehabilitation.**

Key words: cooing, speech development, infantile cerebral palsy.

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Introduction

The development of speech in CP children is usually retarded [1]. The most common speech disorder is dysarthria, observed in 50-80% of patients [2-4]. In dysarthric children, cooing is late, very poor, monotonous, long-lasting and does not assume more complex forms [5].

It is assumed that pre-verbal behaviours have a preparatory role in the development of proper speech. In literature, this period is defined as the preliminary phase in speech development and regarded as a "drill" of speech articulation and phonematic hearing [6]. It seems that the opinion on the lack of continuity between cooing and speech has drawn scientists' attention from that issue [7] and thus it is still the least scientifically described problem of infancy [8].

At present, cooing is gaining greater significance. Acoustic analyses prove that cooing bears a structural similarity to the language [9]. Cooing may reflect the first signs of speech development [10]. Researchers express the view that there is cooing-related continuity of speech development [11], pointing at the correlation between delayed cooing and further speech development [12].

The aim of the study was to determine the significance of the time of cooing appearance for further development of child's speech.

Material and methods

The study was performed in a group of 46 children, 3-16 years of age, with pyramidal form of CP treated in The Department of Pediatric Neurology and Rehabilitation, Medical University of Białystok.

Data concerning the time points of the respective speech stages were based on a history obtained from the mother. A logopaedic assessment of the speech included: speech intelligibility, articulation, articulatory motorics, reflexes, breathing, phonation, prosody, vocabulary, grammar, understanding.

Table 1. **Time of appearance of the first words and sentences in children with timely cooing (N=23)**

Age	Words		Sentences	
	N	%	N	%
Approx. 1 year	21	91.3	-	-
Approx. 2 year	2	8.7	17	74
Approx. 3 year	-	-	3	13
None	-	-	3	13

Table 2. **Time of appearance of the first words and sentences in children with delayed cooing (N=23)**

Age	Words		Sentences	
	N	%	N	%
Approx. 1 year	2	8.7	-	-
Approx. 2 years	10	43.5	2	8.7
Approx. 3 years	4	17.4	2	8.7
Approx. 4 years	2	8.7	1	4.3
Approx. 5 years	2	8.7	2	8,7
Approx. 8 years	-	-	2	8.7
Approx. 11 years	-	-	1	4.3
None	3	13	13	56.5

Table 3. **The current level of speech development in children with timely cooing (N=23)**

Severity of speech delay	Dysarthria		Lexicon		Grammar		Speech understanding		General development of speech	
		%	N	%	N	%	N	%	N	%
No	7	30.4	13	56.5	11	47.8	18	78.3	3	13
Mild	9	39.1	5	21.7	9	39.1	5	21.7	15	65.2
Moderate	7	30.4	3	13	2	8.7	-	-	5	21.7
Severe	-	-	2	8.7	1	4.3	-	-	-	-

Robertson's dysarthria scale (1986) was used to determine the degree of motor speech dysfunction (dysarthria). General level of speech development with all its aspects was also assessed.

Results

The study group of 46 CP children included 17 (36.9%) with hemiplegia, 16 (34.8%) with diplegia and 13 (28.3%) with tetraplegia. In 24 children (52.1%) intellectual development was normal, 5 (10.8%) had slight mental impairment, 8 (17.4%) – moderate impairment, while 9 (19.6%) – substantial and severe. Epilepsy occurred in 15 children (32.6%), 3 (6.5%) had hearing disorders.

Twenty-one children (91.3%) with a timely history of cooing said their first words around 1 year of age, 2 (8.7%) around 2 years of age; 17 (74%) uttered whole sentences at the right time (by 2 years of age), 3 (13%) by 3 years; 3 children (13%) used no sentences (*Tab. 1*).

Among the children with delayed cooing, only 2 (8.7%) uttered the first words at the right time, 10 (43.5%) in the 2nd year of life, 4 (17.4%) in the 3rd year, 2 (8.7%) in the 4th year, 2 (8.7%) in the 5th year, 3 (13%) did not say a word; 2 children (8.75%) began to utter sentences at the right time, 2 (8.7%) in the 3rd year, 1 (4.3%) in the 4th year, 2 (8.7%) in the 5th year, 2 (8.7%) in the 8th year, and even one (4.3%) in the 11th year; 13 children (56.5%) did not use sentences (*Tab. 2*).

Among the children with timely cooing, 7 (30.4%) had no dysarthria, in 9 children (39.1%) the disorders were slight, in 7 (30.4%) – moderate; no severe cases of dysarthria were noted. Vocabulary was adequate in 13 children (56.5%), slightly limited in 5 (21.7%), moderately in 3 (13%) and deeply limited in 2 (8.7%). In 11 children (47.8%) no grammatical abnormalities were noted, in 9 (39.1%) the abnormalities were slight, in 2 (8.7%) – moderate, in 2 (8.7%) serious. Speech understanding was generally normal in 18 children (78.3%) and slightly disturbed in 5 (21.7%). General development of speech was normal in 3 (13%) of the children, slightly disturbed in 15 (65.2%) and moderately disturbed in 5 (21.7%). No severe defects of general development of speech were observed (*Tab. 3*).

In the group of children with delayed cooing, dysarthria was not observed in only 1 child (4.3%), 5 (21.7%) had slight, 9 (39.1%) moderate and 8 (34. 8%) severe dysarthria symptoms. Vocabulary development was in the norm in 3 children (13%), slightly limited in 4 (17.4%), moderately limited in 5 (21.7%); in 11 cases (47.8%) severe disorders were observed. Speech was grammatically correct in 1 case (4.3%), in 5 patients (21.7%) grammatical abnormalities were slight, in 3 (13%) – moderate, in 14 (60.9%) severe. Three children (13%) had no problems with speech understanding, in 10 (43.5) the problems were slight, in 3 (13%) – moderate, in 8 (34.8%) – serious. General speech development was abnormal in all the children, in 5 (21.7%) the defects were slight, in 7 (30.4%) – moderate and in 11 (47.85) – severe (*Tab. 4*).

The list of disturbances concomitant with delayed and timely cooing is presented in *Tab. 5*.

Timely cooing was most common in children with hemiplegia (43.4 %) and diplegia (39.1%), and less common in those with tetraplegia (17.4%); it was most frequent in 17 children (73.9%) with normal intellectual development, but it also appeared in 3 (13%) slightly impaired children, in 2 (8.7%) moderately in 1 (4.3%) severely or substantially retarded, in 16 epilepsy-free children (69.6%) and in 7 (15.2 %) epileptic patients; none had hearing disorders.

Table 4. **The current level of speech development in children with delayed cooing (N=23)**

Severity of speech delay	Dysarthria		Lexicon		Grammar		Speech understanding		General development of speech	
	N	%	N	%	N	%	N	%	N	%
No	1	4.3	3	13	1	4.3	3	13	-	-
Mild	5	21.7	4	17.4	5	21.7	10	43.5	5	21.7
Moderate	9	39.1	5	21.7	3	13	3	13	7	30.4
Severe	8	34.8	11	47.8	14	60.9	7	30.4	11	47.8

Table 5. **Time of cooing appearance vs CP mental impairment, hearing defects and epilepsy**

Time of cooing	Types of CP						Mental retardation								Epilepsy				Hearing defects			
	Hemiplegia		Diplegia		Tetraplegia		None		Mild		Moderate		Severe		No		Yes		Yes		No	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Normal N=23	10	-	9	39.1	4	17.4	17	73.9	3	13	2	8.7	1	4.3	16	69.6	7	15.2	-	-	23	100
Delay N=23	7	30.4	7	30.4	9	39.1	7	30.4	2	8.7	6	26	8	34.8	15	65.2	8	34.8	3	13	20	87

The group of children with delayed cooing included: 9 (39.1%) with tetraplegia, 7 (30.4%) with hemiplegia and 7 (30.4%) with diplegia, 17 (30.4%) without mental impairment, 2 (8.7%) with slight impairment, 6 (26%) with moderate, 8 (34.8%) with substantial and severe mental retardation, 15 (65.2%) without epilepsy, 8 (34.8%) with epilepsy, 3 (13%) with hearing disorders and 20 (87%) with normal hearing.

Discussion

The study outcome demonstrates that speech development in CP children varies according to the time of cooing appearance. Special difficulties occurred in the group of children with delayed cooing. They said their first words usually between 2 and 5 years of age, sentences between 3 and 5 years, and even 8 or 11 years. Thirteen children (56.5%) did not utter a sentence, including 3 (13%) remaining at the stage of vocalisation. Moderate and severe dysarthria, substantial limitations of vocabulary and grammatical development, as well as speech understanding disorders of varied degree were noted in these children. Speech development abnormalities in this group of children are particularly serious and may last long; sentences may appear especially late. This confirms the necessity of often arduous and long-lasting speech therapy, which should not be discontinued.

Children with timely cooing acquired speech more easily, although not without problems. They also showed dysarthric symptoms and abnormalities in general development of speech but they were rather not severe.

Oller et al. [9], studying 3400 infants, revealed that children with delayed cooing had poorer vocabulary compared to normally developing children at the age of 18, 24 and 30 months. The authors suggest that this factor, a likely prognostic sign of further delay of speech development, can be effectively monitored by parents.

The most severe form of CP, i.e. tetraplegia, mental impairment (particularly the more severe one) and hearing defects are more common in the group of children with delayed cooing, as compared to those with timely cooing.

Oller et al. [13] investigated the frequency of cooing production in the group of children with retarded cognitive development, finding low correlation between cooing and developmental age. This, as they suggest, indicates actual independence of cooing from cognitive development in intellectually retarded children [13].

Epilepsy was observed in children both with timely and delayed cooing. Lack of correlation between cooing and epilepsy may result from the fact that epilepsy in CP usually appears later than cooing. In the study of Kułak et al. [14], epilepsy appeared between 3 and 5 years of age in children with hemiplegia and diplegia, and around one year of age in the case of tetraplegia.

Hearing defects were found only in 3 children and all of them had a history of delayed cooing. Eilers et al. [15] observed that deaf children were not able to produce coo sounds up to 11 months of age or later, often until 3 years. The authors indicate that lack of cooing above month 11 of age should be considered a serious indicator of the risk of hearing disorders.

Scheiner et al. [16] suggest that normal hearing is not the only factor necessary to produce pre-verbal utterances. Comparing vocalisations of well hearing and poorly hearing children (in the 1st year of age), they found that both groups of children had the same repertoire, with no differences in the time of preverbal productions; structural differences could be noticed only in crying.

Oller et al. [17], studying perinatal risk children, found that at the time of the research half of the patients with delayed cooing were burdened with serious medical diagnoses. As suggested

by the authors, late cooing may prognosticate later developmental dysfunctions reflected in speaking, language and reading.

The current study revealed that further speech development in children with delayed cooing was seriously retarded. Moreover, children with delayed cooing, as compared to those with timely cooing, more frequently had other developmental defects (severe CP – tetraplegia, mental impairment, hearing disorders).

In summary delayed cooing in CP children is an important prognostic factor of further speech retardation. Parents should be made particularly aware of the significance of this period as they have the greatest possibility of cooing monitoring. All CP children with a positive history of delayed cooing should undergo early rehabilitation of speech; for all the others preventive care is recommended.

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The influence of the dietary habit on lipoprotein density in blood serum of men from Podlasie region

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Abstract

In the years 1987-1998 we conducted examined a group of 556 men three times. The nutritional status was evaluated as well as total cholesterol, HDL- and LDL-cholesterol and triglycerides concentration in blood serum and it allowed to evaluate the influence of nutrition on lipid status. The relationships between diet composition and lipid levels in the whole period of 9 years were evaluated using multidimensional linear regression analysis.

Among examined men, depending on the period of the study, values of serum total cholesterol (C<200 mg/dk) favourable from the standpoint of arteriosclerosis prevention were noted in only 36-39%, with LDL-cholesterol below 130 mg/dl in 35-48%, HDL-cholesterol over 35 mg/dl in 87-94% and triglyceride levels below 200 mg/dl in 81-83% of the studied men. Among 6 basic nutrients of the diet, only plant fat was significantly influencing the concentration of triglycerides in blood serum – an increase of its consumption caused the decrease of triglyceride level. It has been proven that increasing amount of alcohol in the diet led to the increase of HDL-cholesterol in blood serum. Blood serum lipids were significantly influenced by BMI. Increased body mass index significantly influenced the concentration of total cholesterol, LDL-cholesterol and triglycerides in blood serum. In examined men with the increase of body mass index the HDL-cholesterol concentration was decreasing.

Summing it up-it has been shown that the diet of examined men directly and significantly influenced lipid concentration in blood serum, and it also had an indirect influence on lipid concentration, through body mass regulation, which significantly influenced its concentration.

Key words: men, the dietary habit, cholesterol and its fractions, body mass index.

Introduction

Considering health problems according to the dietary habit arises from increasing part of diseases depending on improper nutrition among world population [1-3].

Increased mortality of middle-aged men in Poland [4,5], at the time of elevated vital activity, including work, was the reason which we examined health of men for. The aim of this study was to evaluate, in a prospective study, lipoprotein status in men, inhabitants of Podlasie region and refer it to the dietary habit.

Material and methods

The studies were conducted in the period 1987-1998 on a group of 556 working men, aged 25-54 at the beginning of the study. The study was conducted in three periods. The first screening was performed in the years 1987-1989, the second one in 1991-1993 and the third in 1996-1998. In all three periods 556 men (55,8%) were participating. To evaluate daily nutrition, a 24-hour consumption questionnaire was used, according to the method accepted by National Food and Nutrition Institute in Warsaw. To calculate the energy value of the diet and the content of nutrients and groups of products in it, tables containing energy and nutritive value of 190 products and meals from National Food and Nutrition Institute were used.

Ensuring during 9 years of study marking parameters of lipoprotein status with the same method was hard to do accord-

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ing to objective reasons. With the need of implementation a new method, each analysed parameter was marked in a particular number of serum samples, using new method and previously used method, and then new method was adjusted to get identical values using both methods. Additionally, in a statistical elaboration of the outcomes, they were identified by the year of their analysis.

The concentration of triglycerides was marked in blood serum in the first study by using a set of reagents Technicon Instruments Corporation Tarrytown. In 2nd and 3rd study Ciba-Corning Diagnostics Corp. set was used.

The concentration of total cholesterol in 1st and 2nd study was marked in blood serum by Libermann-Burchard method [6]. In 3rd study the concentration of total cholesterol in blood serum was marked by enzyme method, using reactants from Ciba Corning Diagnostics Corp.

Calculation of cholesterol HDL fraction in blood serum in 1st and 2nd study was done by precipitation method according to Lopes-Virelle [6,7]. In 3rd study, the concentration of cholesterol HDL fraction was calculated by enzyme method by using set of the firm Ciba-Corning Diagnostics Corp.

The concentration of cholesterol LDL fraction in blood serum was calculated using the Friedewald formula: cholesterol LDL = total cholesterol – cholesterol HDL – 0.2 x triglycerides.

In a statistical elaboration of outcomes a model proposed by van't Hof [8] was used, and it is based on the analysis "age-period-cohort" [9,10]. In this model there are three basic independent variables: age of the respondent, the period of study and the attachment to particular birth cohort. Beside these three independent variables there were also nutritional factors stated by authors [11,12], which affect the concentration of lipids in blood serum.

Multidimensional regression analysis was conducted by using SAS (Statistical Analysis System ver. 6.11) with the use of GENMOD procedure. Verification of statistical hypotheses was conducted with the level of significance $\alpha=0.05$.

Results

Accepted statistical method for the elaboration of outcomes allowed to include the fact of variability, arising from the use of different laboratory methods, because of which change of those methods did not influenced examined relations between nutrition and the total concentration of lipids. Because we couldn't exclude the influence of the changed method of calculation of lipids on obtained values, the conclusions about trends of time change were not drawn. However, the scope of appearing lipid concentrations may bring some information about mean values of their concentration in men in whole time of the study.

The values of mean concentration of particular lipoproteins in blood serum of men in next three studies are presented in *Tab. 1*.

Mean concentration of total cholesterol in blood serum in the period of 9 year observation of men was from 213.4 to 217.4 mg/dl. Values of cholesterol LDL fraction were unbalanced from 133.9 to 142.4 mg/dl, and changes of the concentration of cholesterol HDL fraction from 46.3 to 51.2 mg/dl. The concentration of triglycerides during whole period of study was unbalanced from 144.1 to 148.9 mg/dl.

Table 1. **The concentration of total cholesterol, cholesterol LDL and HDL fractions and triglycerides in blood of 556 men during next three studies in 9 years of observation**

Examined lipoprotein		I study	II study	III study
Total cholesterol (TC) mg/dl	Mean	215.4	217.4	213.4
	SD	35.2	37.7	38.8
Cholesterol LDL fraction (LDL-C) mg/dl	Mean	138.8	142.4	133.9
	SD	33.6	34.8	34.7
Cholesterol HDL fraction (HDL-C) mg/dl	Mean	46.8	46.3	51.2
	SD	9.0	9.1	14.1
Triglycerides (TG) mg/dl	Mean	148.9	144.1	142.2
	SD	92.1	84.4	91.5

Table 2. **The percent of men with normolipidemia and with different stages of hiperlipidemia among 556 men during 9 years of observation**

Values of lipoproteins concentration			I study	II study	III study
Normolipidemia	TC<200 mg/dl	n	184	163	199
	TG<200 mg/dl	%	33.1	29.3	35.8
Hypercholesterolemia mild	200 mg/dl≤TC<250 mg/dl	n	211	219	202
	TG<200 mg/dl	%	37.9	39.4	36.3
Hypercholesterolemia severe	TC≥250 mg/dl	n	64	68	59
	TG<200 mg/dl	%	11.5	12.2	10.6
Hypercholesterolemia mixed	TC≥200 mg/dl	n	80	89	76
	TG≥200 mg/dl	%	14.4	16.0	13.7
Hipertriglyceridemia	TC<200 mg/dl	n	17	17	20
	TG≥200 mg/dl	%	3.1	3.1	3.6

TC – Total cholesterol, TG – triglycerides

The percent of men with normolipidemia and with different stages of hiperlipidemia among 556 men in 9 years of observation is presented in *Tab. 2*.

During 9 years of observation normolipidemia (total cholesterol less than 200 mg/dl and the level of triglycerides less than 200 mg/dl) occurred only in 29.3%-35.8% of men (depending on the period of study).

The influence of the energy value of 24-hour consumption on the concentration of total cholesterol, cholesterol LDL and HDL fractions and triglycerides is presented in *Tab. 3*.

The energy value of the 24-hour consumption of men did not significantly influence the concentration of the total cholesterol, cholesterol LDL and HDL fractions and triglycerides in their blood serum.

The influence of nutrients on total cholesterol concentration, cholesterol LDL and HDL fractions and triglycerides is presented in *Tab. 4*.

Among 6 basic nutrients, only plant fat may influence total cholesterol concentration in blood, but because of $p=0.06$ it has to be well considered. None of analysed basic nutrients

Table 3. **The influence of the energy value of 24-hour consumption on the concentration of total cholesterol, cholesterol LDL and HDL fractions and triglycerides during 9 years of observation of men**

Dependent variables	Independent variables	Age Δ=1.0 year	Differences between periods		Differences between cohorts		Diet energy (kcal) Δ=1.0
			I-II	I-III	A-B	A-C	
Total cholesterol	Δ	0.85	-1.36	-9.62	2.31	5.34	-0.0005
	p	0.09	0.58	0.04	0.72	0.60	0.57
LDL–cholesterol	Δ	0.91	-0.14	-13.2	7.26	12.20	-0.001
	p	0.04	0.95	0.001	0.19	0.17	0.24
HDL–cholesterol	Δ	-0.23	0.50	6.83	-4.44	-2.60	0.0003
	p	0.04	0.43	0.00001	0.002	0.23	0.31
Triglycerides	Δ	0.91	-9.27	-14.78	1.94	-8.38	0.002
	p	0.45	0.09	0.19	0.90	0.73	0.39

Table 4. **The influence of nutrients from the diet of men on total cholesterol concentration, cholesterol LDL and HDL fractions and triglycerides**

Independent variables / Dependent variables (mg/dl)		Age Δ=1.0 year	Differences between periods		Differences between cohorts		Animal protein Δ=1.0 g	Plant protein Δ=1.0 g	Animal fat Δ= 1.0 g	Plant fat Δ= 1.0 g	Total carbohydrates Δ=1.0 g	Pure alcohol (96%) Δ= 1.0 g	Body Mass Index (BMI) Δ=1.0 kg/m^2
			I-II	I-III	A-B	A-C							
Total cholesterol concentration	Δ	0.78	-1.62	-9.99	2.96	6.64				-9.09			1.43
	p	0.12	0.52	0.04	0.64	0.51				0.06			0.00001
LDL-cholesterol	Δ	0.90	-0.20	-13.61	7.33	12.60							0.76
	p	0.04	0.93	0.002	0.19	0.16							0.01
HDL-cholesterol	Δ	-0.18	0.63	7.03	-4.48	-3.04						0.11	-0.53
	p	0.07	0.31	0.00001	0.0008	0.14						0.0001	0.00001
Triglycerides	Δ	0.59	-10.72	-17.39	6.05	-1.33			0.07	-0.24			6.61
	p	0.60	0.05	0.11	0.69	0.95			0.07	0.02			0.00001

had significant influence on cholesterol LDL fraction in blood serum. In the case of cholesterol HDL fraction only alcohol has had a significant influence on its concentration. With growing amount of alcohol consumed there was an increase of cholesterol HDL fraction concentration. The amount of consumed by men plant fats has had a significant influence on triglycerides concentration in blood serum. Increasing consumption of plant fats was lowering the triglycerides concentration in blood serum of men.

The increase of body mass index (BMI) was significantly influencing the increase of total cholesterol, cholesterol LDL fraction and triglycerides in blood serum of men. In examined men with the increase of body mass index value, the concentration of cholesterol HDL fraction in blood serum was decreasing.

Discussion

In our own study, the percentage of men with needed, from the standpoint of arteriosclerosis prevention, concentrations of particular lipids were small and they were closing to values presented in other national essays. In Pol-MONICA [13] study, an evaluation of lipids of men from Warsaw, aged identically as men during our 3rd study in the years 1996-98, was conducted in 1984. The study of Pol-MONICA presents the occurrence of normolipemia in 31% of examined men, while in our study it was present in 36% of men (the evaluation of normolipidemia according to the same criteria). Also concentrations of total cholesterol and its LDL and HDL fractions in both studies were very similar. The differences were observed in case of triglycerides, that is, in corresponding age groups in our study mean concentration was 142.2 mg/dl, and in Pol-MONICA study – 171.6 mg/dl [14].

Performed research showed, that only plant fat consumption has had a significant influence on triglycerides concentration. With the increase of consumption of plant fats, the concentration of triglycerides in blood serum of examined men was decreasing. Several papers and essays show the influence of unsaturated fatty acids on lipids, particularly the decrease of triglycerides in blood serum with an increased consumption of those fatty acids [15,16]. However, publications sometimes

present statements, in which for example, after examination of 2900 of United States of America habitants of different sex, age and race, the influence of total fats consumption, saturated and unsaturated fats and carbohydrates on the concentration of cholesterol LDL and HDL fractions and triglycerides was not observed [17]. In DRECAN-Study, in observations including habitants of united Germany in the years 1990-91, was not observed, that changes of the diet in a consequence of unity have the influence on the concentration of lipoproteins in blood serum [18]. A few population studies conducted in Poland conclude also, that evaluations of nutrition used nowadays, allowed to find the influence of only few nutritional factors on lipoproteins concentration [19,20]. In men examined in Pol-MONICA study [20], nutritional factors were responsible only for 0.9-2.4% of lipoproteins concentration variance, however, authors do not show the influence of diet composition on the concentration of total cholesterol and its LDL and HDL fractions.

In our study we demonstrated, that increasing alcohol consumption caused the increase of the concentration of cholesterol HDL fraction in blood serum. Among other papers referring to nutrition, conducted in our country, the influence of alcohol consumption on the concentration of lipoproteins was evaluated in the Pol-MONICA study, showing the relationship between the features [21]. In the studies on Finland, Italy and the Netherlands habitants, which evaluated the influence of alcohol consumption on the concentration of lipoproteins it was ascertained, that increasing alcohol consumption was increasing cholesterol HDL fraction, but it has not had an influence on total cholesterol concentration [22]. However, based on full knowledge in this field of study, including other disadvantageous results of alcohol consumption, there is no reason, also according to World Health Organization experts, to propagate moderate alcohol consumption [23].

The examination of men showed, that with the increase of body mass index (BMI) the concentration of triglycerides, total cholesterol and its fraction LDL was increasing, and the concentration of cholesterol HDL fraction in blood serum was decreasing. The influence of body mass or its measurements, like overweight and obesity, and particularly cholesterol HDL fraction, were described relatively long ago [22,24,25]. In men examined in selected european countries, the increase of BMI index has had a significant influence on the increase of total cholesterol and decrease of cholesterol HDL fraction [22]. The body mass index of men examined in the 70s in a Coronary Prevention Program, was positively correlated with triglycerides and additionally with total cholesterol only in a group aged 20-39 years and negatively with cholesterol HDL fraction [26]. Also in subsequent Pol-MONICA studies [27], the increase of total cholesterol and its LDL fraction and triglycerides and the decrease of cholesterol HDL fraction with increasing BMI value were proven. The frequency of abnormal cholesterol and its fractions and triglycerides concentrations occurrence was higher among obese people than among people with correct body mass index [28].

Conclusions

The evaluation of lipoprotein density in blood serum showed great threat of arteriosclerosis development in a group of men, inhabitants of Podlasie region, because during 9 years of observation in 64-71% of men improper values of lipoprotein values were observed. The study shows that this threat may be beneficially modified by the increase of plant fat consumption and the decrease of the body mass index.

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The cortical evoked potentials in children with Developmental Coordination Disorder (DCD)

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Abstract

Purpose: Evoked potentials were recorded in patients with DCD to evaluate the integrity the afferent pathways and to rule out the presence of any neurological lesions.

Material and methods: Two boys: 5 and 16 years old with recognized DCD were examined. Battery of tests: short-latency somatosensory evoked potentials (SEP), pattern-reversal visual evoked potentials (VEP), cognitive event-related potentials (CERP) and EEG were recorded. CT and neuropsychological assessment were also performed.

Results: N20 and P25 latencies and also central conduction time of SEPs in both patients were longer. N9, N11, N13 latencies were normal. VEP, CERP, EEG and neuroimaging scans were normal.

Conclusions: Relationship among perceptual – motor skills, cognitive impairment and electrophysiologic findings in children with developmental dyspraxia are discussed. The disturbances of the integrity of the afferent pathways could to be one of many causal factors. Further researches are required to determine the specific source of the neurological deficit of clumsy children.

Key words: developmental dyspraxia, developmental coordination disorder, clumsy children, evoked potentials.

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Introduction

Developmental Dyspraxia has been recognized since very early twenty century, when Collier first described it as 'congenital maladroitness'. In 1937 Dr Samuel Orton declared it to be 'one of the six most common developmental disorders, showing distinctive impairment of praxis'. Since then it has been described and labeled by many, such as A. Jean Ayres, who in 1972 called it a disorder of Sensory Integration, or Dr Sasson Gubbay who in 1975 called it the 'Clumsy Child Syndrome' [1]. Other labels have included developmental disorder, sensorimotor dysfunction, minimal brain dysfunction, motor sequencing, minimal cerebral dysfunction, or sensory integration problems, clumsy children syndrome and most recently Developmental Coordination Disorder [2-4]. Although the diagnostic criteria appear to be similar, we are left with the question: are children who receive the diagnosis developmental coordination dyspraxia the same as those who receive the other diagnoses [3].

The American Psychiatric Association classifies these children and adolescents as having developmental coordination disorder (DCD), defined as "marked impairment in the development of motor coordination" [5]. It is estimated that 6% of children ages 5 to 11 in The United States have DCD [5] or 2-10% in Great Britain [6].

Dyspraxia can be defined as motor difficulties caused by perceptual problems, especially visual-motor and kinesthetic motor difficulties [7]. DCD is a disorder characterized by an impairment in the ability to plan and carry out sensory and motor tasks. Generally, individuals with the disorder appear "out of sync" with their environment. Symptoms vary and may include poor balance and coordination, clumsiness, vision problems, perception difficulties, emotional and behavioral problems, difficulty with reading, writing, and speaking, poor social skills, poor posture, and poor short-term memory. Although individuals with the disorder may be of average or above average intelligence, they may behave immaturely [2,7]. There is no consensus whether DCD is a physiological or developmental disorder or, if the disorder is physiological, whether it is mul-

Table 1. **SEP results of patient M.S.**

Latency (ms)	**N9**	**N11**	**N13**	**N20**	**P25**	**N9-13**	**N13-N20**
N.median right	7.85 ms	10.1 ms	11.0 ms	30.3 ms	38.1 ms	3.15 ms	19.3 ms
N.median left	9.75 ms	12.7 ms	15.6 ms	29.4 ms	34.9 ms	5.85 ms	13.8 ms

tisensory or unisensory. Children and adolescents with DCD may have problems with gross motor skills, fine motor skills, or both. Some have difficulty planning movements (dyspraxia) and executing them, others have difficulty planning movements but not executing them, and others have difficulty executing movements but not planning them. Children and adolescents with DCD should not be confused with those who do not perform motor skills as well as their peers. Children and adolescents with DCD have extreme difficulty acquiring new motor skills. Practice can help them, but it must be structured in specific ways to be effective. Motor skill development is slow for children and adolescents with DCD, and perceptual motor skills that are complex and/or require precise perception, such as writing between the lines on a sheet of paper, can be very difficult [2,3]. Children and adolescents with motor coordination problems are at risk for low academic performance, poor self-esteem, and inadequate physical activity participation. Unless there is intervention, their problems are likely to continue through adolescence. These children and adolescents are likely to avoid physical activity and experience frustration if they are forced to participate. Motor coordination problems do not resolve themselves, and children and adolescents do not outgrow them [8]. The assessment, etiology and treatment of DCD are discussed. Changes of cortical evoked potentials have been find in many disturbances. These electrophysiological tests seems to be useful also in children DCD. We recorded multimodal evoked potentials: visual somatosensory and cognitive event potentials in children with DCD to rule out the presence of any neurological lesions and to evaluate the integrity the afferent pathways.

Material and methods

Two boys 16 and 5 years old, with recognized DCD were examined. Neurological examination was normal. Assessment involved obtaining a detailed developmental history of the child and psychological profile. Neuroimaging was also performed. We recorded battery of electrophysiological tests including visual evoked potentials (VEP), short-latency somatosensory evoked potentials (SEP), cognitive event-related potentials (CERP) and electroencephalography (EEG).

Four-channel Sapphire Premiere MEDELEC was used for evoked potentials recording. Tests were performed according to standards accepted by most clinical laboratories [9-11]. In VEP checkboard pattern of black and white squares at reversal frequency of 2 Hz was presented. The responses were recorded from silver chloride electrodes on the scalp in occipital region in point Oz with referral electrode in Cz. During uninterrupted stimulation blocks of 128 responses were averaged. Peaks N1, P100 and P2 were analyzed [9,10]. In short latency SEP electrical stimulation of median nerve in at frequency 5 Hz and intensity ranges from 10 to 20 mV was used. The responses were recorded from electrodes located over ipsilateral Erb's point, the seven cervical vertebrae (C7), the second cervical vertebrae (C2) and contralateral somatosensory cortex (C3 or C4). The reference electrode was located in mid-front side (Fz). We used averaging 1000 responses. Latencies of potentials N9, N11, N13, N20 and P25 were analyzed [10-12]. In AudioCERP/P300 wave/stimuli frequent – 1000 Hz and rare – 2000 Hz, duration 50 ms and intensity 70 dBHL were presented in headphones. Rare stimuli were 15%, interstimulus interval 1.5 ms. The responses were recorded from active electrodes over the scalp: Cz and Fz with referral electrodes on earlobes. Peaks N1, P2, N2, P3 were analyzed [10,13].

Results

CASE 1. M.S., sixteen years old boy, from first normal pregnancy, delivery with caesarean section, 10 points of Apgar scale, body weight 3820 g. The psychomotor development and intellectual ability were normal, although from early childhood clumsiness, poor posture, coordination balance, walk awkward was observed. He also demonstrated difficulty in self-care tasks (dressing, using utensils) and academic tasks (handwriting, painting, organizing seatwork, gym class). No neurological and mental disorders were noted in his family.

Conventional neurological examination was normal. We observed slower movement time, clumsy movements of hands, difficulties in visual-motor coordination, problems with precise manual skills, rhythm of movements, repetition of learned tasks. He had difficulty in planning movements. Laboratory tests, computer tomography (CT) of CNS and EEG were normal. In psychologic assessment intellectual ability was average, visual-spatial disturbances without focal agnosia was found.

SEP results are presented in *Tab. 1*. The latencies of cortical component N20 and P25 were prolonged. Central conduction time (N13-N20 interlatency) was also prolonged. Latencies P100 component of VEP were slightly prolonged (left eye – 117.8 ms, right eye 114.8 ms), amplitudes (left eye – 7.69 μV, right – 7.66 μV) were low. CERP latencies: N1 – 116 ms, P2 – 203 ms, N2 – 258 ms and P3 (P300) – 333 ms were in normal range.

CASE 2. K.B., five years old boy was born from second normal pregnancy, delivery natural, 9 points of Apgar scale, body weight 3250 g. Hiperbilirubinenia since 4 day to 7 day of neonatal period, phototherapy was used. The motor development was late: sitting in 10 month, walking in 16 month of life. From early childhood he demonstrated clumsiness, difficulty in self-care tasks like dressing, using utensils and manual skills like

Table 2. **SEP results of patient K.B.**

Latency (ms)	**N9**	**N11**	**N13**	**N20**	**P25**	**N9-13**	**N13-N20**
N.median right	7.25 ms	8.65 ms	8.80 ms	16.90 ms	30.30 ms	1.55 ms	8.1 ms
N.median left	7.25 ms	8.70 ms	9.80 ms	18.90 ms	27.90 ms	2.55 ms	9.1 ms

throwing or catching a ball, holding properly a pencil, painting and drawing. He was confused about which hand to use.

Conventional neurological examination was normal. We found clumsy movements of hands, problems with catching of small things, lack of thumb opposition, difficulties in visual-motor coordination, problems with precise manual skills. Laboratory tests, computer tomography (CT) of CNS and EEG were normal. In ophthalmologic examination lower acuity of vision: Vod=5/10, Vos=5/6 (pictures) was detected. Abnormal ossification of lunar bone core in radiology of both hands was found. In psychologic assessment intellectual ability was above average (IQ=126 in Terman–Merrill scale), high developed verbal skills, manual and graphomotoric ability lower than average to his age were detected. In the drawings tendency to rotation was observed.

SEP results are presented in *Tab. 2*. The latencies of cortical component P25 were prolonged, other were in normal range. Central conduction time (N13-N20 interlatency) was also normal. Latencies and amplitudes P100 component of VEP were in normal limits (left eye – 102 ms, 8.94 μV right eye – 104 ms, 8.64 μV). CERP Latencies: N1 – 87 ms, P2 – 150 ms, N2 – 221 ms and P3 (P300) – 301 ms were in normal range.

Discussion

Early studies in this field explored a variety of methods for identifying and describing children with DCD. Since there are no clear-cut criteria which define clumsiness and there is no "generally accepted" level of motor proficiency, it was found that the characteristics of children who were identified as having DCD depended upon the source of referral, the professional discipline of the researchers, and the types of assessments used [14]. Identification and assessment continues to be a major source of debate in the field and is confounded by the use, in different disciplines, of terminology or assessment methods which imply causation: DCD has no known cause. All children with DCD have some impairment of motor skill, in the absence of other physical and intellectual disorders; however, they are certainly not an homogeneous group. The only characteristic that has been demonstrated consistently in empirical studies is that children with DCD have slower movement time, regardless of the type of task or how it is taught or measured [15,16]. A recent trend in the research is to attempt to define subtypes of children within the DCD classification [17], in the hope that this may contribute to our understanding of why many treatment methods have been largely ineffectual.

After conducting a series of research studies, Laszlo and colleagues [18] have argued strongly for kinesthetic dysfunction and Hulme and colleagues [19] for visual perceptual dysfunction as the underlying problem in children with DCD. The kinesthetic findings have since been called into question [17] and there is evidence that most children with DCD do not have any visual acuity or other ophthalmologic problems [20]. The possibility of visual processing difficulties, however, remains an area of controversy that is continuing to be investigated [16]. At this time, evidence is mounting which suggests that children with DCD may rely more heavily on visual feedback for movement control [21] and that they may not use rehearsal strategies to retain visual information in memory [22].

Diagnosis of DCD should be confirmed by The Movement Assessment Battery for Children (MABC), a ball-catching test, a jumping test, a timed response task to a visual moving stimulus and The Beery-Buktenica Developmental Test of Visual Motor Integration, incorporating copying, visual discrimination and tracing tasks [23]. Children with DCD performed significantly worse than the control group on all measures. The visual discrimination task did not correlated significantly with any of the motor tasks and visual timing task correlated significantly with the ball-catching test in the DCD group [23].

Evoked potentials could be recorded to evaluate the integrity of the sensory pathways and to rule out the presence of any neurological lesions. In our patients we recorded prolonged latencies of cortical components of SEPs and prolonged central conduction time in patient No. 1 M.S. It could suggest possibility of disturbances in somatosensory pathways. We didn't find any studies in literature in this field. Only in patient M.S. VEP latencies were slightly prolonged. In patient K.B. VEP were normal. In Mon-Wiliams and colleagues study [24] pattern onset VEP were recorded in 14 children with DCD aged between 5 and 7 years, and age-matched control group using pattern onset, high contrast stimuli. Inattention and movement artifact meant that VEPs were more difficult to record within the DCD group resulting in smaller amplitudes of the waveform but no significant differences in the implicit times were observed between the DCD groups and control [24]. Normal CERP results, particularly P300 wave latency did not show any disturbances of cognitive function and processing information in DCD patients.

Results of research studies concerning causes and mechanisms of DCD are inconclusive. Further researches are required to determine the specific source of the neurological deficits in DCD but a problem with the integrity of the afferent visual and sensory pathways does not appear to be the main causal factor. Focused research will lead to greater understanding of the characteristics and needs of children with DCD.

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Neuroprotection possibilities in epileptic children

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Abstract

Purpose: The aim of this paper was to summarize of current knowledge about neuronal injuries during epileptogenesis process and possibilities of neuroprotection.

Results: Many of agents from a wide range of classes have been proposed to possess neuroprotective potential, but especially in experimental and preclinical conditions. Among the antiepileptic drugs topiramate (TPM) and levetiracetam (LEV) possess neuroprotective effects in experimental models of brain damage. Promising protection against cell loss display antioxidants and neurotrophins.

Conclusions: Important and difficult problem of neuroprotective therapy in childhood epilepsy require further experimental and clinical investigations.

Key words: neuroprotection, seizures, epilepsy, epileptogenesis.

Introduction

Epilepsy is one of the most common neurologic disorder, affecting approximately 0.8% of the population, especially it is frequent in children [1]. The immature brain differs from the adult brain in its susceptibility to seizures, seizures characteristics and responses to antiepileptic drugs [2]. Clinical experiences suggest the existence of relationship between brain maturation and susceptibility to seizures and epilepsy [3]. There are evidences of later-life epilepsy in cases of symptomatic seizures in the neonate period or complex and recurrent febrile seizures in childhood [4]. Patients with temporal lobe epilepsy (TLE) associated with mesial temporal sclerosis (MTS) have a reported increased incidence of previous neonatal or childhood febrile seizures [5,6]. There are hypotheses raise the possibility that childhood seizures that occur during a critical maturational period could alter brain development to increase the susceptibility to MTS and TLE [3].

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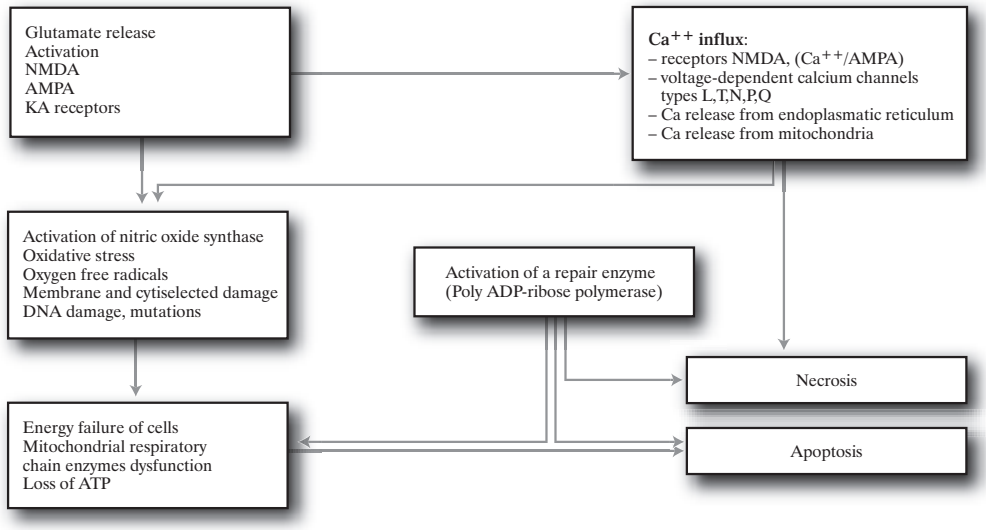
Seizure as way to epileptogenesis

In general, effective symptomatic treatment of seizures leads to stop seizures and reduce the morbidity and mortality associated with epilepsy. Gowers' concept that "seizures beget seizures" may have an element of truth because there are evidences that severe seizures are associated with neuronal injury and refractory epilepsy.

The clinical examples of potential epileptogenic events are: chronic epilepsy secondary to status epilepticus, temporal lobe partial seizures secondary to complex febrile seizures, and encephalopathic epilepsy secondary to neonatal hypoxia-ischaemia [7].

Especially status epilepticus can produce irreversible neuronal injury. Retrospective study Hesdorffer et al. found that epilepsy developed in 41% of individuals who had an episode of SE and in 13% of those with acute symptomatic seizure thereby suggesting a relationship between the prolonged seizure, SE and subsequent epileptogenesis [8]. The Barnard's study of children with status epilepticus but no history of seizures found that 36% developed epilepsy and 25% resistant epilepsy [9]. There are not evidence that prolonged seizures or complex febrile seizures progress to TLE, but in retrospective studies French et al. [10] reported that 78% of adults with TLE had febrile seizures in childhood and nearly 50% had prolonged febrile seizures. Recurrent seizures may cause structural and functional changes in the hippocampus, as demonstrated by findings that duration

Figure 1. **Mechanisms of neuronal injury**



of epilepsy correlated with hippocampal volume loss and progressive neuronal loss and dysfunction [11]. Seizure that develop during the first few hours of life in hypoxic-ischaemic neonates are clinical markers of later encephalopathy with high risk of epilepsy, cerebral palsy, cognitive impairment [12].

Neuronal loss is the major neurobiologic abnormality in epileptogenic and epileptic brain. It is important that neuronal loss occurs together with other alterations, including gliosis, axonal and dendritic plasticity, neurogenesis and molecular reorganisation of cell membranes and extracellular matrix [13].

Mechanisms of brain injury in epilepsy

At least two mechanisms are implicated in neuronal death: activation of the excitotoxic cascade (elevated calcium levels, activation of nitric oxide synthase and production of oxygen free radicals) and induction of apoptosis [14]. Mechanisms of neuronal damage and death are presented on *Fig. 1*. Once began the excitotoxic cascade can propagate. Release of intracellular glutamate from dying cells can raise the concentration of glutamate around neighbouring neuron to toxic concentration [15]. Thus, intervention in glutamate excitotoxic cascade is important possibility of disease modification.

The latent period of epileptogenesis and epilepsy development is the time that may be window of therapeutic intervention that might prevent the occurrence of unprovocated seizures. The interrupt of epileptogenesis will need to target critical processes and events during initial period of changes. Agents with multiple mechanisms of action may be capable to act at different points in the cascade of biochemical and structural changes. Intervention in epileptogenic cascade may provide: neuroprotection (preventing neuronal injury and death), neurostabilisation (restoring of neuronal function) and regeneration.

Neuroprotection

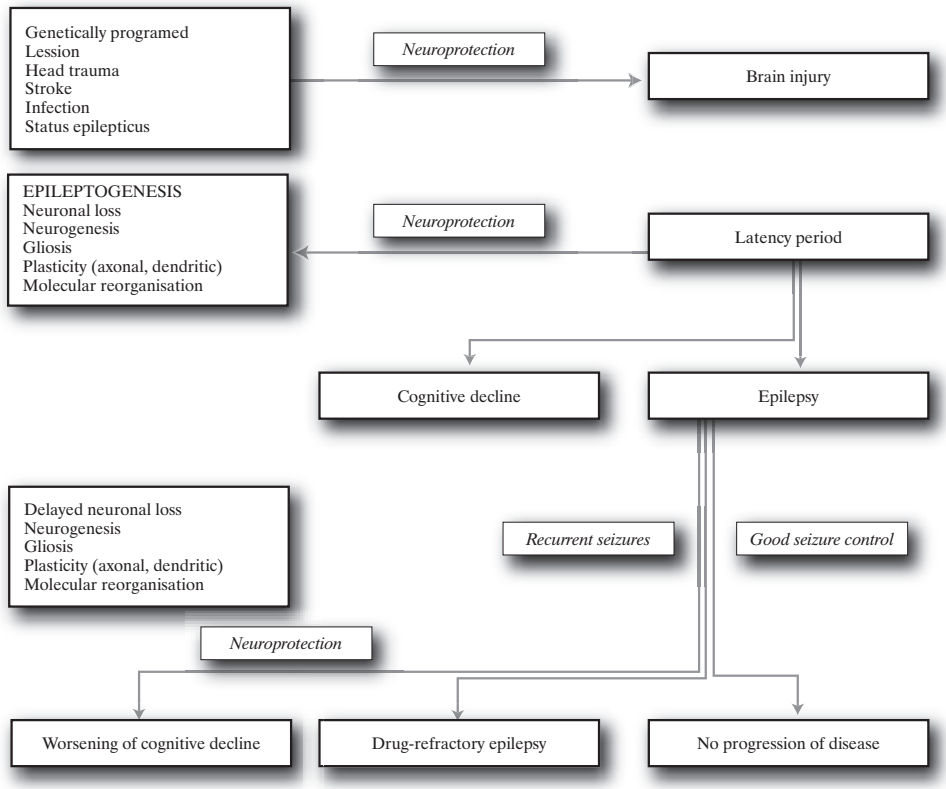
The term "neuroprotection" means the ability to prevent injury or loss of neurons. Pharmacological neuroprotection against the consequences of seizures can be considered as primary and secondary [16]. The primary neuroprotection is provided by antiepileptic drugs and compounds acting on voltage-sensitive Na^+ and Ca^{++} channels or on glutamate receptors. Secondary neuroprotection may be a result of acting on the cascade leading to necrosis or apoptosis [16]. Other possibilities may diminish the long-term morfological and functional consequences of seizures. According to Meldrum [16] neuroprotective treatment includes two areas: the prevention of cell death and the prevention of all the delayed functional consequences of seizures. The *Fig. 2* presents neuroprotection as a treatment target during epileptic process according to Pitkanen [17].

Pharmacological possibilities of neuroprotection

Many of agents from a wide range of classes have been proposed to possess neuroprotective potential, especially in experimental and preclinical conditions. Meldrum [16] presents two groups of agents with neuroprotective effects. To first group (primary neuroprotective agents) belong: Sodium channel inactivators, Voltage-sensitive Ca^{++} channel blockers, NMDA antagonists, AMPA antagonists, Group I glutamate metabotropic receptor antagonists, GABA A receptor potentiators.

Other ways of neuroprotection (secondary neuroprotection) include: blocking the cascade to necrosis, free radical scavengers: antioxidants, vitamin E, NO synthase inhibitors, COX-2 inhibitors, blocking the cascade to apoptosis: blocking

Figure 2. **Neuroprotection as a treatment target during epileptic process**



the inflammatory response, complex secondary effects: PAF antagonists, group II metabotropic agonists, neurotrophins and growth factors.

Clinical experience with traditional antiepileptic drugs suggest that these drugs prevent the symptomatic manifestation of seizures but they are less effective in influence on other important consequences of epilepsy such as neuronal loss, gliosis, and molecular reorganisation of cell membranes and extracellular matrix.

Date from experimental studies show that majority of antiepileptic drugs protect against fully kindled seizures in rats but kindling acquisition is not influenced by traditional sodium channel blocking agents and only those antiepileptic drugs with a GABA-ergic component to their mechanism of action [17]. Of these topiramate (TPM) and levetiracetam (LEV) have particular efficacy [18,19]. LEV protect against the development of kindled seizures for up to one week after discontinuation of the drug [19]. It seems that GABA-ergic mechanism of action is most important to neuroprotective effect of drugs.

Antiepileptic drugs as neuroprotectants in experimental studies

Many studies have been conducted to evaluate disease-modifying activity of antiepileptic drugs following initiating event.

In kindling models, repetitive subconvulsive stimulation creates a hyperexcitable state in which spontaneous seizures can develop without any stimulus. The fully kindled state has been viewed as a model of chronic epilepsy (complex partial seizures with secondary generalisation). Inhibition of this process with antiepileptic drugs has been interpreted as potential antiepileptogenic prophylactic effect. In animal kindling models valproate (VPA), phenobarbital (PB) and benzodiazepines (BZD) exert prophylactic effect – inhibit acquisition of the kindled state [20]. Of the new antiepileptic drugs both TPM and tiagabine (TGB) delayed seizure acquisition in kindling models and inhibited kindled seizures [18,21]. Kindling acquisition is inhibited by LEV and this effect persisted after acute treatment was discontinued [19]. However, a follow-up study found a loss of anticonvulsant activity during chronic treatment with LEV in kindled rats [22]. Unfortunately, the kindling model may not adequately replicate the human condition. In acquired epilepsies spontaneous seizures follow a latent period in which there is no repeated stimulation. Thus, effect in kindling model may not emulate clinical condition.

In experimental animal models of SE, recurrent spontaneous seizures often develop weeks to months after an episode of status epilepticus [23]. Subsequent studies indicate that alterations in GABA receptors precede or coincide with the development of epileptic seizures suggesting that these changes may be epileptogenic [24]. Treatment of status epilepticus with an intravenous BZD, phenytoin (PTH) or phenobarbital (PB) terminate SE without preventing development of late seizures. In experimental model of SE topiramate administered after

status epilepticus prevent neuronal loss in hippocampal regions CA1, CA3 and dentate hilus [25].

It is known that perinatal hypoxia induces acute seizures and subsequent seizure susceptibility with seizure-induced neuronal injury. Jensen et al. have been observed that an AMPA antagonist, but not a NMDA antagonist, was able to prevent acute and late epileptogenic effects of perinatal hypoxia in immature rats [26]. On this base it has been evaluated the antiepileptogenic effect of TPM – drug with the action at the AMPA receptor – in model of perinatal hypoxia. TPM administered to immature animals before global hypoxia suppressed hypoxia-induced acute seizures and reduced later-life susceptibility to seizures [27].

Neuroprotective effects of antioxidants

Cells contain natural defense system composed of enzymes that detoxify free radicals such as superoxide dismutase (SOD), catalase and peroxidase and, on the other hand, antioxidants such as vitamins C, E, glutathione, ferritin and uric acid. These system help the cell to maintain its homeostasis by neutralizing the oxidative effects of oxygen and its reactive metabolites [28]. Antioxidants therapies as neuroprotection involve either the administration of antioxidants which may react with free radicals or the strengthening of the endogenous antioxidant defences by enhancing the activity of superoxide dismutase, catalase and glutathione peroxidase [28,29]. Antioxidants can give protection against excitotoxic cell death in various in vitro systems, including selective neuronal loss induced by burst discharges which can be ameliorated by vitamin E [30]. Vitamin E and glutathione prevent the increase of lipid peroxides and neuronal death in hippocampus and reduce the seizure-induced neurodegeneration in cultured hippocampal cells CA3 [31,32].

Poor penetration of the blood-brain barrier is a problem with the antioxidants therapy. This may to be a reason for the relatively poor clinical response in most trials in neurological disorders [16,29]. A double blind trial with vitamin E as add-on therapy in children with epilepsy did, however, report a reduction in seizure frequency [33].

Neurotrophins as neuroprotective agents

Very interesting problem is the role of neurotrophins in long-term modification in neuronal excitability and synaptic function and their probably involvement in mechanisms of epileptogenesis and neuroprotection [34,35]. Brain-derived neurotrophic factor (BDNF) may be protecting the developing hippocampus against cell loss [36], nerve growth factor (NGF) and BDNF both promote the expression of antioxidative enzymes and thus can protect against cell death due to calcium overload mitochondria [16]. BDNF is more important in epileptogenesis and related processes but NGF and transforming growth factor β (TGF-β) in neuroprotection. In therapy delivery neurotrophins to the brain is problematic, but theoretically many indirect approaches are possible – factors modulating the release stimulating the synthesis of neurotrophins [37].

Our experience in neuroprotective therapy

In our studies, we have evaluated the mechanisms of neuronal damage in experimental models of seizures and possibilities of neuroprotection in experimental and clinical conditions [38]. We have been shown an increase of lipid peroxidation in almost all structures of the rat brain, particularly in cortex, hippocampus and cerebellum, after electroshock-induced seizures and beneficial effects of antioxidant – vitamin E on these processes [39,40]. Sobaniec [41] observed beneficial effect of combined therapy with VPA and vitamin E in epileptic children. We have been shown that oxidants-antioxidants balance in epileptic children is disturbed and antiepileptic therapy influence on these processes [42]. We have studied also the protective role of calcium antagonists in epilepsy including status epilepticus [43-45].

Conclusions

Neuroprotective therapy in epileptic children is very important but difficult problem. The antiepileptic drugs display their neuroprotective effects predominantly in experimental models or preclinical conditions. These data, however, promising, are unfulfilled. Experimental models are often not sufficiently representative of the clinical use and may sometimes offer false encourage. It is increasingly apparent that neuronal damage associated with epileptogenesis or other chronic neurological disorders involves multiple pathological processes which can interact and result in synergistic deleterious effects. To provide effective neuroprotection in epileptic children, the use of broad-spectrum therapy is necessary. Safety under chronic treatment conditions and with recognised penetration of blood-brain barrier drugs have to be used.

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New antiepileptic drugs – an overview

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Abstract

The last ten years of the 20th century is called in neuroscience "decade of the brain". This period has brought many new antiepileptic drugs (AEDs) to the practising physician. New AEDs include: vigabatrin, lamotrigine, topiramate, tiagabine, gabapentin, oxcarbazepine, levetiracetam and zonisamide (not registered in Poland). The development of these drugs was under the current epilepsy theory (balance-disturbances between inhibitory and excitatory neurotransmitters in the brain). Mechanism of action of the new AEDs is due to increase of the GABA-system activity and/or reaction with ion-channels events in neurons.

The aim of the study was an overview of the current literature on the new AEDs in the treatment of seizures and epileptic syndromes. Data from literature show that the new AEDs are better tolerated, have fewer drug interactions and seem to affect cognitive functions to a lesser degree compared to the conventional drugs. Most of them are recommended to an add-on therapy of partial seizures with/without second generalization, although there are more evidences on efficacy of new AEDs in monotherapy. The new AEDs seemed to be similar to the conventional drugs in efficacy, but superior in tolerability. New AEDs with more selective activity and lower toxicity have been significant improved the quality of life in the epileptic patients. Numerous chemical compounds with potential antiepileptic activity are in experimental and clinical development.

Key words: epilepsy, new antiepileptic drugs.

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The last ten years of 20th century is called in neuroscience "decade of the brain". This period has brought many advances to the treatment of neurological disabilities, including epilepsy. A number of new antiepileptic drugs (AEDs) have been licensed for the treatment of seizures. The new AEDs include: vigabatrin, lamotrigine, topiramate, tiagabine, gabapentin, oxcarbazepine, levetiracetam and zonisamide (not registered in Poland). The need of marketing new drugs was refractory epilepsy and severe side-effects of classical AEDs. Although most epileptics become seizure-free with traditional therapy, 30% of them will continue to have seizures despite the use of AEDs either alone or in combination [1]. The development of new AEDs have been based under the current epilepsy theory, where seizures resulting from alteration of the balance between neuronal excitation and inhibition [2]. Mechanisms of action of the currently marketed AEDs are more selective according to the classical AEDs and include modulation of voltage-dependent ion-channels, enhancement of inhibitory neurotransmission and attenuation of excitatory transmission in the brain [3]. Only levetiracetam has a novel mechanism of action (binding to the specific protein on the synaptic plasma membrane). The majority of the new AEDs after experimental and clinical studies was initially licensed to the treatment of refractory partial-onset seizures as add-on therapy to the classical AEDs. Few of the new AEDs have been evaluated in monotherapy, including severe epileptic syndromes as infantile spasms or Lennox-Gastaut syndrome (LGS). The results of yet experiences with new AEDs are very promising.

The aim of this work was a short overview of the current literature and results of our studies on the new AEDs in the treatment of seizures and epileptic syndroms.

1. Gabapentin

Gabapentin (GBP) was the second (after felbamate-not described in this paper) new antiepileptic agent approved to the market as adjunctive therapy for partial seizures (PS). Although GBP is structurally related to the predominant inhibitory neurotransmitter in the CNS – GABA, there are no significant

evidences that GBP directly interact with GABA-system and its precise mechanism of action is still unknown [4]. Possible mechanisms of action of GBP include sodium- and calcium-channels blockade. A numerous studies on GBP as adjunctive therapy of PS demonstrated significant reduction in seizure frequency from baseline [i.e. 5]. Results of trial comparing efficacy of GBP and carbamazepine (CBZ) in monotherapy in patients with refractory partial epilepsy suggesting equivalent efficacy of both drugs, but GBP had any severe adverse effects [6]. GBP is contraindicated in the treatment of primary generalized seizures (PGS) and can make worse progress and produce myoclonic jerks [7]. The ability of rapid introduction for the patient, wide margin of safety with good tolerability and no significant drug interaction are important advantages of GBP.

2. Vigabatrin

Vigabatrin (VGB) is an irreversible inhibitor of GABA-transaminase which exerts its antiepileptic effect by increasing the level of the neurotransmitter GABA. Except for use in infantile spasms, where it is recommended as monotherapy [8], VGB is used mainly as a second line antiepileptic drug in refractory PS. As an add-on agent, VGB is well-tolerated and can be of long-term benefit in a substantial proportion of patients with intractable partial epilepsy [9]. VGB has been compared with CBZ in few monotherapy trials. The largest study recruited 459 patients who were randomised to VGB or CBZ, and was of 52 weeks duration [10]. The results showed no significant difference between drugs for the primary end point time to treatment failure, or for the outcome time to 6 month remission. However, confidence intervals around these estimates failed to meet the authors' generous definition of equivalence. Patients taking VGB had significantly earlier first seizures post-randomization, and were significantly more likely to have VGB withdrawn due to lack of therapeutic effect, whereas CBZ was significantly more likely to be withdrawn because of side effects. Results of a prospective trial from our Department indicate that VGB seems to be safe and an effective antiepileptic drug as primary monotherapy for epilepsy in children with similar proportion of side effects as CBZ [11]. VGB similar as GBP is contraindicated in PGS (excluding infantile spasms – drug of 1st choice). This drug can trigger absence – and myoclonic seizures. The most severe toxic effects occurred during VGB-therapy are visual field abnormalities, which are reversible but need periodic control [12]. The commonest psychiatric manifestation of VGB-treatment, occurred even at 16% of patients, is depression [13].

3. Lamotrigine

Lamotrigine (LTG) is a broad-spectrum agent effective in partial, absence, myoclonic and tonic-clonic seizures [14]. LTG exhibits its antiepileptic effect by blockade of sodium-channels and to a lesser degree, calcium-channels [15]. A numerous clinical trials have shown LTG's efficacy as add-on therapy in PS and PGS (including LGS). In opposite to the majority of new AEDs, LTG can be used as monotherapy in PS with/without second generalization [16]. Rash is the main problem encountered by patients starting LTG and this lead to cessation of therapy [13]. There have been reports of LTG-associated Stevens-Johnson syndrome and toxic epidermal necrolysis. Severe rashes occur more often with rapid titration and in children [17]. The risk of skin rash is higher when LTG is coadministered with valproic acid, which inhibits the metabolism of LTG. LTG is one of the most effective new AEDs, which therapeutic spectrum is similar to valproate, but high risk of severe side-effects needs slow titration schedule, especially in concomitant therapy with valproate.

4. Tiagabine

Tiagabine (TGB) similar as VGB has selective mechanism of action on GABA-system in the CNS. TGB blocks uptake of GABA into neurons and glial cells [18]. TGB is narrow-spectrum agent effective only in PS with/without secondary generalization [19] and is licensed as add-on therapy in refractory partial epilepsy. Much clinical data show that TGB is efficacious and well tolerated [19,20]. Most often occurred side-effects of TGB are dizziness and drowsiness. There are rare reports on the non-convulsive epileptic status observed during the treatment with TGB [i.e. 21].

5. Topiramate

Topiramate (TPM) has generally been considered to be a highly effective new AED. TPM is licensed as adjunctive treatment in adults and children 2 years or older with PS, PGS, and seizures associated with LGS [16]. TPM has multiple mechanisms of action, including inhibition of sodium and calcium currents, blockade of the glutamate receptors and facilitation of GABA effects at the GABA-A receptor [3]. Retrospective studies comparing efficacy and tolerability of few new AEDs have showed that psychiatric side-effects (including depression and hallucinations with psychotic symptoms) were a significant problem with TPM leading to its withdrawal. Cognitive side-effects and weight loss were also reported by a high percentage of the patients taking TPM [13]. In the same study much as 40% of the patients had to withdraw of TPM due to side-effects. Other clinically relevant adverse effect of TPM is nephrolithiasis, with a reported incidence of 1.5% [22]. Despite of risk of above mentioned side-effects TPM offers high efficacy in the treatment of almost all seizures types.

6. Oxcarbazepine

Oxcarbazepine (OXC) is an analogue of carbamazepine. It is reduced to its active metabolite, 10-11-dihydro-10-hydroxycarbamazepine (HCBZ). The metabolic pathway of OXC does not include formation of an epoxide compound. The exact mechanism of action of OXC remains unknown, but it is believed to involve blockade of sodium-channels [16,23]. The clinical efficacy and tolerability of OXC have been demonstrated in numerous trials in adults and in children. Results of these trials have showed similar efficacy of OXC (as adjunctive therapy and as monotherapy) in the treatment of PS [16,23]. Compared with older AEDs (especially with CBZ), OXC appears to have lower incidence of side-effects [23]. The most common adverse effects are usually related to the CNS (dizziness, ataxia, nystagmus) and gastrointestinal system (nausea, vomiting). Other side-effect observed during OXC-therapy is hyponatremia. The decrease in sodium levels is related to the OXC dose. Most patients experiencing OXC-associated hyponatremia are asymptomatic [23], although there are reported severe case of hyponatremia result-

ing in coma [24]. OXC does not induce its own metabolism or hepatic enzymes and does not interact with other antiepileptic drugs [16].

7. Levetiracetam

Levetiracetam (LEV) is an analogue of piracetam, a widely used nootropic agent [25]. LEV has novel mechanism of action involving an interaction with a novel binding site on the synaptic plasma membrane recently discovered to be the Synaptic Vesicle protein 2A [26]. LEV is high-effective as add-on treatment of PS in adults [27] and in children [28]. There are much trials confirming its efficacy in generalized epilepsies [i.e. 29] and LGS [29,30]. Preliminary data suggest effectiveness of LEV as monotherapy in patients with new onset seizures [31]. Side-effects of LEV-therapy are mild and rarely necessitating discontinuation of the drug [32].

New targets in epilepsy treatment

The search for antiepileptic agents with more selective activity and lower toxicity continues to be an area of intensive investigation in neuroscience. There are many chemical compounds have been tested as antiepileptic agents. The drugs in most advanced development (including clinical studies) are: atipamezole, BIA-2-093, fluorofelbamate, NPS 1776, pregabalin, retigabine, safinamide, stiripentol, talampanel, ucb 34714 and valrocemide. Part of them is chemical derivative from marketed AEDs, the other representing new structural classes of compounds, for which the precise mechanism of action in epilepsy is still unknown. First clinical trials with these compounds are very promising [33].

The development of new AEDs has expanded therapy options and offered advantages to the patient. Although clinical trials show that new AEDs are not efficacious when compare to the classical drugs, their better tolerability and fewer drug interactions have significant improved the quality of life of epileptic patients. Comparative, long-term and open further trials should be done to assess long-term efficacy and comparative features of the new AEDs.

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Youth′s knowledge and attitude to epilepsy

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Abstract

Purpose: The aim of this research is to assess youth's knowledge and attitude towards their epileptic peers.

Material and methods: The present study concerned 181 students of two secondary schools in Poznań, including 107 girls and 74 boys. The tool used was a self-made questionnaire. The criterion of including a questionnaire into data was the answer to the following question: "Have you heard about epilepsy?"

Results: The questionnaire has shown that 46% of secondary school students had already known a person with epilepsy. 91% of students knew that epilepsy was not a contagious disease, but 12% of pupils thought that epilepsy was a mental illness. Almost 23% of respondents claimed they knew what could cause epilepsy. Only 2% of the students knew how to provide first aid during an epileptic fit. 92% of the respondents accepted a person with epilepsy among their friends.

Conclusions: The level of the knowledge about epilepsy among pupils is insufficient. The youth do not know the causes of epilepsy, provocative factors of convulsions, and symptoms and the rules of giving first aid during an epileptic fit. The main source of information about the disease were television programs. The majority of the school – graduates expressed willingness to make friends with epileptic people and acceptance of the ill.

Key words: epilepsy, knowledge, attitude.

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Introduction

Epilepsy is one of the most frequent neurological conditions of adolescence. Usually, it is a chronic disease and it has a negative influence on the social situation of the person. Many of the researches so far have shown lack of tolerance, or even a stigma attached to epileptic people [1-7].

Thus, it seems that social attitude based on tolerance and frankness is a necessary condition for the right social functioning of the ill. In the case of epilepsy, the knowledge about the illness also plays a crucial role. The correct way of providing first aid during an epileptic fit may greatly influence the ill person's health and life [9].

The research done in Poland so far have shown insufficient knowledge of the society. There is a belief that while helping in an epileptic fit one should put an object into the patient's mouth and the clinical picture is associated mostly with generalized fits [8,9].

Nowadays the youth at schools have unusual access to information (the internet) and the media often raise the subject of tolerance. Therefore, it is worth finding out what attitude towards epileptic people have young people and if they have sufficient knowledge about this illness.

The objective of this study was to learn the secondary school students' knowledge and attitudes towards the ill. Moreover, the research was to show if the following factors influence the knowledge and attitudes: age, sex, previous acquaintance with an epileptic person.

Material and methods

The study was carried out from September until December 2004. It concerned 181 secondary school students, including 107 girls and 74 boys. Among the surveyed, 110 people attended XVIII Secondary School and 71 were from Geodesy-Oriented Secondary School in Poznań. The questionnaire used in the research was based on a review of some academic literature

Figure 1. **The most frequently mentioned causes of epilepsy**

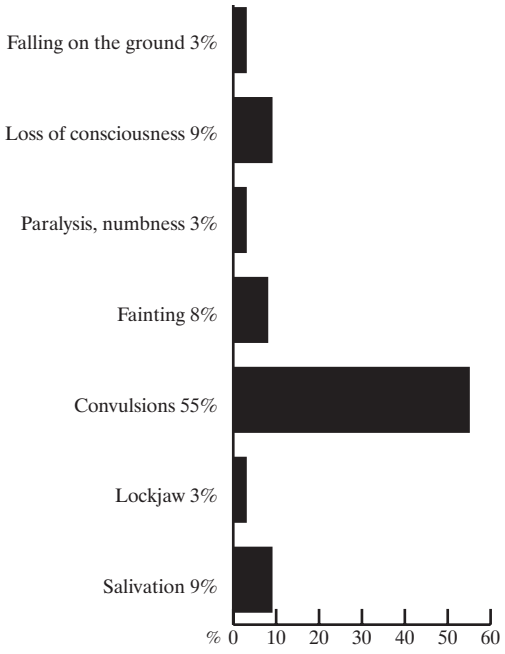
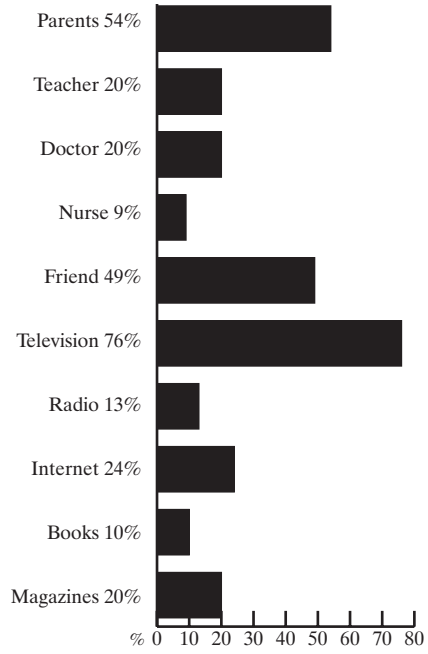


Figure 2. **The sources of students' knowledge about epilepsy**



[5-9], accompanied by a register with the questions concerning the socio-demographic situation of the students. The statistical analysis accounted 181 of questionnaires. The inclusion criterion was a positive answer to the following question: "Have you ever heard about the disease of epilepsy? To examine the relation between the variables the Chi-square test was used, with the significance level $p \leq 0.05$.

Results

The most numerous group among the surveyed were students at the third grade (46%), the second grade (37%), and the first grade (17%). The questionnaire has shown that 46% of the secondary students said they knew an epileptic person. 91% of the youth know that epilepsy is not an infectious disease but 12% consider it as a mental illness.

The majority of the respondents did not know the cause of epilepsy and factors evoking epileptic fits. Almost 23% of students mentioned: increased emotional pressure (7%), malfunctioning of the nervous central system (5%), head injury (4%), genetic factors (3%), and hypoxia (2%). The students, who declared the knowledge about the factors evoking the epileptic seizures reported: nervousness (17%), overtiredness (3%), alcohol (2%), anxiety, fear (2%), hypoxia (2%), and blinking light (1%). The respondents, who thought they knew the symptoms of epileptic fits, named: convulsions (55%), loss of consciousness (9%), salivation (9%), fainting (8%), lockjaw (3%), paralysis (3%), and falling on the ground (3%) (*Fig. 1*). The question concerning first aid during an epileptic fit had four answers. Students were supposed to choose the correct one. Only 4 of them pointed out this answer (*Tab. 1*).

Table 1. **Answers to the question: „Do you know how to behave when a person is having an epileptic fit?"**

Answer	N	%
Put the person on one side and observe. If the epileptic fit continues, call an ambulance.	4	2.2
Put something between the teeth so that the person does not bite their tongue.	129	71.3
Do not touch the person during the epileptic fit, call an ambulance immediately.	17	9.4
Hold the hands and legs so that the body is not injured.	31	17.1
Total	181	100.0

The youth's opinions about relations between epileptic children and their healthy peers were verified to analyze the area of social life. 81% of the students claimed that ill children could play with healthy ones, attend a state school (71%) and go away for summer camps (54%).

Almost all the surveyed (92%) would accept an epileptic person among their acquaintances, however, 84% could become friends with them.

Another vital point was to learn the sources of students' knowledge about epilepsy. The students listed TV programs most frequently (76%) and knowledge gained from their parents (54%) (*Fig. 2*). The answers do not equal 100% because the respondents could choose more than one answer.

In answer to the question how to increase students' knowledge about epilepsy the majority of the youth (53%) pointed education in schools.

The Chi-square test showed many relations between sex of some of the answers. It was girls, who more often confirmed the knowledge about epilepsy ($p=0.03740$), acceptance of an ill person ($p=0.00070$). They also knew that epilepsy is not a contagious disease ($p=0.03583$). Neither of the girls, however, knew the right behaviour during an epileptic fit. A relation between confirmed knowledge about the symptoms of epilepsy ($p=0.00102$) and the age of the surveyed was also noted.

The students who had already known an epileptic person more often knew the causes of epilepsy ($p=0.00348$), factors bringing about fits ($p=0.01819$) and they knew that epilepsy is not a contagious disease ($p=0.00689$).

The respondents who had not known an epileptic person before more frequently answered "I don't know" to questions concerning acceptance of an ill person ($p=0.00147$).

Discussion

Vast majority (98%) of the survey participants had heard about this disease. In her research evaluating students' knowledge about epilepsy, Klimek B indicated that 90% of the respondents know what epilepsy is [8]. In Majkowski's studies, 95% of the Polish country population confirmed the knowledge about the disease [7].

In this survey, the majority of students did not know the causes of epilepsy or factors provoking the fits.

More than a half of the surveyed mentioned convulsions as the main symptom of epilepsy. The popularity of this belief was confirmed by Siemiński M in his research carried out on a group of recent secondary school graduates, in which he said that 96% associate epilepsy with convulsions and taut muscles [9].

Epilepsy is often perceived as a mental disease. In the above research, 50.5% of the students linked epilepsy with mental disorder [9], in the self-made survey, 11.6% did.

Very poor knowledge about first aid during epileptic fit has been noticed. This lack of knowledge is also visible in other authors' researches. Karkirawatana's study about teachers' awareness of the problem of epilepsy, 73% of the respondents said they would find putting objects into the epileptic person's mouth during a fit the right procedure [3]. In Klimek's study, 81% of the questioned chose this behaviour as the best [8]. In the self-done research, only 4 boys pointed the correct way of behaviour when giving first aid. Three of them had not known an epileptic person before.

The majority of students pledged acceptance of epileptic people and expressed readiness to become friends with them. Similar results were achieved by Klimek [8].

In Siemiński's studies, 95% of the questioned were of the opinion that epileptic children should attend a state school. Karkirawatana's study brought corresponding results. Only 15% of the surveyed in his study said that epileptic children should attend special schools [3]. There is a direct correlation between the self-done research and the studies above.

The most frequently listed source of the knowledge about epilepsy in Siemiński's studies was television [9]. 53% of then students found the popularization of the knowledge about epilepsy in schools really essential.

Conclusions

1. Knowledge about epilepsy among students is insufficient. Youth do not have information concerning first aid during an epileptic fit and factors causing ill people's fits.
2. The main source of information about the disease pointed by students was television.
3. The majority of the surveyed recent secondary school – graduates express willingness to make friends with epileptic people and accept the ill.
4. There is the necessity to educate youth about epilepsy within school curricula.

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Community nursing care of the elderly during transformation of the primary health care system

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Abstract

Purpose: Worsening of health as well as raising disability in course of aging lead to the increase in the needs for medical and nursing services. The on-going reforms of the primary health care system has brought the organizational transformation in community nursing care into the forms of non-public community nursing units. The aim of the study was to describe the characteristics of community nursing care provided to older people with regard to the differences between a traditional model of the public (SPZOZ) and new model of non-public units (NZOZ).

Material and methods: The study was carried out in all 113-community nurses employed in Białystok, regardless of the form of employment. The questionnaire was answered by 101 nurses, from which one was excluded due to double employment in public (SPZOZ) and non-public (NZOZ) settings. From among of the remaining 100, 76 were employed in SPZOZ and 24 in NZOZ. As the research tool was used the questionnaire.

Results: The data obtained show the predominance of the therapeutic (95%) and diagnostic (78%) services which were more frequently provided by nurses employed in public sector (SPZOZ). Assessment of social situation as well as a caring process, education was rarely provided in both groups of nurses.

Conclusions: Mostly instrumental and therapeutic activities predominated in the community nursing. Generally, any significant differences between two settings of nursing care there were not found. The traditional model of community nursing care enables the realization the full professional competence of nurse in the primary health care system.

Key words: elderly people, community nursing care.

Introduction

The deterioration in health and ability, which comes with age, causes an increasing need for medical and nursing aid. In recent years, reforms introducing the institution of family doctors into the Polish health care system forced organizational changes in community nursing. The traditional nursing care model based on assigning public health care units (Samodzielny Publiczny Zespół Opieki Zdrowotnej – SPZOZ) to particular districts is replaced by various non-public health care units (Niepubliczny Zespół Opieki Zdrowotnej – NZOZ), which provide nursing care for patients of a particular GP or independently [1]. In the new health care system the assumption is that a community nurse takes part in medical treatment not only by doing assignments for the GP, but also takes her own professional actions, therefore realising a complete and continuous nursing process for a family and its members in their home environment, be they healthy, sick, terminally ill, disabled or bedridden [2].

The aim of the study was to get to know the character of community nursing care provided for elderly including the differences between traditional (SPZOZ) and new (NZOZ) model.

Material and methods

The research was conducted in Białystok among all 113 community nurses, regardless of the form of employment. 101 nurses responded to the questionnaire, one of which was

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Table 1. **The demographic characteristics of community nurses in Białystok and their professional activities for the elderly (in %)**

	SPZOZ (N=76)	NZOZ (N=24)	Total (N=100)
	(%)	(%)	(%)
The age structure of community nurses [p<0,01]*			
Below 30 (n=4)	-	16.7	4.0
31-40 years old (n=16)	15.8	16.7	16.0
Over 41 (n=80)	x84.2	66.6	80.0
Total	100.0	100.0	100.0
Average work experience in community nursing (in years)			
	15.2 +_6.7	10.1+_7.1	
Categories of nursing services performed for elderly within the last two weeks			
Medical treatment [p=0.003]	98.7	83.3	95.0
Diagnostic services [p NZ]	77.6	79.2	78.0
Nursing care services [p NZ]	52.6	54.2	53.0
Assessment of needs [p NZ]	46.1	29.2	42.0

* the p value applies to the comparison between forms of employment (SPZOZ and NZOZ)

excluded because she was employed in both kinds of health care units. 76 of the nurses worked in public units and 24 in non-public units. The response rate was 89.4% and is highly representative of Białystok. The research was conducted through an anonymous questionnaire. A quantitative-percentage distribution of qualitative data was used in statistical analysis. To evaluate the difference between groups a Chi^2 Pearson independence test or accurate Fischer test were used. The significant level was assumed to be $p<0.05$. The statistical analysis was done with the Statistica 6.0 software.

Results

1. The demographic characteristics of community nurses in Białystok

The research included a 100 of all 113 community nurses working in Białystok, who answered the anonymous questionnaire. The comparison showed that 76% of the respondents were employed in the public health care units (SPZOZ), while the remaining 24% claimed to work in private institutions (NZOZ).

Nurses over 40 years old formed a majority of respondents as large as 80%. Only four nurses were below 30 (*Tab. 1*). The age structure comparison depending on form of employment shows statistically significant differences ($p<0.01$) – younger nurses tend to work in non-public units more often. Work experience analysis shows that nurses who have worked in community nursing for longer (i.e. are more experienced) form the largest group. 67% of the respondents had over 10 years experience, while the remaining 33% had less. The average work experience in public institutions was 15.2 years and in non-public 10.1 years.

2. The range and character of community nursing among elderly

It was interesting to compare the character of community nursing in the traditional and new model. To achieve this, the range of services performed for the elderly within the last two weeks was analised. It showed that the majority (95%) of nurces focused on medical treatment of the elderly (*Tab. 1*). Much more often were these services performed among elderly in public health centres (SPZOZ). These outcomes can be explained by a far larger number of patients per one nurse in public units.

Over three quarters (78%) of the nurses' tasks in caring over an elderly were diagnostic services. In this category there do not seem to be any difference between the two kinds of health centres. Caring tasks formed a little more than a half (53%) of all the tasks performed by the nurse. No statistically significant difference was noticed here. In nursing the ability to distinguish and realise independent tasks, while sustaining and improving cooperation with a physician is strongly stressed. Assessment the needs, which are the basis of a nurse's intervention, made up a definite minority among the tasks performed by nurses – a 42%.

Another interesting question was about the character of home visits. A detailed analysis was conducted on the basis of the current range of competences of a community/family nurse. Every nurse was asked to indicate the services she had performed most often in house of an elderly within the last 12 months. There were three categories to choose from – education and promotion of health, nursing and care, and taking part in medical treatment and diagnostic tasks.

The modern approach in nursing stresses the complimentarity of caring over both the healthy and sick. A great value is put to promoting health, health education and advising by nurses. Research has shown that almost all community nurses educated their elderly patients at home within the last 12 months. The subject of this education was usually diet and physical activity. A little less attention was given to the problems of health hazards and lifestyle during sickness.

As far as diagnostic services are concerned the most frequent activities of nurses were: measuring the pressure and collecting blood samples (*Tab. 2*). Significant differences connected with the form of employment were observed – these services were declared almost twice more often by nurses from public health care units. Over three quarters of diagnostic services performed in the homes of the elderly included monitor-

Table 2. Diagnostic and medical services performed by nurses within the last 12 months

Categories of home nursing services offered to the elderly	SPZOZ N=76	NZOZ N=(24)	Together N=100	P value
	(%)	(%)	(%)	(%)
Diagnostic services				
1. Measuring the pressure, pulse rate	98.7	95.8	98.0	NZ
2. Taking blood samples	98.7	58.3	89.0	p=0.00000
3. Monitoring glucose level in blood	84.2	83.3	84.0	NZ
4. Taking urine samples for analysis	90.8	45.8	80.0	p=0.00001
5. Hearing monitoring	5.3	29.2	11.0	P<0.01
6. Weight monitoring	6.6	20.8	10.0	NZ
7. Sight monitoring	4.0	20.8	8.0	P=0.01
Medical services				
1. Injections	100.0	83.3	96.0	p=0.001
2. Bladder catheterizing	79.0	25.0	66.0	p=0.00000
3. Intravenous drip infusions	67.1	37.5	60.0	p=0.001
4. Cupping-glasses and ointments applying	32.9	-	25.0	p=0.001

Table 3. **Care services within the last 12 months**

Categories of home nursing services offered to the elderly Care and protective activities	SPZOZ N=76	NZOZ N=24	Together N=100	P value
	(%)	(%)	(%)	
1. Comforting and psychological support	98.7	95.8	98.0	NZ
2. Help in contacting GPs	96.1	91.7	95.0	NZ
3. Instructing on self-care	92.1	83.3	90.0	NZ
4. Treatment of bedsores	82.9	54.2	76.0	p<0.01
5. Help in receiving a prescription	67.1	62.5	66.0	NZ
6. Dressing difficult to heel wounds such as ulceration of shanks	65.8	58.3	64.0	NZ
7. Patting	69.7	41.7	63.0	p<0.01
8. Helping bedridden patients to change their body position	67.1	41.7	61.0	p=0.01
9. Embrocating	65.8	37.5	59.0	p<0.05
10. Help in dosing and taking oral medicines	56.6	50.0	55.0	NZ
11. Whole body toilet	35.5	37.5	36.0	NZ
12. Toilet in the case of problems with keeping up urine	27.6	25.0	27.0	NZ
13. Feeding and drinking	21.1	25.0	22.0	NZ
14. Toilet in the case of problems with keeping up stool	14.5	33.3	19.0	NZ

ing glucose level in blood and taking urine samples for analysis. These two were most frequently offered to patients of public health care units. Community nurses, while taking care of their elderly patients, most frequently monitored their hearing, sight and weight. These tasks were more frequently undertaken by nurses from non-public units. Statistically significant differences were observed.

Medical services were the next examined category. Injections, as the most frequent service, were placed in the first position (*Tab. 2*). Nurses from public health care units offered these services slightly more frequently than nurses from non-public ones. Bladder catheterizing was found in the second position. It was done significantly more frequently among patients being under the care of public health care units. Intravenous drip infusions covered a lesser percentage of medical services. They were done twice more often by nurses from public health care units than by those from non-public ones. Every fourth nurse applied cupping-glasses and ointments.

Independent nursing and care services were the next category examined in the research (*Tab. 3*). Most frequently, nurses comforted their elderly patients and provided them with psychological support. They also helped in contacting GP and instructed people on self-care. Over three quarters of nurses (more frequently from public health care units) said that they treated bedsores. Over half of the community nurses offered such services as help in receiving a prescription, treating poorly healing wounds such as for example ulceration of shanks. Nurses also helped bedridden patients change their body position and made other improvements. The latter activities were done significantly more frequently by nurses from public health care units. Equally frequently, nurses embrocated diseased body parts, did some patting helped to dose and take medica-

ments, and to contact social workers. The latter activities were performed significantly more frequently by nurses from public health care units. Community nurses devoted the least care to problems connected with keeping urine and stool. Only every fourth community nurse declared help with these problems. As many nurses took part in feeding and drinking elderly people at home (*Tab. 3*).

Discussion

The study was conducted in the period of structural employment changes in primary health care aimed at making health care units independent and it is probable that the results are influenced by this fact. The reforms, which have been in progress for a few years now, based on the new Family Doctor institution, forced certain organizational and competence changes in community nursing [1-3]. The traditional nursing care model based on assigning public health care units (Samodzielny Publiczny Zespół Opieki Zdrowotnej – SPZOZ) to particular districts is supplemented by various non-public health care units (Niepubliczny Zespół Opieki Zdrowotnej – NZOZ), which provide nursing care for patients of a particular GP or independently. Even though health care units are no longer assigned to particular districts most elderly still use the services of "their GP", which is the one situated nearest to where they live, usually where the old district unit used to be. This is only natural, an elderly patient, often with limited mobility, should have his GP and community nurse close by. Still, does this necessarily mean that their services are accessible?

Earlier community research [4] has shown a great disproportion between the relatively small numbers of employed nurses as compared to the number of elderly patients in "demographically old" city districts in comparison to "demographically young" districts. Public units served the "oldest" downtown districts, where there was one nurse for every 300 people aged 75 or more. Non-public units organized mostly in new settlements of the city had one nurse for every 130 people from this age group. This disproportion, caused by neglecting demographic factors in planning employment in health care units, causes community nurses to be overburdened and decreases their ability to perform their professional duties and job satisfaction. In this situation there is a risk of the nurses being unable to perform their caring tasks towards disabled elderly. This made it interesting to know the differences in the functioning of community nursing in the two types of health care units.

Although almost all nurses (95%) declared taking part in treatment of elderly, nurses employed in the traditional public units have indicated this type of services significantly more often. In the next most common group of services – diagnostics (78%) – there are no relevant differences. Typical nursing care-services made up a little over a half (53%) of all services. Again, no relevant difference between the two types of health care units appeared. Recognising and assessment of needs, which are the basis for a nurse's intervention, formed the deffinately smallest group – only 42%. This last category of tasks was indicated almost twice more often by nurses in non-public units.

The results concerning nursing services towards elderly show a wrong structure. In both organizational forms instrumental activities, ordered by the doctor, prevail, while independent actions are almost twice less common.

An analysis of the categories of medical services in the patients' homes showed significant differences in various forms of health care units. Nurses in public units declared performing these services significantly more often. It was similar with diagnostic services such as collecting blood or urine for analysis. These were also performed almost twice more often by nurses working in public units. There are similar results concerning typical nursing services, like treating bedsores, instructing the family on how to care over the patient at home, or help in contacting a social aid worker. Nurses in public units performed these tasks significantly more often. This can be explained by a definitely bigger work-load which is put on nurses in public units, due to larger numbers of patients in their care.

In relation to educational or prophylactic activities no significant differences were noticed between the two forms of employment.

The results of the research prove that community nursing during the reform of the health care system is still traditional in its form – dominated by instrumental services ordered by doctors, which do not allow for the community/family nurses' competences to be fully realised. There is a visible tendency towards low independence and creativity among nurses in performing services such as health education, nursing and care, which lie within a nurse's professional competence. The stereotypes of community nursing are partly caused by administrative and organizational deficiencies in health care units. This is confirmed by the results of earlier research, which indicate, that the efficiency of community nursing varies greatly. So far the policy of employment did not include demographic aspects, which automatically means an unequal access to nursing services in different city districts with different demographic ages. Ignoring this leads to overburdening and inability of nurses in demographically "old" areas, as well as to degeneration of services and frustration among patients and nurses [5].

In the period before the reform of health care it was indicated that community nurses did not utilize their time properly, that they performed too many tasks ordered by doctors and took too little a part in assessing the needs of their patients [6,7]. The results of research concerning primary health care over the elderly in the region of Katowice show, that the role of a community nurse was reduced to making injections, measuring blood pressure and sugar level, changing bandages and collecting blood samples for analysis. The research stressed that the psychoterapeutic role of the community nurse was important, while help in using prescriptions and keeping personal hygiene was rare. Nurses complained about difficulties in cooperation with social and non-governmental organizations, institutions and families [8,9,10]. Regardless of the presuppositions community nursing is far from the expected model of functioning of health care units. Little participation of nurses in active care over an elderly still remains one of the problems of basic health care and the role of community nurses has only theoretically changed. Getting to realise that these problems exist creates a chance of starting positive changes in basic care over elderly and requires further study.

Conclusions

Despite of the reorganization of the community nursing in the primary health system, the new forms of community nursing care do not show modern standards. There are still dominated by instrumental tasks, which make it difficult to utilize the full spectrum of professional competences of community nurses in health care units.

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The education of patients with rheumatoid arthritis – the knowledge and expectation of patients – the opinions of rheumatology nurses

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Abstract

Rheumatoid arthritis (RA) is a chronic, progressive, immunologically dependent, systemic diseases of connective tissue, leading to disability, cripplehood or even premature death. Helping to improve the quality of life of RA patients involves teaching them how to cope with disease-related problems of everyday life, with stress and with suffering.

The aim of the presented work is to determine the following: the patients' level of knowledge about rheumatoid arthritis; their educational needs; the impact of the level of knowledge on the patients' pro-health behaviours; the knowledge of nurses and their ability to recognize patients' problems; the nurse's tasks in preparing an RA patient for self-care.

The subject group consisted of patients with RA diagnosed according to The American Rheumatism Association criteria and nurses from rheumatology clinics and wards. The research method used was a survey questionnaire, which had been constructed for the purpose of the research.

The research results indicate a great need of patients, especially those with early rheumatoid arthritis, for education, support and help in adaptation. At the same time, the nurses, even though they do not fully fulfil their educational role, declare a willingness to participate in organized forms of health education.

Key words: knowledge about the disease, self-care, nurse's educational tasks.

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Introduction

Education means the activities connected with the process of teaching, the aim of which is to raise the competence of individuals/families in dealing with diseases and health hazards [1].

The role of patient educators should be fulfilled by different kinds of specialists, including nurses, according to their competence in respect of achieving educational goals and realizing planned tasks. By taking care of a patient, his/her family and environment, a nurse influences, through her educational behaviours, the attitudes, health beliefs, motivations and systems of values of the patient/family, and educates them by giving knowledge and developing skills [2].

It is believed that patient education is one of the ways to limit disablement in rheumatological diseases and to improve the patients' quality of life. It follows The Therapeutic-Diagnostic Standards of the Polish Rheumatology Association, which state that in rheumatic diseases patient education is recommended as the most important part of the therapeutic procedure [3].

Chronic rheumatoid arthritis (RA) is a systemic disease of connective tissue, characterised by the inflammation of joints, extra-articular changes and systemic complications. The long and progressive course of the disease leads to disablement, cripplehood or even premature death [3]. Numerous studies have shown that in case of 60-90% of patients irreversible joint changes develop during the first years of RA [4,5].

The objective of the presented work is to determine the following: the patient's knowledge about rheumatoid arthritis, their educational needs; the impact of the level of knowledge on pro-health behaviours; the level and scope of the nurses' knowledge about RA and their ability to recognize patients' problems; the nurse's tasks in preparing an RA patient for self-care and self-nursing.

Table 1. **Health problems reported by patients and disease duration**

Health problems	Disease duration					
	Group I		Group II		Group III	
	0-5 years n=28		6-10 years n=29		≥11 years n=43	
pain	28	100%	29	100%	41	95.4%
joint stiffness	22	78.6%	27	93.1%	33	76.7%
lack of physical fitness	18	64.3%	23	79.3%	36	83.7%
weakness, discomfort	15	53.6%	13	44.8%	25	58.1%
low spirits	11	39.3%	12	41.4%	28	65.1%
poor drug tolerance	8	28.6%	6	20.7%	17	39.5%
		*		*		*

* Variable of multiple answers – the values do not add up to 100%

Table 2. **The location of the pain experienced by patients and disease duration**

Experienced pain	Disease duration					
	Group I		Group II		Group III	
	0-5 years n=28		6-10 years n=29		≥11 years n=43	
single joints	5	17.9%	16	55.2%	8	18.6%
statistical significance	p=0.038 Group I vs Group II					
			p=0.022 Group II vs Group III			
the majority of joints	23	82.1%	13	44.8%	35	81.4%

Table 3. **Nurses' evaluation of patient education usefulness in therapy and the overall practice**

Significance of education	Disease duration							
	Group I		Group II		Group III		Group IV	
	up to 5 years n=12		up to 10 years n=20		up to 20 years n=77		≥21 yers n=66	
important element of therapy	9	75.0%	15	75.0%	53	68.8%	42	63.6%
one of many elements	3	25.0%	5	25.0%	24	31.2%	24	36.4%

Materials and methods

The subject group consisted of 100 inpatients and outpatients with RA diagnosed according to the ARA criteria. The material was collected individually by means of personal meetings with patients. The research also covered 175 nurses from 10 rheumatology clinics and wards in Poland.

The method used in the research was a survey questionnaire, which had been constructed for patients and nurses for the purpose of the research.

Results

Patients group

Demographic data The patients studied (n=100) were divided into 3 groups according to the disease duration: Group I (0-5 years), Group II (6-10 years), Group III (≥11 years). The patients aged 41-50 were in majority in the group with up to 10 years of disease duration whereas the patients aged over 50 have usually suffered from RA ≥11 years (70%). 41% of the studied patients had secondary education. The majority of the respondents (66%) lived in a city/town. Patients living in a village are mainly those with disease duration ≥11 years.

As far as the professional activity criterion is concerned, the pensioners constituted the biggest group (42%), especially in the group with disease duration ≥11 years (53.5%) (p=0.036). 27% of patients from this group were also retired.

The health problems reported by patients most often concerned: pain, morning joint stiffness, a progressive lack of physical fitness and weakness. Patients from Group III more often mentioned bouts of low spirits and depression. The longer the disease duration the more intensive were the reported ailments (*Tab. 1*).

Altogether 71% of patients in early and later stages of disease duration complained about pain in the majority of joints. The patients with disease duration of 6-10 years reported pain in single joints statistically more often than the patients with disease duration of 0-5 years (p=0.038) and ≥11 years (*Tab. 2*).

Half of the studied patients evaluated their health as bad. It particularly refers to the patients with early RA and with ≥11 years of disease duration.

Patients' health behaviours A considerable percentage of the studied patients (45%) took exercise every day, regardless of RA duration. The Group III patients exercised more often than the remaining surveyed. The majority of the surveyed (77%) went for a walk every day.

The surveyed believed that a light diet with low animal fat is recommended in arthropathy. More than 70% of the studied patients, particularly those from Group I, did not follow the dietetic recommendations for arthropathy.

The majority of patients (85%) were regularly in touch with their therapist and took anti-inflammatory drugs. More than half of them (52%) did not have any therapeutic rehabilitation, or used to do it occasionally years ago.

The knowledge about the disease The patients believed that in RA the most important recommendations to limit the disease progress are: to take regular exercise, to protect the joints by not straining them and avoiding exposure to cold, to take regular medication (*Fig. 1*).

It appeared that the Group I patients to a greater extent declared a lack of knowledge about the disease in comparison with other patients (p=0.005). On the other hand, as many as 77% declared a willingness to broaden their knowledge about RA. The Group III patients were the least interested in education (18.6%) (*Tab. 3*).

Participation in RA educational activities The vast majority of patients (87%) did not take part in any organized forms of health education concerning RA. The participation in educa-

Figure 1. **The recommended ways of limiting the disease progress quoted by patients**

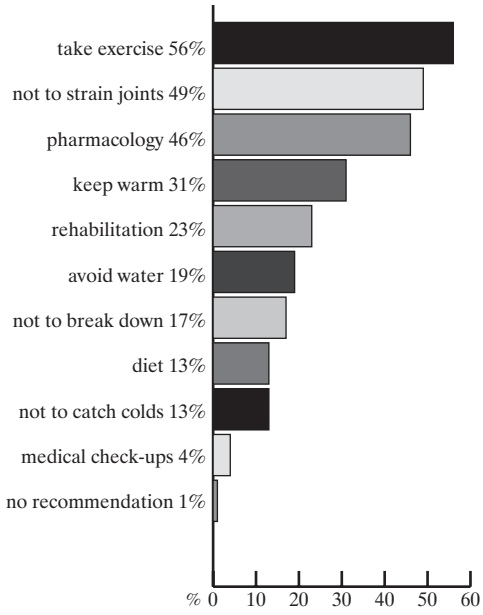
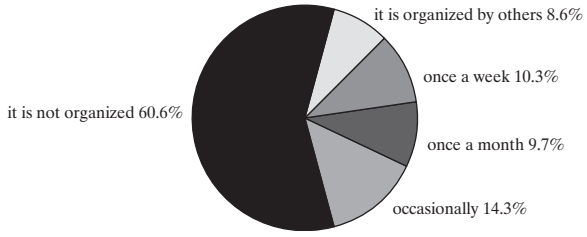


Figure 2. **The frequency of organized patient education in the workplace of the surveyed nurses**



tion was several times bigger in case of patients who had been ill for a long time (23.3%) than those from Group I (3.6%) and Group II (6.9%) (p=0.035). The patients were particularly interested in the following subjects: the clinical course of RA, rehabilitation rules, psychological problems of chronic patients. They suggested different forms of active education, in particular a discussion and a chat.

The surveyed declared satisfaction from their interpersonal contacts with the nurse. They believed that she can support a patient in difficult situations.

Nurse group

Education The studied nurses (n=175) were divided into 4 groups according to how long they had worked in the profession: 0-5 years (6.9%), 6-10 (11.0%), 11-20 (44.0%), ≥21 years (37.7%). The nurses with up to 20 years' experience in a rheumatology clinic/ward were the biggest group. The majority of the surveyed had secondary education (84%) (p=0.004) and the nurses with higher education and specialization were in minority. The vast majority (90%) felt a need for professional training.

Recognizing patients' health problems The problems the nurses recognized in RA patients included most of all a progressive physical disability, pain and swelling of joints. They also recognized bouts of low spirits, depression, giving up, difficulty to accept the disease, fear of pain and deformity. As far as self-care is concerned, they noticed patients' problems with doing everyday activities.

Patient education The vast majority of the surveyed believed that patient education is an important element of RA treatment (*Tab. 3*) and declared willingness to take an active part in it.

The nurses with longer experience (>10 years) used didactic aids in their educational work more often than the remaining group of nurses (p=0.04). It appeared that 56% of nurses did not use any didactic aids in their educational work with the patient. The surveyed believed that the best methods of working with the patient are, most of all, an individual conversation, a discussion and a chat.

The nurses were of the opinion that the most important ways of limiting disease effects and a progressive physical disability are physical activity and rehabilitation (74.9%) as well as taking medication (36.6%) and keeping a correct body weight (22.3%).

Over 60% of the surveyed reported that in their clinic/ward there is no organized education for RA patients (*Fig. 2*). The nurses who declared participation in education realized it by means of individual conversations and chats, using such didactic aids as prepared leaflets, medical magazines and newsletters. The conversations concerned mainly the rules of RA nursing and the methods of improving physical fitness.

Discussion

The research results analysis indicates that the main health problems of RA patients were as follows: pain, morning joint stiffness, a progressive physical disability, general discomfort, weakness and bouts of low spirits and feeling down. The surveyed nurses noticed similar health problems in their patients. The disease symptoms of the surveyed patients intensified with disease duration, which influenced their emotional state and caused a worse frame of mind. In her research Kossakowska also states that rheumatoid arthritis often co-exists with depression symptoms, which can occur in every third patient, with, most often, low or moderate intensity [6]. It is confirmed by other researchers, who diagnose depression of low intensity in about 20-36% of RA patients [7,8].

Also the disease duration significantly influences the subjective evaluation of health. The majority of patients with disease duration up to 5 years evaluated their health as bad.

The adaptation to the situation of the disease must include the elements of coping with the disease itself, the treatment etc. as well as with the life changes that the disease brings about. Shaul describes the adaptation process of nurses, who subsequently go through the stages of uncertainty and learning about the disease, followed by discovering methods of coping and strategies. As a result of such a procedure, they have become experts in managing their own disease and developed an ability

of coping with its symptoms [9]. Other research by Newbold also shows that RA sufferers need support and advice in the early stage of the disease to help them adapt to the new changed circumstances [10].

In the light of own research, rheumatoid arthritis, in the vast majority of cases, affected pensioners and retirees (68%). The disease, by causing disablement, excludes patients from fulfilling their professional functions, which has also been shown in the research by Kossakowska, where 80% of the studied patients were professionally inactive and most of them received a pension [6].

A considerable percentage of respondents (45%) claim to exercise and walk every day, regardless of disease duration. Some patients knew that, apart from pharmacological treatment, they should also have dietetic treatment – eat light dishes with low animal fat, but 70% of them did not follow these recommendations. In subject literature there are reports proving that diet is an equally important element supporting the therapeutic process. A light diet, basing on unsaturated fatty acids, is recommended as it does not strain the joints [11].

It is very worrying that over 67% of respondents declared a lack of knowledge about their disease. The shorter was the RA duration, the lower was the patient's knowledge. In the research conducted by Neville et al., the factors influencing the patient's interest in his/her disease were analyzed. It has been ascertained that it is mostly conditioned by the level of paint and disablement [12].

The nurses differed in their evaluation of the importance of patient education in the process of complex therapy of patients. Those with up to 10 years of experience attached more importance to this kind of procedure. The role of patient education is emphasized by many authors. According to researchers, education is one of the ways to limit disablement in rheumatic diseases and to improve the patients' quality of life [13,14].

The fact that the role of the nurse as an educator is changing was indicated by the opinion of 88% of the studied, who declared a willingness to take an active part in RA patient education.

The studied patients declared a willingness to enlarge their knowledge about RA. Similarly to nurses, they preferred different active forms of educational work, in particular a discussion, a chat and individual conversations. Such forms of patient education are widespread and recommended in literature [2]. It is especially emphasized that the information should include practical advice, which should be comprehensible and clear for the patient [12,15].

It seems that education in rheumatic diseases can significantly influence the level of the patient's functioning in the physical, psychic and social sphere, their adaptation and, as a result, ensure a better comfort of life with a chronic, progressive disease. Thus, it should be included to the complex therapeutic procedure in RA.

Conclusions

1. Chronic rheumatoid arthritis is the cause of pain and progressive disability, which makes self-care very difficult and significantly influences the patients' frame of mind and self-evaluation of health.

2. The surveyed patients, especially those in early stages of rheumatoid arthritis, admitted to a lack of knowledge about the disease, the rules of behaving and self-care, and declared a need to improve it.

3. Patient education is realized to a small extent, in the form of individual conversations and chats with patients, with the use of leaflets, brochures and medical magazines.

4. Nurses believe that education plays a significant role in the process of complex patient therapy and declare a willingness to participate in patient education, to which, however, they must be methodically prepared.

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Nutrition and environmental risk factors of deaths of men in the Podlasie Region

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Abstract

The aim of the study was to determine the risk factors in early deaths of men living in the north-eastern region of Poland.

The study involved a population of 1000 men employed in an industrial firm in the region. The observation was carried out in the years 1987-98. At the start, the age of the men ranged between 25 and 54 years (mean 35 years). Health problems of men included hypertension, ischaemic heart disease, as well as deaths and their causes. Environmental, economic and social conditions, nourishment and dietary habits with reference to health state were evaluated. The findings were elaborated using logistic analysis and the method of proportional Cox gambling.

During the 11-year observation period 40 men died, including 17 due to cardiovascular disorders. The overall risk factors were age, marital status (single) and increased alcohol consumption. Predictors of death due to cardiovascular diseases included age, abnormal arterial blood pressure and low intake of carbohydrates and vitamin C.

Key words: cardiovascular diseases, risk factors, social and economic conditions, nourishment and dietary habits, morbidity, mortality.

Introduction

The most common causes of death in highly developed countries include cardiovascular diseases, cancer, injuries, accidents and poisoning. The fact that cardiovascular diseases are common in the entire human population including Poland [1-3] draws particular attention. Such an unfavourable state of health is inseparably linked with an unhealthy lifestyle, especially insufficient physical activity, wrong dietary habits, smoking and an excessive consumption of alcohol [4-7].

Research on causes of death has been conducted for many years in highly developed countries resulting in preventive programs for specific populations [4,6-8]. In Poland the subject is only dealt with in a handful of research centers and the amount of data on the whole population of Poland is still noticeably small [9,10].

The aim of this study was to determine the risk factors of early deaths of men living in the north-eastern region of Poland.

Material and methods

The study covered a population of 997 men aged 25-54 employed in an industrial company in the Podlasie Region.

The initial observation was carried out in the years 1987-98. After the initial observation the research was repeated for the first time in the years 1987-99; the research was repeated for the last time in the years 1996-98. Every man was examined after the period of 9 years.

Economic and social conditions, nourishment and dietary habits of the examined men were evaluated. Every person was subject to a thorough medical check up; additional laboratory testing and electrocardiographic monitoring were performed; furthermore specialists in particular areas were consulted. Arterial hypertension was recognised at the start of the medical examination process in accordance with the guidelines of FAO/WHO that were in force in 1987. Following these guidelines arterial hypertension was recognised when systolic pressure was ≥160 mmHg and diastolic pressure was ≥95 mmHg. Such values correspond to moderate arterial hypertension according to the currently valid classification.

The men's lifestyle was evaluated on the basis of the way

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Table 1. **Change in the number of men suffering from arterial hypertension and ischaemic heart disease out of 630 men observed over the period of 9 years**

		Ist examination	IInd examination
Men suffering from arterial hypertension	n	93	187
	%	14.8	29.7
Men suffering from ischaemic heart disease	n	5	18
	%	0.8	2.9

I – men examined in the years 1987-89
II – men examined in the years 1996-98

of spending free time (active or passive), the A behaviour pattern, physical activity during the entire day in accordance with FAO/WHO/UNU [11].

The risk factors were classified according to the following criteria: the overall cholesterol ≥200 mg/dl, physical activity according to FAO/WHO/UNU < 1.43, smoking, glucose intolerance or diabetes, arterial hypertension, BMI≥25.

Dietary habits of the examined men were evaluated following an interview about their consumption in the last 24 hours. On the basis of the conducted interview the energetic value of the diet as well as the content of the basic nutrients were estimated. To do so a special computer program was written which underwent a standardization procedure in The Institute of Food and Nutrition. Moreover, the men's dietary habits were determined. The ability of the examined men to self-judge the nutrition was estimated on the basis of a comparison between the qualitative content of the 24 hour food intake according to the methodology by Szczygłowa [12] and the evaluation of their nutrition expressed by the examined men themselves.

The A behaviour pattern was evaluated on the basis of a questionnaire prepared by Wrześniewski [13].

Particulars in the death certificates were a source of data concerning deaths.

The findings were elaborated upon using the statistical computing package SAS applying the method of the Cox Proportional Hazards Model among others.

Results

997 men were examined in the years: 1987, 1988, 1989 in three age groups: 25-34, 35-44, 45-54. The average age was 38,1 then.

After the period of 9 years 630 men were examined again because the remaining ones did not volunteer for the second round of examination; 40 of them had died in the meantime.

Tab. 1 shows the occurrence of arterial hypertension and ischaemic heart disease (ChNS) in the period of 9 years of observation.

During 9 years of observation of 630 men the number of people suffering from arterial hypertension increased from 93 persons (14,8%) in the 1st examination to 187 persons (29,7%). The incidence of arterial hypertension in the examined group of men in the period of 9 years of observation was equal to 19.4/1000/a year.

Table 2. **The numbers of risk factors of ischaemic heart disease occurring at the same time among 630 men in the 9 year observation period**

The number of occurring risk factors		Ist examination n=630	IInd examination n=630	Level of significance p<0.05
0 factors	n	31	27	
	%	4.9	4.3	
1 factor	n	123	98	
	%	19.5	15.6	
2 factors	n	219	188	
	%	34.8	29.8	
3 factors	n	198	195	
	%	31.4	31.0	
4 factors	n	53	107	I-II
	%	8.4	17.0	
5 factors	n	5	12	
	%	0.8	1.9	
6 factors	n	1	3	
	%	0.2	0.5	

I – men examined in the years 1987-89
II – men examined in the years 1996-98

Table 3. **The number and causes of men's deaths in the 9 year observation period among 997 men selected for the 1st examination (years 1987-1989)**

Causes of men's deaths	Deaths	
	n	% of the population
Cardiovascular diseases	17	1.7
Cancers	8	0.8
Injuries, accidents and poisoning	8	0.8
Suicides	4	0.4
Diseases of the digestive system	3	0.3
Total	40	4.0

Relatively few men suffered from ischaemic heart disease in the period of 9 years. In the 1st examination only 5 men (0,8%) out of 630 taken into analysis were found to suffer from ischaemic heart disease; after 9 years 18 persons (2,9%) had ChNS. The incidence of ChNS was equal to 23.1/10000/a year.

Tab. 2 shows the numbers of risk factors of ischaemic heart disease occurring at the same time among 630 men in the 9 year observation period.

None of the 6 risk factors of ischaemic heart disease taken into consideration occurred only in the case of 4.9% persons in the 1st examination and 4.3% persons in the 2nd examination. One of the risk factors occurred in the case of 19.5% persons in the 1st examination and 15.6% persons in the 2nd examination (p>0.05). The percentage of men affected by 4 or more risk factors of ischaemic heart disease rose by 10% in the period of 9 years; 4 of the risk factors were present in the case of 8.4% of men in the 1st examination and in the case of 17.0% of men in the 2nd examination (p<0.05).

The causes of men's deaths in the period of 9 years are presented in *Tab. 3*. 40 men out of 997 who participated in the 1st examination in the years 1987-89 died over the period of 9

Table 4. **Nutrition and environmental risk factors of deaths of men in the 9 year observation period. The risk of death was estimated applying the method of the Cox Proportional Hazards Model**

Dependent variable / Independent variables	The total of deaths n=40			Deaths due to cardiovascular diseases n=17	Deaths due to myocardial infarction n=5
	a.J.	a.J/W	a.Wcz.	a.J.	a.J.
Age (Δ=1 year)	1.09	–	1.10	1.13	1.27
Physical activity according to FAO/WHO (Δ=1 point)					
Smoking (no/yes)					
Marital status (married/single)		2.46	2.39		
Income per person (Δ=1000 PLN)	1.07			1.09	
Education (elementary, secondary/higher)					
Way of spending free time (active/passive)					
Behavioural patterns A (Δ=1 point)					
Arterial hypertension (no/yes)				2.97	6.35
Diabetes (no/yes)					
BMI (Δ=1 kg/m^2)					
Ability to self-judge nutrition (does not possess/possesses)					
Salting dishes (no/yes)					
Total energy (Δ=1 kcal)					
Total protein (Δ=1 g)					
Total fat (Δ=1 g)					
Vegetable fat (Δ=1 g)					
Total carbohydrates (Δ=1 g)	0.997			0.995	
Alcohol (Δ=1 g)	1.008	1.01	1.01		
Vitamin A (Δ=1 μg)					
Vitamin B_1 (Δ=1 mg)					
Vitamin B_2 (Δ=1 mg)					
Vitamin C (Δ=1 mg)				0.977	

a.J. – one-factor analysis
a.J./W. – one-factor analysis with standardization of age
a.Wcz. – multi-factor analysis

years making it 4%. Deaths due to cardiovascular diseases constituted 42.5% (17 people) of all deaths. 8 people died due to cancers and the same number passed away as a result of injuries, accidents and poisoning (8 people). 4 people committed suicide. It was determined that 3 deaths were due to diseases of the digestive system.

Tab. 4 displays an analysis of the risk factors of deaths in total and deaths due to cardiovascular diseases in the period of 9 years.

The risk factors of all deaths of men in one-factor analysis included age, income per person, consumption of carbohydrates and alcohol. The risk of death grew considerably with the increase of age, income and alcohol consumption and it decreased with the growth of the consumption of carbohydrates. In the performed multi-factor analysis age, marital status and alcohol remained as risk factors.

The risk of death due to a cardiovascular disease (in one-factor analysis) grew with age, increasing income and decreasing consumption of carbohydrates and vitamin C. The occurrence of arterial hypertension increased the risk of death in that group of causes almost 3 times.

The predictors of death due to myocardial infarction (in one-factor analysis) were age and most of all the occurrence of arterial hypertension which caused a 6 times increase of the risk of death from myocardial infarction.

Discussion

Applying the analysis method of the Cox Proportional Hazards Model allowed to determine the risk factors of death in the examined group of 997 men observed over the period of 9 years.

Performing one-factor analysis of all deaths (40 deaths) as a whole without considering their causes revealed that their predictors comprised: age, income per family member, increasing consumption of alcohol, decreasing consumption of carbohydrates. Applying a multi-factor analysis allowed to eliminate less significant factors which proved to be income per capita and the consumption of carbohydrates. At the same time it allowed to reveal factors that were connected to a larger extent with deaths in general which finally included age, single marital status and the consumption of alcohol. The single marital status was indicated by other researchers as a risk factor of deaths in

general as well as deaths due to a cardiovascular disease [14,15]. The unfavourable influence of the single marital status can result from an increase of unhealthy behaviour by men remaining in the free status which include among others a smaller consumption of fruit and vegetables (hence a smaller consumption of vitamin C as well) and a larger consumption of alcohol [16]. The fact that the married status led to positive changes of dietary habits was also confirmed by other researchers [14,15]. Some Polish authors emphasise the positive influence of the marriage not only because the changes in dietary habits but also due to the support given by the spouse which often contributes to a considerable reduction in psychological and social stress, especially in the case of men [14,15].

Many authors do research on the issue of alcohol as a risk factor of diseases especially in relation to deaths in general and deaths due to cardiovascular diseases [5,17,18]. A positive influence of alcohol consumption on the death rate due to cardiovascular diseases was shown in Pol-MONICA research [19]. A number of authors underline the fact that only small doses of alcohol have a positive influence on a death rate in general and the death rate due to ischaemic heart disease while larger doses do not have such an effect. This dependence takes the form of a curve "U" or "J" [17,20-24]. However, no positive effect of alcohol consumption was observed in the research "Seven Countries Study" [25]. Finally, the approach that alcohol has a negative effect based on its detailed influence on particular systems and organs prevailed in the medical world [26-28].

The risk factors of death due to a cardiovascular disease in the model of one-factor analysis were age, increasing income per family member, arterial hypertension and a small consumption of carbohydrates and vitamin C. Age and arterial hypertension as a predictor of death due to a cardiovascular disease also turned out to be statistically significant in the research "Seven Countries Study" (covering Finland, Japan, Greece, Holland, Italy and Yugoslavia) [1]. Consumption of fruit and vegetables decreased the risk of falling ill with a cardiovascular disease among 120 000 people living in the USA in an 8-year long observation period [29].

Proving a connection between nutrition and later deaths is extremely difficult. Only in the research "Seven Countries Study" the authors showed a protective role of carbohydrates – it was observed that people consuming larger amounts of carbohydrates had a lower mortality rate from cardiovascular diseases [1]. A similar tendency was also confirmed in the case of fatty acids after 20 years of observation [1].

The research done by the authors of this work revealed that the predictors of death due to myocardial infarction were age and arterial hypertension (6.35-fold risk increase). The results of the research Pol-MONICA Kraków [9] carried out in the country showed that arterial hypertension increased the risk of death from ischaemic heart disease 2,38 times. The research Pol-MONICA Warszawa demonstrated also a significant role played by blood pressure. Arterial hypertension diagnosed in men aged 35-64 at the start of a 10 year observation period increased the chances of their death twofold [15,30]. Such an effect is a result of damages caused by hypertension to many organs mainly the heart and blood vessels [9,18,28].

Conclusions

There were mainly two or three risk factors of ischaemic heart disease occurring simultaneously among the examined men and at the same time the group of men with 4 or more risk factors increased by 10%. After the period of 9 years an increase in the number of people suffering from arterial hypertension and ischaemic heart disease was witnessed.

Over the 9 year long observation period the largest number of deaths – 17 people (42.5%) was recorded due to cardiovascular diseases; in that group 5 men died of myocardial infarction.

The risk of all deaths significantly grew with age, increased consumption of alcohol and single marital status. A nutrition factor increasing the risk of death of an cardiovascular disease was small consumption of carbohydrates and vitamin C together with other factors such as age, income and arterial hypertension.

The population of almost 1000 men was covered by the presented research findings and the observation period was 9 years long. That allowed to demonstrate an influence of social and economic conditions as well as the dietary habits on later deaths of the examined men.

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Preparation the family to care of the patient with Alzhaimer′s disease

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Abstract

Purpose: **Evaluation of the level of the family readiness to look after a person suffering from the Alzheimer's disease.**

Material and methods: **In the research an authorized questionnaire was used, which comprised knowledge concerning the disease, coping with the situation, looking after a patient and an open test.**

Results: **It was shown that the level of knowledge about Alzheimer's disease corresponds to the level of education ($p<0.05$). Most families 67% look after the patient in their own houses, although they don't belong to any support group. Adapting to a new situation is difficult for people, although, most of them devote most of their energy to the patient with the support of the other members of the family. Family support and the level of knowledge aren't related with the patient acceptance ($p<0.05$).**

Conclusions: **Family support and the level of knowledge aren't related with the patient acceptance. There is a relation, however, between the education and the level of knowledge about the Alzheimer's disease.**

Key words: Alzheimer's disease, care, family.

Introduction

The progress of civilisation and medical sciences causes an increase in the number of people advanced in their years. It's been estimated that between 1992 and 2050 the number of people over 65 will from 6.2% to about 20% of the population. Therefore, senile dementia becomes more prevalent, and this kind of disorder is diagnosed in about 8 to 10% of people over 65 years old [1-3]. The most frequent cause of dementia is Alzheimer's disease, a chronic, progressive and irreversible brain dysfunction leading to the state of dementia. Short-term memory is early affected. Then, visually spatial disorders and cognitive dysfunctions concerning attention, communication, thinking, perception and planning, which causes worsening of well-being and an increase of emotional liability, appear [4,5]. Patients become more irritable and their attitude towards the closest people changes. Progressing personality changes are usually characterised by initiative and responsibility decrease and apathy growth. High level of aggression and hostility can be observed in patients with diseases personality. As the disease gets more advanced difficulties, concerning any life activities and contacts with the outside world, develop until those activities become impossible [6,7].

The disease frequently develops slowly in the environment of stabilised family life, where everyone has his/her particular role. It changes family's life situation seriously, but family members are neither able to control course of the disease nor take nursing care of the patient [8].

Family adaptation to the new situation, conditioned on the disease, is difficult and requires many changes, but most of all, an understanding of the disease essence and development of proper care attitude are necessary [9].

The purpose of this study was to recognise a level of family preparation to take care of a person suffering from Alzheimer's disease.

Material and methods

In order to gather data the following tools were used: (1) questionnaire form including items assessing level of knowledge presented by the family members, organisation of care and

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ways of handling of an Alzheimer's patient, (2) evaluation scale of family approval of a sick person, (3) test built of unfinished sentences, which recognise family adaptation to new situation.

The study was conducted in 2003 and families of patients with Alzheimer's disease treated in The University Hospital of Cracow, outpatient clinic of The Memory Dysfunction, Psychiatry Clinic were examined.

Results

The study group comprised of 30 people taking care of patients with Alzheimer's disease, 19 (63%) were females and 11 (37%) were males. The majority of the respondents (37%) were between 41 and 60 years old, 33% – 20 to 40 years old and 30% were from 61 to 80 years old. The mean aged mounted to 41 years old, women 50.

Eleven respondents (37%) received secondary education, 10 (33%) – university education, and 7 (23%) – vocational education. 26 participants (87%) had close family and 4 of them were lonely. Office work and pension were the most common livelihoods (10 participants – 33%). 18 respondents (60%) lived in the country and 12 (40%) in the city. Almost half of the group (14 = 47%) had good financial situation, 40% – medium, 10% – bad and only one person had a very bad financial situation.

It was estimated that 80% of the respondents presented good level of knowledge about Alzheimer's disease. More than 90% of the participants knew that both men and women suffered from Alzheimer's disease and the aim of the Mini Mental State Examination scale. According to 60% of the respondents the main cause of patient's fall was: waxing the floor (60%), lack of rugs or doorsteps (17%), and lack of handrails (10%). The respondents named the following causes of burn risk factors: working hair dryer (50%), switched off electrical equipment (30%), closed gas (10%), and controlled smoking (10%). For 30% of the respondents the disease lasted 8 years, for 20% – less than 3 years, for 10% – to 15 years and 40% of the sample didn't know how long this disease could last. There is a relation between education level of the family members and the level of their knowledge concerning Alzheimer's disease. The test Student's significance level p was lower than 0.05.

Care of the patient and organise their lives in the families

Most of the families take care of the patient and organise their lives. Ninety percent of the respondents lived with their families, and 10% lived separately. Forty percent the participants took care of their sick relative 24 hours a day, 23% spent with the patient 2 hours a day, 7% – 5 hours a day, while every fourth participant met the patient two times a week. The vast majority of the sample (67%) didn't take advantage of any kind of help and didn't even consider it. One third of the respondents took an institutional care into consideration. Twenty three percent of the participants took advantage of social welfare centre, 7% had a surrogate carer, and only 1 person stayed in a day-care centre. Forty three percent of carers could count on the support, 40% – sometimes and only 17% of family members said they could always count on help. Only 23% of the sample participated in a support group and 77% didn't use that kind of help at all. Sixty seven percent of the respondents believed that their care of the patient caused limitation of family social relations, 20% of the participants found new friends and 13% was convinced they had lost not only their acquaintances but also their friends.

Cooping methods with disease Alzheimer's. As far as the ways of spending free time were concerned, 33% of the sample was thinking up simple activities of everyday life, 10% read books to the patient, 27% went for a walk, and 30% didn't take any actions.

More than half of the respondents (53%) helped the patient with remembering through frequent repeating, 20% didn't move things around the house, and 27% didn't do anything. The most common form of communication was verbal contact and touch (47%), 43% kept only verbal contact and 10% of the sample were silently present.

In the case of communicational difficulties, 63% of the group dealt with this problem by speaking slowly, 17% – waited patiently, 13% – left the patient alone, and 2 respondents admitted they had raised their voice. When excitation of the patient was discussed, 40% tried to talk to the patient and draw his/her attention away, 10% limited the choice, 2 respondents raised their voice, and one left the patient on his/her own.

If the patient left home and lost the orientation, more than half of the group (53%) said they looked for him/her unaided, 27% informed the police, relatives and friends. Only 3 participants claimed they waited calmly until the patient returned home, and the same number didn't do anything about it but felt guilty. As far as gathering things was discussed, 20% of the participants searched the lost thing, only 2% gave something in return or they do nothing.

Seventeen percentage of the respondents took a walk in the situation when the patient suffered from insomnia, 13% – suggested the patient some music, 10% left the patient alone, 7% raised their voice, and one person prepared a warm bath.

Patients who suffered from urinary and faecal incontinence, 50% of the carers used nappies, 40% – washed the patient, 13% didn't do anything and one person reduced fluids.

Adjustment to the new situation. The analysis of the unfinished sentences test showed that 26% of the respondents felt that adjustment to the new life situation was hard and difficult. However, 34% believed that life, despite all the difficulties caused by care for the Alzheimer's patient, was a valuable gift, and the disease accounted for the worst hopelessness for 69% of the respondents. So, health seemed to be the biggest value and the most expected one (for 43% of the participants). Almost 20% of respondents wanted peace, and 30% – freedom and well being. The smallest group wanted love (7%). The disease brought a lot of suffering instead, and other's help was very valuable to 37% of the respondents, it was a gift for 2% and for 10% it was a duty. Only three participants claimed they didn't need any help. Almost 50% of the sample devoted their energy to the patient, 23% – towards their job, 20% – their family, and 10% directed their energy to their own development and education. 33% of the group needed constant support from their families, 20% waited for help from other people, 10% demanded motivation, and the same number needed approval in order to continue care for the Alzheimer's patient.

Despite the difficulties concerning patient's care 32% of the sample were usually bright. However, 33% (almost the same number) were susceptible to cry. Fifteen percent showed patients, a little less demonstrated fatigue and depression and 9% – self-control and calmness. 20% of the respondents manifested susceptibility to remorse, 17% to anger, 13% to meditations, and 7% regretted their decision.

The analysis of the acceptance scale showed that 60% accepted the patient fully and appreciated patient's work and efforts 33% of the sample very seldom criticised the patient and weren't ashamed to talk about the disease with others. 37% didn't fully accept the patient, but they considered patient's needs and expectations. Conflicts were solved openly and directly. Only one person didn't accept the patient and couldn't get closer. Only 10% didn't allow the patient to decide for him/her own even in the simplest matters of every day life. The test Student's correlation on the significance level $p<0.05$ between the acceptance of the Alzheimer's patient and level of knowledge showed by the family members and support received from the family turned out to be of no meaning.

Discussion

On the basis of the research, which has been carried out, the analysis of its results as well as observations and considerations of the people involved the conclusion appears that, apart from providing the family with appropriate knowledge about Alzheimer's disease, it is also extremely important to make them realise the patients' needs towards those, who are nursing them. The acceptance of the patient by his or her family means positive attitude, respect towards his or her individuality and care shown in every situation. Family, which fully accepts its ill member, is characterised by the ability of active and understanding listening and assuring patient's psychological needs. These needs were described by The American Alzheimer Association as extremely important as far as the quality of Alzheimer patients' nursing is concerned [10].

In summary there is a between the level of education and the level of knowledge concerning Alzheimer's disease. The level of knowledge presented by the family members and support received from the family have no relation with acceptance of the patient.

Actions aiming at increasing approval of the patient shall be improved through developing support groups and self-help.

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The role of the therapeutic team in shaping eating habits and lifestyle in children with dietary calcium deficiency

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Abstract

Purpose: Assessment of the effect of low-calcium diet on bone mineral content in children and adolescents.

Material and methods: The study involved 89 children (49 girls and 40 boys) aged 5-18 years, in whom diseases affecting bony metabolism had been excluded. Children with a history of dietary calcium content below 500 mg/day were recruited. The study group was divided according to age: group I, age 5-9 years (children before puberty); group II, age 9-15 years (early puberty); group III, 15-18 years (late puberty). Dual energy X-ray absorptiometry (DEXA) was used for densitometric measurements. Bone mineral density (BMD) was assessed in the whole skeleton (total BMD), in vertebrae L2-L4 (spine BMD) in g/cm^2 and as Z-score. Concentrations of Ca, Ca^2, P, activity of alkaline phosphatase (AP) and its bony isoenzyme were determined in the serum.

Results: Total bone mass below 5th percentile (according to the norm for age and gender) was found in 56.98% of the children involved in the study. A significant reduction was noted in the spine mineral mass in boys ($p<0.01$) as compared to girls (0.731 ± 0.17 g/cm^2 and 0.835 ± 0.19 g/cm^2, respectively).

The lowest mean Z-score (-1.850) was observed in group III as compared to group I (-1.194) ($p<0.01$) and group II (-1.201) ($p<0.05$). There were statistically significantly positive correlations between total and spine BMD and BMI. The correlation coefficient was $r=0.56$ and $r=0.41$ ($p<0.001$), respectively.

Conclusions: In the majority of the children (c. 60%), a reduction in bone mineral content was found. The lowest Z-score (-1.850) was revealed in the oldest children, which may disturb the process of reaching the optimum level of the peak bone mass.

Key words: calcium intake low, bone mineral density, children.

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Introduction

It is commonly accepted that the peak bone mass reached by a man at the age of 25-30 is to a large extent subject to genetic control. Genetic determinants are non-modifiable risk factors of osteoporosis [1,2].

However, the effect of modifiable factors associated with lifestyle and nutrition on normal mineralization of the skeleton at any age, but especially at the skeleton growth cannot be excluded [3,4].

Elimination of these factors is the major task of osteopenia and osteoporosis prevention.

Material and methods

The study involved 89 children (49 girls and 40 boys) aged 5-18 years, referred to The Outpatient Rheumatological Department of Children's Teaching Hospital in Białystok due to motor organ pains. In all the children, inflammatory arthropathies, metabolic and endocrine disorders, and other ailments affecting bony metabolism were excluded. Data on dietary calcium intake were obtained via a standardised interview. The children with a history of low dietary calcium content (below 500 mg/day) were recruited. The study group was divided according to age: group I (children before puberty), age 5-9 years; group II (early puberty), age 9-15 years; group III (late puberty), 15-18 years.

Anthropometric parameters (height, weight) were measured and body mass index (BMI) was calculated in the study groups.

Table 1. **Characteristics of the study group with regard to gender and age**

	Age (years)	Height (cm)	Weight (kg)	BMI kg/m^2
Girls n=49 (55.1%)	12.75±3.78	147.83±17.15	39.25±10.81	17.54±2.39
Boys n=40 (44.9%)	11.79±3.29	149.48±20.44	43.56±16.97	18.64±3.62
Together n=89 (100%)	12.32±3.5	41.19±18.61	41.19±14	18.04±3.03

Table 2. **The percentile structure of bone mineral content (according to norms for age and gender)**

BMD percentile	Total BMD n = 89		Spine BMD n = 89	
	n	%	n	%
below 5th	49	56.98	45	51.95
5-25	26	29.21	29	31.10
above 25th	14	15.73	15	17.05

Table 3. **Bone mineral density with regard to gender and chosen anthropometric parameters**

Parameter	Girls			Boys			
	Mean	Mediana	SD	Mean	Mediana	SD	p<
Age (years)	12.75	13.00	3.78	11.79	12.00	3.29	NS
Height (cm)	147.83	153.00	17.15	149.48	151.00	20.44	NS
Weight (kg)	39.25	41.00	10.81	43.56	44.50	16.97	NS
BMI kg/m^2	17.54	17.43	2.39	18.64	18.07	3.62	NS
Total BMD g/cm^2	0.912	0.933	0.10	0.903	0.923	0.11	NS
Spine BMDg/cm^2	0.835	0.859	0.19	0.731	0.716	0.17	0.01
Z-score	-1.379	-1.510	1.14	-1.339	-1.720	1.12	NS

Table 4. **Bone mineral density in the study group according to age**

	The study group n=89						
Age (years)	**Group I** 5-9		**Group II** 9-15		**Group III** 15-18		
Z-score	mean	SD	mean	SD	mean	SD	p<
BMI kg/m^2	15.58*	1.98	18.85	3.36	18.5	1.55	0.001
Total BMD	0.786*	0.07	0.913	0.08	1.010	0.06	0.001
L2-L4 Spine	0.565*	0.09	0.789	0.15	1.001	0.07	0.001
Z-score	-1.194	0.85	-1.201	0.93	-1.850**	0.49	0.05

*p<0.001 compared to groups II and III; **p<0.05 compared to groups I and II

Clinical assessment allowed identification of children with a positive history of fractures.

Dual energy X-ray absorptiometry (DEXA) was applied for densitometric measurements, using DPX-2 System (LUNAR), Radiation Corp, in a 1.3z version. Bone mineral density (BMD) was evaluated in the whole skeleton (total BMD), in vertebrae L2-L4 in AP projection (spine BMD) in g/cm^2, in percentiles according to the norms for age and gender [5] and as Z-score (the number of standard deviations differentiating bone density of the study patient from the finding obtained in a statistically healthy subject matched for gender, race and age).

Concentrations of Ca, Ca^2, P, activity of alkaline phosphatase (AP) and its bony isoenzyme were determined in the serum.

Statistical analysis

The results of the study were analysed statistically with the use arithmetical means. The level of investigated parameters in the subgroups was compared with t-Student test or U Mann-Whitney test (depending on the distribution of the parameters). Person linear correlation ratio was used in order to evaluate the correlation ratio between the parameters. Alternative hypotheses were considered true when p<0.05.

Results

No significant differences were noted in BMI in relation to gender. However, the assessment of chosen anthropometric parameters shows a significantly lower BMI in group I (15.58) as compared to groups II and III (18.85 and 18.50, respectively); (p<0.001) (*Tab. 1*, *Tab. 4*).

Total bone mass below 5th percentile was observed in 56.98% of the children enrolled in the study; in 27.21%, bone mineral density values were within 5-25, while in 16.73% above 25th percentile (*Tab. 2*).

A significant reduction was found in the mineral mass of the spine in boys (p<0.01) as compared to girls (0.731±0.17 g/cm^2 and 0.835±0.19 g/cm^2, respectively (*Tab. 3*).

Table 5. **Significant correlations of BMD and Z-score with chosen anthropometric parameters**

Bone Mineral Density	Total BMD		L2-L4 BMD		Z-score	
	r	p<	r	p<	r	p<
Age	0.82	0.001	0.83	0.001	-0.20	0.05
Height	0.81	0.001	0.80	0.001	0.02	NS
Weight	0.80	0.001	0.71	0.0001	0.09	NS
BMI	0.56	0.0001	0.41	0.0001	0.07	NS

The lowest mean Z-score (-1.850) was observed in group III as compared to group I (-1.194) ($p<0.01$) and group II (-1.201) ($p<0.05$). There were statistically significantly positive correlations between total and spine BMD and BMI. The correlation coefficient was $r=0.56$ and $r=0.41$ ($p<0.001$), respectively.

Findings of basic serum laboratory parameters of mineral balance were within normal limits for age, although significantly lower Ca^2 and P levels were noted in the serum of girls ($p<0.05$). Significantly negative correlations were revealed between total and spine BMD and AP ($p<0.05$): (-0.515) and (-0.472), respectively.

Thirteen children had a positive history of fractures (14.68%), the percentage being higher in group II (10.11%) and definitely higher in boys (11.31%). Interpretation of the study outcome is difficult due to a small number of subjects involved in the study.

Discussion

Bone is a living tissue subjected to the opposing remodelling processes: formation and resorption. Bone remodelling occurs throughout life. In childhood and adolescence the predominance of osteoblastic bone formation results in skeletal mass growth, while bone-loss processes intensify since 6th decade of life [6-8].

Size, mass or density of the bone – terms commonly used as synonyms – is strictly dependent on age, with its peak bone mass controlled by the genetic code [9,10].

The peak bone mass is 90 per cent deposited during the period of growth, which lasts up to the closure of the epiphyses, i.e. to the age of 20 years.

The maximum value of peak bone mass is obtained during the so-called skeletal consolidation period (25-35 years). It is a specific "bony mineral bank" – since according to epidemiological data, low peak bone mass is a major risk factor of osteopenia and osteoporosis in later life [11,12].

Thus, childhood and adolescence are the critical periods for bony tissue development.

Proper diet and healthy lifestyle can prevent low bone mass [13,14]. Models of eating habits are handed down within the family in the early childhood up to approximately 10 years of age and then become fixed as routines. Research studies carried out by The Institute of Food and Feeding in Warsaw on the nutrition modes of Poles have revealed a greatly inadequate dietary supply of calcium and vitamin D, which are responsible for normal mineralization of bones, as well as high content of phosphorus from food additives (with phosphorus excess, calcium chronically obtained from bones increases the risk of their demineralization) [15].

In the current study, approximately 60% of calcium-deficient children had low bone mass (total BMD and spine BMD <5th percentile in relation to age and gender). Bone mineral density expressed as the mean Z-score was the lowest in the group of adolescents over 15 years of age (-1.86 ± 0.49), who despite already active sexual hormones are in danger of low peak bone mass and osteoporosis in the future.

Our findings seem to confirm the fact that mineralization disorders appear in the spine at the earliest, which is associated with its trabecular structure. We found statistically significant differences between bone mass for L2-L4 as compared to total skeletal mass: in boys – spine BMD 0.731 ± 0.17 g/cm^2 and total BMD 0.902 ± 0.11 g/cm^2; in girls – 0.911 ± 0.10 g/cm^2; 0.835 ± 0.19 g/cm^2, respectively ($p<0.01$). Literature data indicate that metabolism in the trabecular bone is 8 times higher; mineralization disorders occur earlier and are more advanced [16].

Many researchers emphasize that for normal bone growth and mineralization children and adolescents should receive adequate amounts of calcium and vitamin D, supplied in everyday diet and pharmaceutical preparations if need be. Moreover, to be effective, vitamin D requires a varied diet and active leisure in the open air [17,18].

Badurski et others stress the significance of osteoporosis prevention, which should concern the whole population and include education on the environmental risk factors and proper lifestyle, intensification of physical activity, daily calcium intake of approximately 1200 mg and vitamin D of 400-800 IU [19].

Our own observations confirm the unquestionable role of preventive actions especially in the developmental age population. Prevention of osteoporosis, a dangerous civilization disease, should be a primary task of the therapeutic team.

Conclusions

1. Densitometric findings showed a reduction in bone mineral density in most of the study children (c. 60%).
2. Osteopenia expressed as Z-score (-1.850) was found in group III (the oldest children), which may preclude reaching the optimum level of peak bone mass.
3. Our research indicates that it is necessary to introduce a public prophylactic scheme to prevent osteopenia and osteoporosis in children, especially at the beginning of puberty.

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The role of a therapeutic team and The Pol–Ilko Association in readaptation of patients with a stoma to the life in a family and society in the 21st century

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Abstract

Patients who crossed operation where exteriorization stoma was integral her part the aside from of cause, location and far-gone of illness which hereinto brought require special care. In moment of entry we to European Union should advert on introduction by us the surgeons of new operating techniques not only, but to attach importance to quality of sick's life after operations also, particularly these which violate beauty of our body. They are of the patients' groups the nation from stoma, particularly if cause the exteriorization stoma the state the neoplasmic disease of alimentary canal or arrangement urinary. The stay in Clinic whether the surgical squad, perspective of operation which is final effect producing artificial accompanying urinary content tract intestinal or fecal it joins with high-level of phobia. The Information Bureau for Stoma in year 1993 at Medical University was created and on the basis of this the information bureau the therapeutic complex worked out own model of these patients' care over group. The model of care over sick from stomy hugs three periods: preoperative, early and late surgical period (ambulant).

On the basis of The Information Bureau from Stoma in 1994 year The Department was created of Podlasie the Society of Care over Patients from Stoma in Białystok – association of working on thing sick's good. Organization this assembles from stomy the men, their family and guardians, workers of medical service and different men of good will. Meetings are forms of working, which performance of bothering patient's problems connected with nurturing and supply stomy is aim, and also psychical and help support in readaptation to life in family, company and society. The volunteers' training is to help different form of working this sick's group. Volunteer in this case – then living from stomy over year happily, adopted to life in every respect, person which exemplifies for sick prepared to operation positive (exteriorization stoma) or beginning one's "path stoma".

Both the analysis and opinion of work of therapeutic complex, as and the workings The Association be made by only patients, their family and guardians, and also the workers of medical service. The elaborate model of care over sick from stoma on the basis of Information Bureau is accepted universally and resoluteness improves quality of life of this patients' group. Patient in XXI age from stomia on Podlasie it can appropriately living in family, work professionally, grow sport and hobby not only thanks to work therapeutic complex, but also and men who earlier found oneself in similar situation, as he alone.

Key words: therapeutic team, patients with a stoma.

A stoma, in case of some abdominal disorders is an integral part of a surgical procedure and is established permanently, or reduces the tension beneath the anastomosis or the anastomoses of the gastrointestinal tract or urinary tract. In children, it is usually one of the stages in the treatment of congenital defects or the preparation to the final corrective surgery. After operation, something new, which works permanently and extracts urine, feces or gastric contents appears in the abdomen of a patient. It disturbs a patient's image, changes his/her figure and influences his psychical state. Patients, who underwent an operation, in which a stoma was an integral part of the procedure regardless of the disorder, its localization and severity, require a special care [1,2]. This situation forces The Health Care Institutions at various levels to create and realize the standards of therapeutic and nursing procedures. After Poland joining The European

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Union, surgeons should not only pay attention to the introduction of new operational techniques, but also to the quality of life of patients after operations, especially these distorting the beauty of their bodies and influencing significantly their mental state. Patients with a stoma belong to this group, especially when the disorder causing this surgical procedure is cancer of the gastrointestinal or urinary tract [3,4]. At present, when media propagate the beauty of the human body and present the methods of caring and keeping physical and mental conditions fit, a stoma present on the abdomen is seen by people as the cause of unfavorable appearance. A stoma is treated as a personal tragedy or a sentence regardless of the cause, which forced the operational team to perform this type of the solution. A patient's stay in hospital (the department or surgical ward) and the prospect of the operation, which will result in the creation of a stoma – an artificial way of urine, feces and gastric contents excretion is closely connected with a high level of anxiety. It persists not only in the perioperational, but also postoperational period. The unknown, uncertainty and lack of safety cause the fear in a patient. Taking into consideration all these factors mentioned above, there is a demand for therapeutical teams, which would take care about a patient at each stage of the treatment, his satisfactory mental and physical state, would restore his psychical balance and help readapt to the life in a family and society and his probable return to a professional career. In 1993, The Outpatient Clinic for Patients with a Stoma was established in The Medical Academy of Białystok and basing on this, a therapeutical team worked out its own model ensuring the continuity of the care about a patient [3,5-7]. It includes three periods: preoperational, early and late postoperational (ambulatory).

The preoperational period consists of:

- talking with a patient, presenting the type of operation, justifying the choice of this method basing on the subjective, objective and accessory examinations,
- getting to know each other [8,9],
- evaluating a patient's psychical state,
- estimating a patient's family, professional and social situation,
- evaluating patient's present knowledge on the diseases and the type of operation, determining the site of a stoma regarding a patient's different positions and his preferences [10,11].

The postoperational period consists of:

- protecting of a stoma in an operational theatre [12],
- customized stoma appliances chosen individually,
- teaching a self-care of a stoma connected with up-dated information on a patient's state,
- contacting a patient's family or his caretaker,
- psychical support [1].

Basing on the observation of our patients, it has been proved that a therapeutical team's care is essential in the perioperational period. A patient has the feeling of safety, not being left alone with his disease and such a significant change in his appearance. Teaching the self-care of a stoma in the early postoperational period enables to get used slowly to a new situation and believe that it is possible to return to the life in a family, society and to a normal professional career. The appropriate care of a stoma and selection of appliances are very important in this period. Patients are oversensitive about unpleasant smell, so all measures must be undertaken to protect a stoma with stoma appliances and to guarantee the air, fluid tightness, and in this way creating the feeling of safety. In this early period, any event like the leak of feces, urine or gastric contents makes a patient feel nervous, frustrated or even depressed and he/she secludes himself/herself from the surroundings and the hospital environment. It would be ideal to hospitalize patients with a stoma separately, but when patients with a stoma are placed in a hospital room with other patients, the care of a stoma or the exchange of the appliances should be done in a separate room. Our observations indicate that these patients admit unwillingly to having a stoma to the outsiders and 67% of them conceal this fact, even when visiting the doctors of other specialties. Similarly, when they are waiting for an appointment and are asked by other patients what The Outpatient Clinic for Patients with a Stoma deals with, they explain that it is The Outpatient Clinic of Proctology.

In the late postoperational period (ambulatory), patients are divided into two completely different groups: patients, who were taken care of in the perioperational period and are still cared about in our Outpatient Clinic and patients who were operated on in other hospitals and were referred to our Outpatient Clinic where they are informed and taught about a stoma for the first time. In the late postoperational period, our therapeutical – nursing activities include:

- consolidating the knowledge and skills connected with the care of a stoma
- solving other health problems – enuresis, proctorrhea, pain, supplementing hydroelectrolyte deficits in gastrointestinal disorders,
- dietary recommendations ensuring a normal stoma functioning,
- contacts with a patient adapted to the life with a stoma,
- consolidating a patient's psychological attitude concerning a normal life with a stoma,
- advising the family and caretakers about solving a patient's life problems,
- contacting a patient with a volunteer or other patient with a stoma who adapted to the life with a stoma and feels happy,
- colorectal irrigation,
- making the literature concerning a stoma care available to a patient, informing a patient about the activity of The Polish Care Society of Patients with a Stoma (PolIlko).

Since in this period many local complications of a stoma are observed, patients are given medical and nursing advice about the provision of the appliances and qualification for a probable operational procedure [12-14].

Apart from therapeutical teams of The Outpatient Clinic for Patients with a Stoma and an organized professional care system, support groups and societies helping patients play an important role in a patient's readaptation to the life with a stoma. This refers also to all patients with chronic diseases. In 1994, in Białystok The Podlaski Branch of the Polish Care Society of Patients with a Stoma was founded on the basis of The Outpatient Clinic for Patients with a Stoma of The Teaching Hospital of The Medical University of Białystok. This organization works for a patient's good and embraces patients with stoma, their families and caretakers, health care workers

and other people of goodwill. Meetings are one of its activities, which aim at presenting the problems affecting patients connected with the stoma care and service as well as mental support and help in the readaptation to the life in a family, community and society. Training volunteers to help patients belongs to other forms of its activities. In this case, a volunteer is a person who has lived happily with a stoma for more than a year, has been adapted to the life in every aspect and who is a positive figure for a patient prepared for a procedure of creating a stoma or beginning this 'stoma path' [15]. A therapeutical team's work and the activity of The Society are analyzed and evaluated by patients, their families and caretakers as well as by health care workers. The model of the care about patients with a stoma worked out on the basis of The Outpatient Clinic is widely accepted, ensures the continuous care and improves significantly the life quality of patients with a stoma. In the 21st century, in the Podlasie Region, a patient with a stoma can live with dignity in the family, work, do sports and have a hobby thanks to not only a therapeutical team's work, but also other people, who experienced the same situation earlier and are ready to help others.

'Going through the life, leave the trace,
which will be a signpost to happiness for
other people'

Norbert Nieslony

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Quality of life in healthy children and in children with tension headaches – a comparative analysis

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Abstract

Purpose: The aim of this study was the assessment of the quality of life of children and adolescents with tension headaches in comparison with healthy peers.

Material and methods: The study was conducted on 135 middle school and high school students in Poznań and on 86 children with tension headaches, that were treated in the out-patient clinic of The Chair and Clinic of Development Age Neurology of Karol Marcinkowski University of Medical Sciences in Poznań. The research tool for both groups was Pediatric Quality of Life Inventory, version 4.0 (PedsQL 4.0) questionnaire.

Results: In the analysed groups dominated 14- and 16-year-old children. Among children with tension headaches, the ailments usually appeared once or twice a week in 39 (45%) of them. With the use of the PedsQL 4.0 questionnaire the following fields of activity were analyzed: biological, emotional, social functioning and mood.

Conclusions: The biggest discrepancies between the group of healthy children and those with headaches were noted in the field of emotional functioning and mood. Adolescents with tension headaches more frequently reported the feeling of fear and sleep disorders in comparison to healthy students. Children with headaches look at the future in a more pessimistic way and are less satisfied with their lives.

Key words: quality of life, headaches, children.

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Introduction

Headache is a common problem in developmental age. It exists in 30 to 50% of children as young as seven years of age, the number growing to 90% in teenagers [1-4]. Bothersome and long-lasting headache usually has a negative impact on child's bio-psycho-social condition, making the child more sensitive and withdrawing in contact with peers. The appearing limitations in children's functioning lower their subjective judgment of the quality of life.

The aim of this study was the assessment of the quality of life of children and adolescents with tension headaches in comparison with healthy peers.

Material and methods

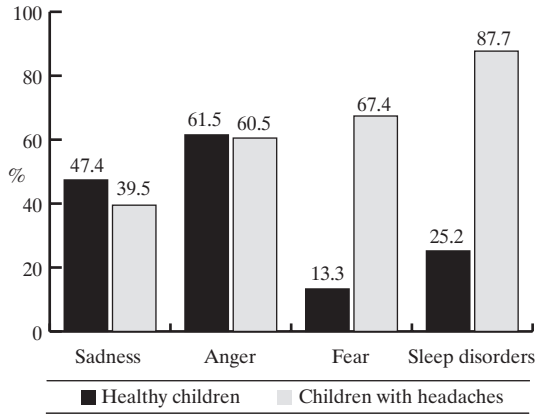
The study was conducted on 135 middle school and high school students in Poznań and on 86 children with tension headaches that were treated in the out-patient clinic of The Chair and Clinic of Development Age Neurology of Karol Marcinkowski University of Medical Sciences in Poznań. The headaches' classification was done on the basis of diagnostic criteria established in 1988 by The International Headache Society with the modification for the developmental age. The research tool for both groups was PedsQL 4.0 questionnaire [2].

The U-test was used for comparison of respective fractions (%) of examined features in healthy children and in children with headaches.

Results

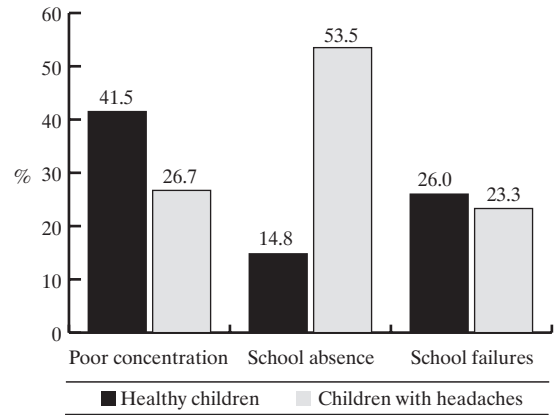
In the healthy children group the girls to boys ratio was 1.3:1. 14- and 16-year-old children prevailed. Among the children with tension headaches the girls to boys ratio was 1.5:1. Children at the age of 14 (16%), 16 (16%) and 18 (14%) dominated.

Figure 1. **Emotional functioning of healthy children and adolescents and of children and adolescents with headaches**



U-test for factions: Sadness NS, Anger NS, Fear $p<0.001$, Sleep disorders $p<0.001$

Figure 2. **Functioning of children and adolescents in school environment**



U-test for factions:
Poor concentration $p<0.05$
School absence $p<0.001$
School failures $p<0.01$

With the help of PedsQL 4.0 questionnaire four areas were analyzed: biological, emotional and social functioning, and mood. In the field of "biological functioning" healthy children presented a lot of independence and mobility. Minor difficulties were indicated when lifting something heavy – 23 children (17.0%) or running – 17 children (12.6%), 30 children (22.2%) of them experienced feeling of drowsiness. In the group of children with headaches the ailments appeared 1-3 times a day in 12 (13.9%) of children, 1-2 a week in 39 (45.3%), once a month in 9 (10.5%), and episodic problems appeared in 6 (7.0%) of the group. The adolescents described the headache above all as a sensation of tightening of a hoop around the head. 34 (39.5%) children in the group described the intensity of pain as varying. Daily feeling of pain caused in 11 (12.8%) of the group difficulties in running, and 6 (7.0%) were not able to fulfill their house chores.

Among the emotions analyzed in the area of emotional functioning (*Fig. 1*) among healthy children the feeling of anger appeared most frequently (in 83 children – 61.5%). The feeling of sadness accompanied 64 (47.4%) students, and fear 14 (13.3%) of them. In the group of children with headaches the feeling of sadness appeared in 34 (39.5%) of them, which is less frequently than in their peers, the feeling of anger appeared to almost the same extent (in 52 children – 60.5%), but they experienced the feeling of fear (58 children – 67.4%) and sleep disorders (75 children – 87.2%) more often, the latter teenagers described as not being able to fall asleep, waking up at night or having nightmares. The differences in the frequency of experiencing fear between healthy children and children with headaches were proven ($p<0.001$).

In the social area contacts with peers and school functioning were analyzed. Children from both groups showed no significant difficulty in contacts with peers. Problems with learning were confirmed by 35 (25.9%) healthy students (*Fig. 2*), including: sometimes 27 (20.0%), often 6 (4.4%), as for the students with headaches 10 (11,6%) children signalized that they sometimes have difficulties in learning, and 11 (12,8%) experience them often.

Difficulty with concentration during classes was signalized by 56 healthy students (41.5%), and by 23 (26.7%) students with headaches. In the statistical analysis with the U-test the differences in functioning of healthy children and children with headaches in the area of concentration ($p<0.05$) and failures ($p<0.01$) were shown.

In the field of mood the feelings connected to functioning in the family and the future, among others, were analyzed. The feeling of happiness accompanied 96 (71.1%) of healthy students and 51 (59.3%) of those with headaches. Satisfaction with one's own life was confirmed by 97 (71.8%) of healthy students and by 48 (55.8%) of students with headaches. The support of family was confirmed by 116 (85.9%) of healthy children and by 74 (86,0%) of children with headaches. Doubts concerning their future were expressed by 21 (15.5%) of healthy students and by 25 (29.1%) of those with headaches, however 57 (42.2%) of healthy children and 27 (31,4%) of children with headaches were convinced that only good things would happen to them. A significant difference in the feeling of satisfaction of one's life between healthy children and those with headaches was shown ($p<0.05$).

Discussion

Headaches occur in about 60-70% children younger than 15 years of age, they are more often signalized by girls and in the age group of 15-18-year-olds [1,2,3,4,5,6].

Similarly to the studies conducted by Zgorzalewicz and Budzińska [6] among teenagers with tension headaches the ailments most frequently appeared 1-2 a week. The analysis of the area of biological functioning showed a similar range of motion activities. Only in the group of children with daily headaches

did they show a significant limitation of activities, going as far as giving up their house chores. Additional problem signalized by this group and observed also by other authors was the co-existence of somatic disorders such as stomach ache, back and neck pain [7,8]. In the emotional sphere the adolescents with headaches more often felt fear and signalizes sleep disorders. In the studies conducted by Carlsson and Larsson [7] children with tension headaches woke up sleepy and thus showed less energy. Zgorzalewicz and Budzińska [6] stated sleep disorders in 97.7% of the children, and in 33.7% of children – fear of school or teacher. Children with headaches are perceived as ambitious and diligent students. This can be confirmed by the fact that both in my own studies and in Kaynak et al. [8], and Zgorzalewicz and Budzińska [6] only 1/5 of the studied group signalized difficulties in learning. The frequency of headaches has a big impact on child's school functioning. Bothersome and long-lasting headache has a negative influence on the child, reduces the ability to memorize and concentrate which leads to obtaining lower grades [9]. Powers et al. [2] noted additionally that the feeling of satisfaction from school achievements in teenagers diminishes with age.

The biggest discrepancies with the group of healthy children were affirmed apart from the emotional functioning also in the area of mood. In the conducted studies healthy children were more often accompanied by the feeling of happiness and they looked at their future in a more optimistic way. Zgorzalewicz and Budzińska [6] emphasize that 55.8% of teenagers are only satisfied with their own lives and 46.5% feel lonely.

Conclusions

1. The biggest discrepancies between a group of healthy children and those with headaches were stated in the field of emotional functioning and mood.
2. Adolescents with tension headaches more frequently reported the feeling of fear and sleep disorders in comparison to healthy students.
3. In the examined group children with headaches looked the future in a more pessimistic way and were less satisfied with their lives.

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How patients with end-stage renal disease manage their condition

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Abstract

Purpose: The main research problem is to answer the following question: What ways of coping with situations of end-stage renal disease are used by the studied patients? To measure strategies of coping with stressful situations, The Ways of Coping Questionnaire (WCQ), devised by Folkman and Lazarus, was used.

Material and methods: As examined group, the men with end-stage renal disease (N=113), including patients with a transplanted kidney (N=54) and dialyzed patients (N=59), was chosen. The analysis of these situations shows that from the psychological point of view, they are, to a certain extent, different situations. In this connection, the following question appears: Is there a relationship between the ways of coping with disease and the applied methods of treatment: dialysis therapy and transplantation?

Results: Our findings shows that there are no perceptible, statistically essential differences in the applied strategies, evaluated by means of WCQ, between patients with a transplanted kidney and the ones dialyzed. Perhaps, despite the differences presented above in this argument, situations of patients with a transplanted kidney and the ones dialyzed are similar in some significant way, and this is reflected in the strategies they adopt. One of such common features for the situations of both groups of patients is a real, continuous threat of losing life. The situations studied are uncontrollable situations that can actually be influenced by nobody.

Conclusions: The results of research have been shown the lack of statistically essential differences in the applied strategies, evaluated by means of WCQ, between patients with a transplanted kidney and the dialyzed ones.

Key words: end-stage renal disease, dialysis patients, transplanted kidney.

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Introduction

The renal replacement therapy, i.e. peritoneal dialysis, hemodialysis or transplantation, enables people with end-stage renal disease to live. At the same time, however, it becomes a source of stress for them. In Polish literature, there is not much news about psychological problems of dialyzed patients and patients with transplanted kidneys. These issues are described in more detail in English medical and psychological literature, and especially by American scientists, one example of which are the works by the team of Simmons from The Department of Sociology at The University of Minnesota in Minneapolis [1-4].

Renal disease and replacing the work of kidneys with dialyses or their transplantation, as any chronic somatic disease, is a particular case of a difficult situation which overloads the mental control system. This situation entails changes in the functioning of emotional, motivational and cognitive spheres, both in the vital and functional aspects.

The dialyzed patients have to accept the permanent procedures for hours accompanied by a lot of unpleasantness and the painful injecting of dialysis needles a couple of times a week. They are aware of the peculiar dependence of their own health, or even life, on the proper functioning of medical equipment. Going on holiday or spending time away with the families becomes unfeasible. Patients cannot even count on a short break in the contact with a dialysis center, and they do not have an influence on the course of their disease. Neither can they change their situation, nor does it become difficult to maintain a relative balance of mind. The new way of life, imposed by

treatment, causes fatigue of the unnatural situation, and, after some time, a revolt, a desire to stop the procedures, and even suicidal attempts or aggression towards the environment. The sick undergo periods of breakdowns, emotional disorders in the form of apathy, anxiety, lowered mood, despair, fear, low self-esteem. The reports by many scientists [5-11] show that dialyzed patients, while adapting to this difficult situation, apply various defense mechanisms, and the strong will to live makes them agree to such a form of treatment.

Psychological problems resulting from changes in the biological functioning of their organism occur also in patients after transplantation. These patients are aware of having to regularly take drugs, go for checkups at their transplantation clinic and strictly follow all of the doctor's recommendations. At the same time, patients after transplantation are aware of the possibility to return to dialyses in case of rejection. Needless to say, this makes them feel much safer. Dialysis therapy is treated by many patients as a transitory stage on the road to "normal", machine-less life after transplantation. Actually, all patients wish to be operated on, although they are aware of possible complications during or after the procedure. It becomes necessary to make their expectations real as far as the possibility of successful transplantation and the quality of life after the procedure are concerned [12-14].

Due to their chronic condition, patients with end-stage renal disease are in a difficult, stressful situation. In own research, theoretical foundations of the interactive conception of stress and management by Lazarus and Folkman [15,16] were used. Stress is understood as a certain relation between a person and the environment and evaluated by the individual as burdening or exceeding their capabilities. The way of coping with stress depends on the evaluation of the situation carried out by the subject. In accordance with the interactive model, both situational and subjective factors are taken into account.

The subject of the research is an attempt to define ways of coping with situations accompanying end-stage renal disease. A person in a stressful situation perceives and interprets it as a threat, challenge, or loss. Depending on this evaluation, they choose certain coping strategies. Actually, strategies are dependent on the situation and hence the situational changeability of the coping process. The stressful situation itself, i.e. dialysis therapy and transplantation, may mean that people with end-stage renal disease choose the "coping" strategy. At the same time one should remember that, in accordance with Lazarus and Folkman's theory, psychological stress is not placed in the situation itself, or the person, although it is conditioned by both. It results from the relationship of the person with the situation as perceived by the subject.

Material and methods

The main research problem is to answer the following question: What ways of coping with situations of end-stage renal disease are used by the studied patients?

As it has been mentioned before, dialysis therapy and transplantation are methods of treatment which save life of patients suffering from end-stage renal disease. The analysis of these situations shows that from the psychological point of view, they are, to a certain extent, different situations. In this connection, the following question appears: Is there a relationship between the ways of coping with disease and the applied methods of treatment – dialysis therapy and transplantation? The Ways of Coping Questionnaire (WCQ), devised by Folkman and Lazarus [17,19], was used to measure strategies of coping with stressful situations. Coping strategies are defined in this questionnaire on the basis of the studied person's opinion on 66 statements describing behavior related to a certain stressful situation. Eight scales of the questionnaire correspond with eight numerical results, on the basis of which the strategies of coping in a stressful situation used by the studied people are evaluated. The following strategies have been distinguished: confrontive coping, distancing, self-controlling, seeking social support, accepting responsibility, escape, avoidance, painful problem-solving, positive reappraisal. It should be emphasized that in accordance with Lazarus' theory, one studied person may use different ways of coping in the same situation. The questionnaire was used in Poland by the Team of The Institute of Clinical Psychology at The Medical Academy in Warsaw, and then by the Team directed by Professor Heszen-Niejodek from Silesian University [19].

Results

The examined group were men with end-stage renal disease (N=113). The patients included people with a transplanted kidney (N=54) – patients of The Transplantology Institute PSK (State Clinical Hospital) No. 1 in Warsaw, as well as dialyzed patients (N=59) – from randomly chosen Dialysis Centers, and namely: from Puławy, Warsaw, Wołomin, and Zamość. The studied men were 18 to 67 years old (X=41.04, SD=12.32). Most of them are married; among the dialyzed (N=43, 72.9%), after transplantation (N=37, 68.5%). Men with transplanted kidneys have secondary education (N=40, 74%), which is similar to the figures for the dialyzed men (N=41, 69.5%). Employment is another variable which characterizes the studied men, i.e. whether they work full- or part-time, carry out an order contract, or are unemployed. Among the patients with a transplanted kidney, over a half currently work N=29 (54%), 25 men are not employed (46.3%). Employment among dialyzed patients looks different. The overwhelming majority of men N=51 (86.4%) do not work, and only 8 of those examined are employed (13.6%), among whom 2 people work full-time, 4 people work part-time, and 2 people have an odd job carrying out order contracts. Such a large number of unemployed people among dialyzed patients is conditioned by situational factors – the complicated situation of dialysis therapy, outright being unable to reconcile the necessity of undergoing difficult, lasting a few hours procedures a couple of times a week with professional work. Also, information about the duration of a disease of the studied people was gathered. Transplantation patients live with a transplanted kidney, on average, from one year to ten years: about four years from performance of the procedure (N=54, =3.98, SD=2.66). It should be added that earlier, that is before transplantation, all patients had been subject to dialysis therapy for one to a few years. The studied dialyzed people

Table 1. **Ways of coping with end-stage renal disease situations for questionnaire WCQ with people with a transplanted kidney (group I, N=54) and dialysis patients (group II, N=59)**

	Group I		Group II			
Ways of coping	$\bar{X}$	SD	$\bar{X}$	SD	F	p
Confrontive coping	9.13	2.54	8.32	2.56	4.68	0.095
Distancing	9.26	2.67	9.44	2.71	-0.36	0.721
Self-controlling	11.29	2.51	11.85	2.05	-1.28	0.206
Seeking social support	10.20	2.87	10.88	2.34	-1.38	0.170
Accepting responsibility	6.28	2.09	5.66	2.29	1.49	0.140
Escape-avoidance	10.35	2.99	10.54	3.91	-0.29	0.773
Planful problem-solving	10.48	2.01	9.73	2.75	1.65	0.102
Positive reappraisal	12.41	3.08	11.76	3.04	1.12	0.265

had been subject to procedures for a few months to ten years. The average duration of applying dialyses among these people is over two and a half years (N=59, =2.59, SD=1.71). The groups differ as far as duration of the disease and treatment is concerned. The ways of coping with the disease applied by the studied patients were presented in *Tab. 1*.

The obtained results show a variety of applied ways of coping with the disease by the studied people. The *Tab. 1* shows that there are no perceptible, statistically essential differences in the applied strategies, evaluated by means of WCQ, between patients with a transplanted kidney and the ones dialyzed. Perhaps, despite the differences presented above in this argument, situations of patients with a transplanted kidney and the ones dialyzed are similar in some significant way, and this is reflected in the strategies they adopt. One of such common features for the situations of both groups of patients is a real, continuous threat of losing life. The situations studied are uncontrollable situations that can actually be influenced by nobody.

Discussion

In order to observe the situational conditioning of the ways of coping with the disease, the results of patients with a transplanted kidney were compared with the results of dialyzed patients (see *Tab. 1*). On the basis of the results obtained, it turned out that the situation of hemodialysis and transplantation does not significantly differentiate the ways of coping with the disease applied by the studied patients. A supposition emerges that there may be more similarities than differences in these situations, despite the clear medical division. A statement about uncontrollability of these situations seems justified. Both dialysis therapy and transplantation are unforeseeable – a patient does not know at all what to do to feel well during hemodialysis, or when their organism rejects the transplanted kidney, despite the information about these ways of treatment that they have. They are also unmodifiable situations, because in spite of applying various strategies in order to cope with the problems patients do not achieve desirable results, and the awareness of a threat of their lives is still present.

Research made on the ways of coping with the disease used by people with end-stage renal disease makes it possible to formulate some conclusions.

First of all, the interactive conception of stress by Lazarus and Folkman is a theoretical formulation which allows making research on psychological problems of the sick. In order to construct this research, it is essential to distinguish three notions: style, strategy and process of coping with the disease. The research presented concerns remedial strategies used by chronically ill patients. The results obtained show that patients undergoing hemodialysis and the ones after transplantation of a kidney use various strategies of coping with the disease. Small situational differences occurred in coping strategies, which may indicate methodological difficulties, as the technique applied might not have observed these differences to a proper extent. Attempts should be made to develop new techniques to study coping strategies for those groups of patients. The interactive theory of stress and coping shows it is necessary to examine three categories: strategy, style and process. Undoubtedly, the strategies used by the patients under examination are influenced by properties of a situation, but also the style, and hence the need to also study this individual disposition determining human behavior in stressful conditions. It should be emphasized that human behavior in a difficult situation is conditioned by the situation, but first of all by subjective evaluation of this situation. Other variables appear, such as: the ill person's own image of the disease, personality factors, social circumstances, which may make it difficult to empirically verify the coping strategies used by people.

Secondly, basing on the research made, remarks that could be applied in practice can be listed too. A human is a psychosomatic whole, and hence the necessity to get to know the situation and subjective conditioning which are important when choosing certain coping strategies. The disease situations studied are uncontrollable situations, which virtually cannot be influenced by anyone. A remark about decreasing the subjective feeling of uncontrollability of the disease situation emerges here. It becomes important to properly inform patients and their families and to present the areas of life where they can be active even when the disease represents a threat of life, as is the case with end-stage renal disease. In Poland, more and more people are treated with hemodialysis and kidney transplantation. Awareness of the society of the role of these methods of treatment is increasing as well. It is then necessary to continue research aiming to help rehabilitate people with end-stage renal disease.

Conclusions

In this paper the ways of coping with situations of end-stage renal disease used by the dialyzed and transplanted patients have been described by means of Folkman's and Lazarus's WCQ. The results of research have been shown the lack of statistically essential differences in the applied strategies, evaluated by means of WCQ, between patients with a transplanted kidney and the dialyzed ones. This conclusion can be followed from uncontrollable situations, which virtually cannot be influenced by anyone.

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Quality of life after surgical treatment of thyroid gland diseases

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Abstract

Purpose: The aim of the work is to rate different factors specifying quality of life after surgical treatment of thyroid gland diseases.

Material and methods: Research was carried out on 93 people with recognition of nodular goitre treated surgically during the period 2000-2003 in 2nd Department of General and Oncological Surgery in Wrocław. 83 women and 10 men aged approximately 48 took part in the research. The research was carried out with a help of analysis of medical documentation as well as QL questionnaire including 25 features (clinical, emotional, social).

The results of the QL research were prepared on the basis of "SyntMed" Computer Medical Diagnostics programme (Krefft method). Every patient was given a certain QL quantity in the 0-1 range together with the importance of diagnostic features, indicating the strength of influence of the feature on QL quantity.

Results: The strongest influence on QL index had the following diagnostic features: subjective opinion of the quality of life (0.674), sensation of fear in connection with the health condition (0.631), physical efficiency (0.565). Among clinical features the strongest influence had a feeling of palpitation (0.405).

It was certified that together with the extension of the post-operation period medium value of QL index increases.

The most frequent clinical problems mentioned by the tested patients were: sleeping disorder (66.6%), nervousness (37.6%), sweating (36.5%), palpitation (24.7%).

36.6% of the tested patients are afraid of a setback and 77.4 % of them are worried about their health condition. The treatment did not have an influence on planning the future, sexuality and social life. 59.1 % of the tested patients defined their present health condition as satisfactory.

Key words: quality of life, thyroid gland, surgical treatment.

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Introduction

Thyroid gland diseases apart from local symptoms are characterised by the possibility of occurring many general symptoms concerning state of nervous and psychical excitability, emotional instability, heart action disorder, weakening of skeletal muscles and skin changes.

In most cases the symptoms are nagging, leading to discomfort in personal, professional and social life of a patient. Because the majority of the patients are people in the 30-50 age range which is a group of significant life activity expected it seems essential to introduce research on the quality of life of those patients.

Material and methods

The research was carried out on 93 people with recognition of nodular goitre treated surgically during the period 2000-2002 in 2nd Department of General and Oncological Surgery in Wrocław.

83 women and 10 men in the 23 to 78 age bracket took part in the research. Average age was 48. Approximate period of time from symptoms of the disease to surgical treatment was 3 years.

It was notified that in the majority of the patients postoperative course had not been complicated, 5 people had experienced

longer period of wound healing, 2 people – change of timbre. All patients were operated in euthyreosis.

50 of the tested patients (54%) were within two years after the operation, 43 people (46%) – over two years.

For the purpose of the research the following were used:

- analysis of medical documentation describing clinical condition of the patient
- QL questionnaire of the quality of life consisting of two general groups of questions.

The first were general questions connected to a description of the tested patients: age, sex, place of living, source of income. The second group of questions was connected directly with estimating the quality of life.

The questionnaire was filled in by the patients in person.

The following parameters were distinguished and divided into groups, which describe the quality of life subjectively by the patient himself.

- Clinical symptoms (sleeping disorder, palpitation, sweating, nervousness) – feature x6÷x13.
- Emotional state (reaction on the disease and treatment) – feature x14÷x18.
- Physical efficiency (level of competence and efficiency defined by the mode of life lead) – feature x19÷x21.
- Sex life – feature x22.
- Subjective opinion of general feeling and global quality of life (need of planning the future, sensation of happiness) – feature x23÷x28.
- Social background (social contacts, family life) – feature x29÷x30.

The results of the research with a help of QL questionnaire of the quality of life were prepared on the basis of the Krefft mathematical method (SYNTMED computer programme).

Krefft mathematical method

Using Krefft method for analysing quality of life gives a great opportunity of transferring descriptive features into mathematical language: subjective opinion of suffering, physical efficiency, feeling of fear, self-esteem, psychical state of happiness.

It gives an opportunity of creating QL index of the quality of life as a single parameter describing a patient, which is based on information gathered from the research of diagnostic features. Thank to the method we get constant 0-1 quantities of the diagnostic function describing the importance of diagnostic features. In other words they are numbers expressing dynamics of the influence of certain features on Z function.

The method is a mathematical algorithm leading to the formula of synthesis function describing tested thing with a help of the function quantities on the basis of empiric base by using a computer technique.

The synthesis function defined for the features by Krefft method algorithm generally can be written down as follows:

$$Z=\varphi(X_1,X_2,\ldots\ldots Xk)$$

where $X_1,X_2,\ldots\ldots Xk$ – certain diagnostic features
k – number of diagnostic features
Z – index of the quality of life
φ – variable function symbol X
Z – QL variable is a function of many variables (diagnostic features) and the quantity of the function vary within 0-1 range what helps in placing patients in order of the Z quantity, in other words – the quality of life. The higher quantity of the QL variable the better is the quality of the patient's life.

The results of the diagnostic features research and information of so called "directions of the influence" of the given features were basic information for the purpose of using Synt-Med computer programme. 25 diagnostic features describing subjective opinion of the quality of life patients after surgical treatment of thyroid gland diseases were introduced, numbered X6 to X30. The final result was a variable called QL index of the quality of life.

Every feature is ordered from the best to the worse situation of the quality of the patient's life. Data gives information about "directions of the influence" of the given diagnostic features in relation to the discussed quality of life. Information expresses "minus" direction (–) if a given feature is increasing together with the decrease of the quality of life and "plus" direction (+) if a given feature is increasing together with the increase of the quality of life. All the tested diagnostic features had minus direction of the influence.

χ^2 (chi square) test was used for the purpose of defining the importance of differences in frequency of qualitative features. It was used for parallel tests with Yotes' correction for four-fold tables.

Results

Medium quantity of QL index for the tested group using Krefft method was x0.51±14.

Having analysed medium value of QL index it was notified that it decreased with the age of the tested patients. And therefore the highest medium value of QL was found in the up-to-30 age group (x0.56±15), in the 31-40 age bracket (x0.54±12), QL index (x0.51±16) in the 51-60 age range. The lowest QL value was found in the over-61 age group (x0.46±12).

Value of QL index was analysed on 10 men and 83 women. The higher medium value of the index was found among women (x0.51±19), it was (x0.46±21) for men.

It was notified that the medium value of QL is higher among inhabitants of the town (x=0.52), compared to the inhabitants of the village (x0.43±21). As far as the education of the tested patients was concerned, the results were the following: 15 people had higher education, 42 people secondary education and 36 – primary. Having analysed statistically important value of QL it was notified that it increased with the level of education.

Medium value of QL among people with primary education was 0.36±17, with secondary education – 0.56±16, and with higher education – x=0.72±12.

The tested patients with post-operative period longer than 2 years (43 people) had higher medium QL index (0.54±22) compared to those with a shorter post-operative period (50 people) QL=x=0.47±18.

Analysis of the importance of diagnostic features calculated by Krefft method.

The influence of the diagnostic features on the quantity of

Table 1. **The Importance of Diagnostic Features**

No.	Quantity of feature	No. of feature	Description of Diagnostic Feature	Level of importance
1.	0.674	X27	Subjective opinion of the quality of life	P<0.05
2.	0.631	X18	Sensation of fear in connection with health condition	P<0.05
3.	0.565	X19	Physical efficiency	P<0.05
4.	0.534	X26	Subjective opinion of health	P<0.05
5.	0.521	X20	Mode of life (activity)	P<0.05
6.	0.501	X14	Fear of setback	P<0.05
7.	0.500	X15	Subjective sensation of fear level	P<0.05
8.	0.499	X24	Sensation of happiness	P<0.05
9.	0.494	X21	Way of spending free time	P<0.05
10.	0.461	X23	Aims for future	P<0.05
11.	0.424	X22	Sexual life	P<0.05
12.	0.405	X12	Feeling of palpitation	P<0.05
13.	0.388	X17	Influence of surgical treatment on quality of life	P<0.05
14.	0.384	X6	Cough	P<0.05
15.	0.353	X29	Social life	P<0.05
16.	0.352	X28	Satisfaction from undergoing operation	P<0.05
17.	0.347	X13	Sleeping disorder	P<0.05
18.	0.318	X11	Nervousness	P<0.05
19.	0.308	X9	Hoarseness	P<0.05
20.	0.280	X16	Postoperative scar as aesthetic defect	P<0.05
21.	0.269	X8	Easy tiredness	P<0.05
22.	0.262	X7	Enlargement of neck circumference	P<0.05
23.	0.226	X10	Sweating	P<0.05
24.	0.184	X30	Expectation of family support	Nstat
25.	0.116	X25	Influence of surgical treatment on planning future	Nstat

Table 2. **The Importance of Diagnostic Features – clinical features**

No.	Quantity of feature	No. of feature	Description of Diagnostic Feature	Level of importance
1.	0.727	X13	Sleeping disorder	P<0.05
2.	0.571	X11	Nervousness	P<0.05
3.	0.470	X12	Palpitation	P<0.05
4.	0.445	X10	Sweating	P<0.05
5.	0.415	X9	Hoarseness	P<0.05
6.	0.414	X6	Cough	P<0.05
7.	0.401	X7	Enlargement of neck circumference	P<0.05
8.	0.299	X8	Easy tiredness	P<0.05

QL index was estimated with a help of QL questionnaire and Krefft mathematic method. From 25 tested diagnostic features 23 were considered as statistically important on the QL quantity (*Tab. 1*).

Feature x27 describing subjective opinion of the quality of life was the most important in diagnostics. Feature x18 was the second – "sensation of fear in connection with health condition" (x18= 0.631).

The third and the fourth were the following features: x19 – "physical efficiency" with the quantity 0.565 and feature x26 – "subjective opinion of health" with the quantity 0.534.

It is worth mentioning that the first 10 are features which do not describe clinical condition of the tested patients.

The most important clinical feature in the chart was (x12=0.405) "feeling of palpitation", placed as 12th. It is essential to emphasize the quantity of diagnostic features describing clinical condition: feature "cough", "sleeping disorder" and "nervousness" placed as 14th, 17th and 18th with the quantity X6=0.384, X13=0.347, X11=0.318.

Two of the tested features had irrelevant statistically influence on the QL index of quality of life. One of them – "expectation of family support" X30=184 and "influence of surgical treatment on planning future" X25=0.116.

The most frequent clinical symptoms among tested ones are: nervousness – given by 37.6% of the tested patients, sweating – 36.5%, feeling of palpitation – 24.7%, easy tiredness – 26.9%, cough – 20.5%. Regular sleeping disorder is notified by 11.8% of the tested patients and periodic one by 54.8%.

A significant group of the tested patients – 34 people (36.6%) are worried of a setback. 19.3% of the tested patients define their fear as strong, 31.1% as moderate.

A separate analysis of the importance of diagnostic features describing clinical condition was also made – feature x6÷x13 (*Tab. 2*).

The most important feature among the tested diagnostic features describing clinical condition was number 13, sleeping disorder X13=0.727. Nervousness and feeling of palpitation were 2 and 3 with the quantity X11=0.571, X12=0.470.

The most irrelevant diagnostic feature among the clinical ones was X8 "easy tiredness" with the quantity X8=0.299.

Discussion

Wide understanding of the expression „quality of life" including various areas of human life is used in medicine for rating biological, psychical and social factors together with their relations. Decreasing of physical efficiency, disorders in emotional sphere and social life are thought to be very important consequences of surgical treatment and therefore many researchers are trying to define the influence of the disease and ways of treatment on the patients' quality of life.

There are many definitions of quality of life in the medical literature. Very often the expression is used as replaceable for defining health condition, feeling of health, life satisfaction, psychical state of happiness [2]. There are two, though, main definitions common for many researchers regarding the way of understanding the expression "quality of life":

1. Quality of life is a subjective conception;
2. Quality of life is a multidimensional conception [3,1].

The starting point to the research of quality of life patients after surgical treatment of thyroid gland diseases is defining QL quality of life and components used for defining quality of life of those patients.

The following definition of quality of life were used: "Quality of life is an opinion about life position of a patient and it is a global concept of physical, psychical and social aspects of well-being and negative effects of a disease and feeling unwell" [5].

According to advice of many experts, an index of importance was introduced to describe the results. In other words, index describing the importance of a given element of the research in a hierarchy [7]. The group of the tested patients is a small part of a vast number of patients with thyroid gland diseases treated surgically (in Poland approx. 10 000 annually).

No records have been found of a research on the quality of life of those patients. Despite significant progress in preventive therapy of thyroid gland diseases surgical treatment is still commonly recognised and used way of treatment [6,7], so the number of people surgically treated is going to be considerable.

It seems to be essential to carry on research on quality of life of those patients. According to the results the following diagnostic features had the strongest influence on QL index: subjective opinion of the quality of life, sensation of fear in connection with health condition, physical efficiency, feeling of palpitation.

The most frequent clinical problems mentioned by the tested patients were: sleeping disorder (66.6%), nervousness (37.6%), sweating (36.5%), feeling of palpitation (24.7%). A significant number of the tested patients (36.6%) is afraid of a setback. Majority of the tested patients (66.6%) seems to experience neither deterioration nor improvement of the quality of life in subjective opinion of the quality of life.

Very interesting is subjective opinion about the sensation of fear in connection with health condition. Majority of the tested patients (77.4%) declares a sensation of fear with various intensification. It leads to a conclusion that patients after surgical treatment of thyroid gland will require long medical as well as psychological care.

Conclusions

1. The most important diagnostic features in rating quality of life had: "subjective opinion of the quality of life", "sensation of fear in connection with health condition", "opinion about physical efficiency".
2. The most important diagnostic feature among clinical features had: "feeling of palpitation".
3. Together with the extension of the post-operation period medium value of QL index increased.
4. The most frequent clinical problems of the tested patients are: sleeping disorder, nervousness, sweating.
5. A large number of the tested patients is worried of a setback.
6. There is a need of farther and more complex research on quality of life after surgical treatment of thyroid gland diseases.

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Helicobacter pylori eradication as prevention against chronic peptic ulcer disease in children

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Abstract

The changes caused by Helicobacter pylori are a slow, progressing inflammatory process developing from several to dozen years. H. pylori infection leads to an inflammatory response in the gastric mucosa with granulocyte infiltrates in an acute form of the inflammation, and lymphocytes, plasmatic, macrophages and eosinophils in a chronic form inducing the development of gastric and duodenal ulcers and gastric cancer in some patients.

The frequency and the type of morphological changes in the gastric mucosa were analyzed in children with positive IgG against H. pylori and the incidence of gastric and duodenal ulcers in family members of children examined was evaluated in our study. Gastritis was reported in 68.8% of children with positive IgG against H. pylori. Gastric ulcer was confirmed in 37.1% of families of children included in the study. Duodenal ulcers were found in 22.9% of families. The results obtained, indicate the usefulness of long-term observation and clinical follow-up of children with chronic gastritis of H. pylori ethiology taking into consideration bacterium eradication as prophylaxis of peptic ulceration.

Key words: Helicobacter pylori, prevention, children.

Introduction

Many authors suggest that past H. pylori infection in children is a very common phenomenon in early childhood. It has not been explained whether it is closely connected with a socio-economic factor or others, as for example, a host's immune response to the infection, which differs greatly from an adult's immune response. At the beginning, the infection develops without symptoms or subclinically, regardless the role of H. pylori in the pathology of the stomach. After about 2-4 weeks of an acute phase, the infection retreats from the corpus and develops into chronic infection located in the region of the pylorus with a normal clinical picture or mild gastritis within the corpus. In other patients, multifocal and atrophic inflammation develops affecting the corpus and the region of the pylorus. Bacteria are spontaneously eliminated in few patients. The development of an acute phase into a chronic process may result from host's ineffective defense mechanisms or numerous enzymes and cytotoxins produced by H. pylori [1-5]. In the examinations carried out in adults, it was proved that some strains of H. pylori producing VacA and CagA might induce the development of peptic ulcers or stomach cancer. Though more than 50% of H. pylori strains are virulent, this serious condition affects only minority of adults infected with these strains. There are few data concerning the influence of these virulence factors in children. The studies of H. pylori infection performed in the North America have not confirmed the relation between probable virulence factors-VacA and CagA and the onset of peptic ulcer disease. The strains possessing CagA gene were found in 75% of children with ulceration and 60% of children with gastritis histologically confirmed. The assessment of IgG immunoglobulin in the serum of children seemed to correlate with the stage of gastritis [9]. Inflammatory changes in gastric mucosa caused by H. pylori may persist from several to dozen years giving neutrophil infiltrates in the acute phase of the inflammation, and infiltrates of lymphoplasmatic cells, macrophages and eosinophils in the chronic phase. The size of leukocytic infiltrate correlates with the degree of colonization and damage to the mucosa. A low number of B lymphocytes are observed in the inflammatory infiltrate. Fewer $CD8^+$ lymphocytes contribute to the development of the inflammatory process in comparison with $CD4^+$ supporting lymphocytes [10]. The purpose of the

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Figure 1. **Age characteristics of children depending on dwelling place**

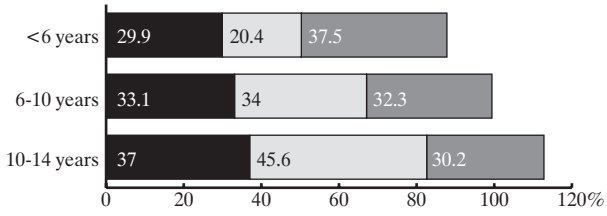


Figure 2. **Age characteristics of children with IgG titre evaluation against H. pylori**

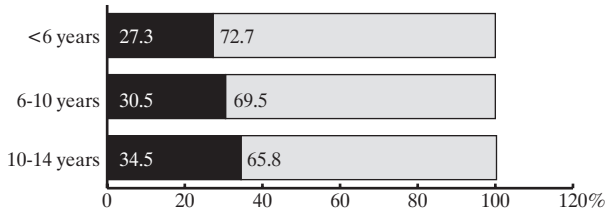
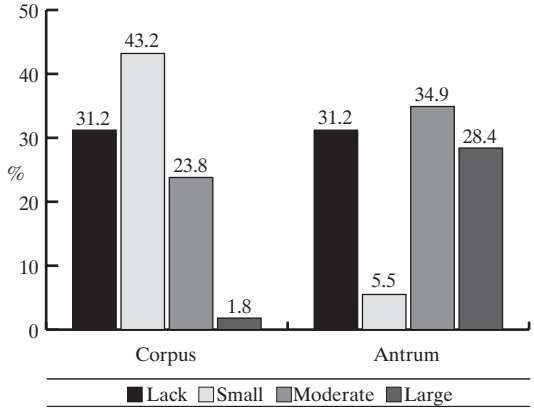


Figure 3. **Gastric corpus and antrum mucous membrane inflammation in children examined**



study was to assess the frequency and the type of morphological changes in gastric mucosa of children with positive IgG against Helicobacter pylori and the incidence of gastric and duodenal ulcer disease in family members of children examined.

Material and methods

The study included 595 children up to the age of 14 years, who underwent questionnaire examination in the national epidemiological program of Helicobacter pylori infection of The Ministry of Health and The Committee of Scientific Research N° 1-43016. A number of 176 children up to 6 years constituted 29.5% of the group; 197 children aged from 6 to 10 years – 33.2%; 222 children aged from 10 to 14 years – 37.3%. *Fig. 1* presents the structure of the group examined with regard to the place of living. Taking into consideration the gender, the group consisted of 295 boys (49.6%) and 300 girls (50.4%). The questionnaire examination performed in children up to 14 years and the assay of IgG level against H. pylori (blood samples, 2 ml each, were taken twice for clot) were aimed at evaluating the prevalence of this bacteria infection in the population randomly chosen in the region of North-Eastern Poland at the level of local district, country and provincial city. The questionnaire study, apart from the diseases of the gastrointestinal tract in children examined, referred to the incidence of gastric and duodenal ulcer disease in their family members and was to find a relation between the diseases mentioned above and H. pylori infection in the families examined. IgG antibodies against H. pylori were identified in the blood serum or plasma with a kit of "recom Well helicobacter IgG" of Mikrogen GmbH firm. The concentration of antibodies >24 U/ml was considered as positive. All children with a positive titre of IgG against H. pylori and accompanying peptic symptoms underwent gastroscopy after obtaining parents' written consent. Gastroscopic and histopathological evaluation of the antral and corpus mucosa was carried out according to The Sydney System assessing the infection severity, the stage and activity of gastritis. All children were given a quick urease test to detect H. pylori in the stomach bioptates using the kits produced and distributed by The Institute of Food and Nutrition in Warsaw. The correlation between non-measurable features was assessed by a independence test χ^2. The correlation was regarded statistically significant at $p<0.05$, whereas the correlation at the border of significance at $0.05 \leq p < 0.1$. Arithmetic means and standard deviations were used to present the mean IgG level.

Results

A positive result of serum IgG against H. pylori was found in 184 children aged up to 14 years (30.9%). In children up to 6 years, a positive result was determined in 48 children examined; in the group of 6-10 years – 60 children; in the age of 10-14 years – 76 children, which in particular groups constituted 27.3%, 30.5% and 34.5%, respectively, of all children included in the study *Fig. 2*. In children with a positive titre of IgG and clinical symptoms (109 children), gastroscopy showed that 34 children (31.2%) had no H. pylori infection in the corpus and antral mucosa. In other children, gastritis was differentiated in the antrum and corpus. Mild gastritis predominated in the corpus mucosa and was observed in 47 children (43.2%). In the antrum, moderate gastritis was found in 38 examined (34.9%) and severe in 31 children (28.4%). Mild gastritis was diagnosed in the antrum of 6 children (5.5%) (*Fig. 3*). The activity of gastritis measured by the amount of infiltrating granulocytes was higher in the antral than corpus mucosa. Chronic peptic ulcer disease was reported in 221 families of children included in the questionnaire study, which constituted 37.1% of the population examined. The lowest percentage of peptic ulcer disease was found in families of up to 6-year-old children (61 children – 34.6% and the highest

Table 1. **Gastric ulcer family history of examined children considering children's age**

Gastric ulcer in family history	Age of children							
	< 6 years		6-10 years		10-14 years		Total	
	N	%	N	%	N	%	N	%
Yes	61	34.6	74	37.6	86	38.7	221	37.1
No	115	65.4	123	62.4	136	61.3	374	62.9
Total	176	100.0	197	100.0	222	100.0	595	100.0

Significance evaluation p=0.6969; NS

Table 2. **Duodenal ulcer in family history of children considering children's age**

Duodenal ulcer in family history	Age of children							
	< 6 years		6-10 years		10-14 years		Total	
	N	%	N	%	N	%	N	%
Yes	39	22.1	46	23.4	51	23.0	136	22.9
No	137	77.9	151	76.6	171	77.0	459	77.1
Total	176	100.0	197	100.0	222	100.0	595	100.0

Significance evaluation: p=0.9662; NS

– in the families of 10-14-year-old children (86 children – 38.7%) – *Tab. 1*. Duodenal ulcer disease was reported in 136 families of children examined. Its percentage was lower when compared to gastric ulcer and equaled 22.9%. The highest percentage of duodenal ulcer was found in families of 10-14 year-old children and referred to 51 children (23%) – *Tab. 2*.

Discussion

Gastritis is a response to the infection. The severity of an inflammatory state and its consequences depend on the virulence of the strains, colonization density and an immune response. In children with a positive IgG, gastritis was observed in 68.8% of the examined and was differentiated in the antrum and corpus. Mild gastritis predominated in the corpus mucosa and developed in 47 children (43.2%). Moderate gastritis was prevalent in 38 children (34.95) and severe gastritis in 31 children (28.4%). All phenomena mentioned above, such as a damage to the protective mucous layer and epithelial cells caused by toxic agents and an inflammatory state persisting for years as well as the enhanced level of hydrochloric acid may lead to peptic ulcer disease. The discovery of H. pylori has contributed immensely to the understanding of the pathology of gastric and duodenal mucosa diseases. Gastric and duodenal ulcers in children are considered as primary in their development without any other systemic diseases. A positive family history of peptic ulcers is common in a clinical picture in this group of patients. The results of numerous examinations prove that gastritis is caused by H. pylori [11,12]. The next proof of the familiar character of gastritis and peptic ulcers in children is the grouping of H. pylori cases among the family members [13]. El-Omar et al. provided further molecular proofs of stomach cancer running in the family connected with H. pylori infection. The authors proved that the grouping of a gene coding the production of interleukin-1 was found in family cohorts with an increased risk of gastric mucosa atrophy, intestinal metaplasia induced by H. pylori and gastric cancer [8]. The group of children infected with H. pylori with atrophic gastritis and intestinal metaplasia described by Guarner enabled to connect H. pylori infection with their incidence in families and similar hereditary patterns of disease determinants [14]. The incidence of gastric ulcers equaled 37.1% and duodenal ulcer – 22.9% of the families questioned. The highest percentage of gastric and duodenal ulceration was observed in the group of 10-14 year-old children and was 38.7% and 23.0%, respectively. No statistically significant difference between gastric and duodenal incidence was found in the families of age groups. The indices of peptic ulcer incidence in childhood are low. Pediatric centers of endoscopic examinations occasionally report about the morbidity of 5-7 children with gastric and duodenal ulcers per year. Gold et al. proved that ulcers were present in 0.4% of all patients hospitalized. Male black and Latino teenage patients predominated in this group. Though the risk of peptic ulcer and gastric ulcer is connected with H. pylori-related gastritis, there are no randomized clinical control trials, which would prove that H. pylori eradication prevents ulcer development [15]. In children, H. pylori-related duodenal ulceration and gastritis and gastric metaplasia in the stomach are closely related to each other. It has been suggested that after the initial infection, gastritis develops followed by the gastric metaplasia of the mucosa in the duodenum and then the colonization of gastric metaplastic tissue foci with H. pylori and duodenal ulceration [12]. The results of Drumm's et al. studies showed that H. pylori-dependent gastritis was found in 90% of children with duodenal ulcer. An acute inflammatory state of the pyloric mucosa is closely related to the increased incidence of duodenal ulceration in all age groups. Similarly to adults, the development of duodenal ulceration rarely occurs in children without H. pylori infection. However, ulcers are more and more reported in children without H. pylori infection. These observations may result from many factors, among the others, a false negative histopathologic test due to the accidental missing of microorganisms while taking the sample with the low density of colonization, or the colonization of the proximal regions of the gastric mucosa caused by proton pump inhibitors or antibacterial medications. It has been proved that there is no recurrence of duodenal disease in children after H. pylori eradication. Yeung et al. presented 23 children with H. pylori-related gastritis with duodenal ulcers treated with Cymetydyn or combination of Cymetydyn and Amoxycycline [16]. In 6 children with H. pylori eradicated, no recurrence of duodenal ulcer was observed during 6 months after treatment. In contrast, in 50% of patients with cured ulceration, but with H. pylori infection (treated exclusively with Cymetydyn), ulcer disease recurred within 6 months. It was proved that after eradication healing duodenal ulcers were more frequently covered with gastric than intestinal epithelium. In our study, the percentage of the incidence of gastric and duodenal ulcers in the families of children examined

is high and suggests further monitoring of the infection as well as the examination of H. pylori infection in the family, taking into consideration genotype studies and an immuno-morphological response of the gastric mucosa.

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The integrated and interdisciplinary treatment of chronic lymphedema

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Abstract

Lymphedema is a chronic and incurable disease, deeply disturbing physical and psychical health of affected individuals. Lymphedema is a progressive, if left untreated.

Affected patients are looking for help between physicians and therapists of different specialities. Chronic lymphedema leads to emotional disorders, depression, even to suicidal attempts – especially in young patients. In rare cases it may lead to lymphangiosarcoma – ominous neoplasm with poor prognosis.

Complex interdisciplinary approach of the lymphedema team is the key to the success of lymphedema therapy. Optimal treatment of lymphedema requires close cooperation of all people involved in the therapeutic process including physicians, nurses, physiotherapists and psychologists. International Society of Lymphology (ISL) published its recommendations for lymphedema therapy, which are accepted in many countries around the world. Recommended by ISL physiotherapy consists of a manual lymphatic drainage, compressive bandaging, decongestive exercises and meticulous skin care. It is called a manual lymphedema treatment – complex physical therapy (MLT-CPT).

Key words: chronic lymphedema, therapy.

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A subject of chronic lymphedema is frequently omitted or placed on the margins of chapters devoted to cardiovascular disorders in medical textbooks. Its etiology is frequently insufficiently explained as a simple imbalance between capillary filtration, reabsorbtion and lymphatic drainage. Misunderstanding of the patomechanism of lymphedema and underscoring of significance of the problem of chronic extremity lymphedema are common between primary care physicians and specialists in oncology or cardiology.

Lymphedema is usually not a life threatening disorder and frequently regarded as price for life salvage in cancer survivors. Such a view probably resulted in relative lack of interest in clinical and basic research devoted to disorders of lymphatic systems. Fortunately nowadays one can notice significant change in this matter.

Lymphedema is a chronic and incurable disease, deeply disturbing physical and psychical health of affected individuals [1]. Lymphedema is a progressive, if left untreated [2].

Lymphedema is a global problem. Number of people affected with lymphedema is estimated on 140 millions around the world [3]. The real number is probably higher due to insufficient diagnosis of lymphedema. Lymphedema is in many countries, including Poland, underdiagnosed and treated due to insufficient number of properly trained physicians. We do not have also statistical data on prevalence and icidence of lymphedema in Poland. Professor Waldemar Olszewski, a world renown expert in lymphology estimates anywhere between ten and twenty thousands people with lymphedema in Poland [4]. In neighboring Germany the estimates are around 120 000, including 40 000 with primary lymphedema and 80 000 with secondary lymphedema. The most common causes of secondary lymphedema in developed countries are cancer therapy (surgery and radiation, other iatrogenic and noniatrogenic injuries, infections and metastatic cancer [5].

Lymphedema is frequently classified according to its etiology into primary and secondary lymphedema [1]. Primary lymphedema can be further divided into: congenital lymphedema – present at birth, caused by congenital abnormalities

of lymphatic vessels (e.g. aplasia, hypoplasia, megalymphatics, chylous reflux); lymphedema precox – which appears at puberty, rarely occurring as familiar disorder (Meige's disease); lymphedema tarda – that appears after age of 35.

Primary lymphedema usually affects lower limbs (94%), upper extremities (3%), genitals (3%), head (0.5%). Secondary lymphedema is usually diagnosed in upper extremities – postmastectomy lymphedema (66%), lower extremities (31%), genitals (1.5%), head (1%) and breasts (0.5%) [5].

Causes of secondary lymphedema include: surgical lymphadenectomy, injury of lymphatics vessels (mechanical or caused by radiation), bacterial and parasitic infections, lymphatic obstruction (external compression by tumor, fibrosis).

Insufficient lymphatic drainage with initially normal capillary filtration is a primary defect in lymphedema. In other types of extremity edema (venous, cardiac, nephritic) capillary filtration is increased. Lymph stasis may result not only from anatomical defects of lymphatics (aplasia, hypoplasia, megalymphatics), but also may be caused by impaired lymphatic contractility. In chronic lymphedema, regardless its etiology, we observe impaired lymphatic drainage and hypertrophy of skin and connective and fatty tissue in the subcutis [6]. Chronic lymphedema causes secondary musculo-skeletal disorders with impaired limb mobility and strength, recurrent infections (cellulitis) requiring antibiotics and frequently hospitalization, leading to permanent disability.

Affected patients are looking for help between physicians and therapists of different specialities. Chronic lymphedema leads to emotional disorders, depression, even to suicidal attempts – especially in young patients. In rare cases it may lead to lymphangiosarcoma – ominous neoplasm with poor prognosis [7].

Optimal treatment of lymphedema requires close cooperation of all people involved in the therapeutic process including physicians, nurses, physiotherapists and psychologists [2].

Physicians are responsible for the diagnosis of lymphedema, therapeutic plan and supervision of physiotherapy. Pharmacoterapy has only a supplementary role in therapy of lymphedema. Lymphotropic drugs include flavonoids, which were shown to increase lymphatic contractility, decrease capillary permeability and inhibit inflammatory reactions. Diuretics are not recommended, due to its non physiological action and quick rebound of edema.

Surgical therapy is recommended only in a subset of patients with severe lymphedema and no improvement after conventional physiotherapy. For patients with severe lymphedema (elephanthiasis) various modifications of 'debulking' surgery were described [8]. Microsurgical reconstruction of lymphatic drainage, introduced by professor Waldemar Olszewski, can be used in limited cases where afferent lymphatic trunks are functional. Microsurgery can be used separately or in conjunction with 'debulking' surgery. Unfortunately lymphatic anastomoses are relatively short living and many surgeons reported occlusion of majority of lymphatic anastomoses within one year after surgery. It is necessary to use compression garments after the surgery to improve lymphatic outflow and prevent recurrence of lymphedema [9].

Meticulous skin care is indispensable, and should be taught and supervised by the team nurse. Proper skin care is essential in prevention of skin infections. Trained nurses can also apply compressive dressings.

Psychologist is an important member of the lymphedema team. Patients with chronic lymphedema are known to suffer from multiple psychological problems ranging from low-self-esteem, to sexual disorders and depression. Quality of life of cancer survivors with lymphedema is much lower that quality of life of breast cancer survivors without this problem [2].

Physiotherapist is the crucial element of the therapeutic team. Physiotherapy was shown to be very effective and safe in chronic lymphedema. Relative simplicity and cost-effectiveness makes physiotherapy the most common therapy for both secondary and primary lymphedema. Physiotherapy is regarded by some authors to be the most effective therapeutic approach for patients with lymphedema [10]. In the polish literature [11] recommended physical therapy for patients lymphedema includes: classic manual massage, pneumatic massage, water massage, whirlpool therapy, breathing exercises, decongestive exercises, limb elevation and electrical stimulation. Compressive garments are also recommended. A value of intermittent pneumatic compression is pointed out [12].

International Society of Lymphology (ISL) published its recommendations for lymphedema therapy [13], which are accepted in many countries around the world. Recommended by ISL physiotherapy consists of a manual lymphatic drainage, compressive bandaging, decongestive exercises and meticulous skin care. It is called a manual lymphedema treatment – complex physical therapy (MLT-CPT). Manual lymphatic drainage (MLD) is a gentle manual technique (very different from a classic massage) in which by means of delicate skin touching and finger movements lymphatic drainage is stimulated, regional lymph stasis is alleviated, and lymphatic regeneration is accelerated. Manual lymphatic drainage was first mentioned by Alexander von Winiwarter over 100 years ago. In 1932 Emil Vodder developed his own technique of manual lymphatic drainage and presented it in 1936 at The International Health and Beauty Exhibition in Paris [14]. Special maneuvers of MLD are applied along lymph drainage pathways. MLD is performed in a specific sequence, starting from supraclavicular areas bilaterally, and then following distally. Slight increase of local tissue pressure during MLD helps filling initial lymphatics. Gentle tissue pulling activates contractions of lymphatic trunks. Lymphatic system activation is helped by stimulation of vagal nerve during long and gentle massage [14].

Compression helps to maintain positive MLD results. Importance of compression was known in ancient times, as documented by 4 thousands years old paintings on the rocks of Sahara [15]. Compression helps to avoid lymph stasis decreasing capillary filtration, improving lymphatic transport and improving function of venous muscular pump. It also helps in remodeling of thickened fibrous tissue. Application of compression dressing requires sophisticated technique, special low-stretch bandages and proper assessment of patients health status to avoid complications. Multilayered bandaging with low and medium stretch bandages is recommended in lymphedema [15]. Compression garments (sleeves, stockings etc.) are used to maintain the results of MLT, and are much more comfortable

Table 1. **Lymphedema therapy according to the disease stage [20]**

Stage	Symptoms	Phase I intensive	Phase II optimalization	Phase II b maintanence
Stage 0	Asymptomatic stage (possible detection with special imaging techniques only)	–	–	–
Stage I	A soft edema, reversible with eleveation or after a night rest	MLD: 1 x daily, compression banadging, decongestive exercises; duration of treatment 14-21 days	–	MLD: in cycles, exercises, compression: compressive garments occasionally or permanently
Stage II	An organized edema with tissue proliferation, no help with elevation	MLD: 2 x daily, compression banadging, decongestive exercises; duration of treatment 24-28 days	MLD: 1-2 x a week for 2-5 years, compression therapy: compressive garments, bandaging, decongestive exercises; Intesive phase should be repeated 2-3 x	MLD: in cycles or 1 x a week, decongestive exercises, compression: compressive garments permanently
Stage III	A hard, organized edema with extremity deformation (elephanthiasis), frequently skin changes (inflammation, severe hyperkeratosis, ulcerations)	MLD: 2-3 x daily, compression: banadging, decongestive exercises; duration of treatment 28-35 days	MDL: 2-3 x a week for 5-10 years, compression therapy: compressive garments, bandaging, decongestive exercise; Intesive phase should be repeated 3-8 x, consider surgical treatment	MLD: in cycles, or 1-2 x a week, decongestive exercises, compression: compressive garments permanently

MLD = manual lymphatic drainage, meticulous skin care is mandatory in all stages of lymphedema

than bandaging. These garments provide proximally decreasing compression of the extremities, and are available in four compression classes. Garments should be carefully chosen for the individual patients, and occasionally have to be custom made. Wear-off time differs for different garments, but generally they have to be replaced every 6 months.

Intermittent sequential compression utilizes pneumatic one or multichamber sleeve and a special pump to deliver intermittent pressure to the extremity. Chamber pressures, inflation and deflation time are regulated and individually adjusted depending on the type of edema and patient's tolerance. Usually compression time is longer than deflation time, and generally maximal chamber pressure should not be higher than patients diastolic pressure. For harder, fibrotic edemas, compression times are usually shorter and pressure lower. It should be remembered that high chamber pressure can damage delicate skin lymphatics [12]. Guidelines of The German Lymphological Society [16] do not recommend intermittent pneumatic compression as a sole therapy, and if prescribed should be always preceded by manual lymphatic drainage, otherwise it is not effective and can lead to several complications [17,18].

Decongestive exercises are important in lymphedema therapy [19]. Specific exercises improve lymphatic transport in edematous extremities (isometric, respiratory), enhance function of muscular venous pump (active), improve lymph transport in proximal lymphatic trunks (isometric and active neck exercises) and in a thoracic duct (respiratory exercises). All the exercises should performed in positions allowing help of gravitation. Exercise should not be too intensive in order to avoid accumulation of lactic acid and mauscular hyperemia leading to aggravation of edema. Elevation of the extremity allows gravitational drainage of lymphatic fluid and can supplement physiotherapy of lymphedema.

Therapy of lymphedema requires close cooperation between the patient and physiotherapist and is crucial for satisfactory therapeutic results. Patients should be well educated in the chronic nature and undulant course of the disease. Positive motivation and patient awareness are crucial to the success of decongestive therapy. According to Boris [17], active cooperation between the patient and therapist improve results of the therapy by 51% in patients with a lower extremity lymphedema, and by 36% in patients with an upper extremity lymphedema. Results of physiotherapy in lymphedema depend on the clinical stage of the disease and a presence of coexisting disorders (e.g. venous obstruction, decongestive heart failure, malignancy, neurological disorders, arterial ischemia, clotting disorders, collagen diseases etc.). Number and frequency of treatments depends on the phase of therapy (intensive, maintenance) and stage of lymphedema (*Tab. 1*) [20].

Complex interdisciplinary approach of the lymphedema team is the key to the success of lymphedema therapy.

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The importance of the health education in life quality improvement in patients with psoriasis

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Abstract

Purpose: The aim of the study was to determine the influence of the psoriatic patient knowledge of the disease on the quality of life.

Material and methods: The study was carried out in 149 patients with psoriasis. All patients answered on anonymous questionnaire, in according to Psoriasis Disability Index (PDI).

Results: Almost 43% patients could not show any factor which provoked their disease, 31.5% could not tell any recommendations for cure and care of the psoriatic lesions and 32.2% patients could not point out any methods to avoid psoriatic lesions spread. Almost 60% of the group admitted that their quality of life fell because of the disease. At the same time, patients who did not have enough information concerning the disease had lower quality of life index.

Conclusions: The level of the disease knowledge in the patients with psoriasis influences their quality of live. Therefore it is indicated for the patiens and their families to be involved in the proper educational program.

Key words: psoriasis, health education, life quality.

Introduction

In spite of its high frequency among dermatological disorders, psoriasis is not completely studied. Its prevalence in normal population is estimated, on basis of different reports, from 1% to 3%. Some authors consider that number to be over 5%, while underestimated frequency of the disease is due to hiding of this condition by many shy patients [1].

As there are currently known no drugs allowing persistent cure of the disease, one should focus on achieving with the therapy as long lasting remissions as it is possible [2]. On this stage cooperation with the nurses seems indispensable. Nurses in the course of their profession take care also of the education of the patient. Education influences positively health condition and by this quality of life. The educational process passes also knowledge, skills and psycho-emotional motivations, allowing partner interaction between a patient and a teacher. The aims of education are though making patients independent, producing motivation for therapy and counteract fear, depression and frustrations.

The aim of the study was to determine the influence of the psoriatic patient knowledge of the disease on the quality of life.

Material and methods

The study group consisted of 149 patients with diagnosed psoriasis in the remission. The study was carried out with the use on anonymous questionnaire, prepared according to Psoriasis Disability Index (PDI). The questionnaire included subjects from PDI concerning psoriatic patients' interpersonal contacts, free time activities, daily activities in school or work and not working or not studying patients' activities. The detailed questions were prepared estimation of the knowledge of psoriasis, self-care and its influence on the quality of life (QOL). The study tool consisted of 58 questions with the possibility of more than one answer for each question.

Statistical data elaboration included methods of description and examination of interactions for qualitative and quantitative data. For the statistical significance estimation of the observed interactions χ^2 test and single factor analysis of variance (ANOVA) was carried out. Correlation index was estimated as well.

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Results

The study group included 82 of women and 67 of men. Patients' mean age was approximately 41 years. Disease duration average time was 19.6 years and mean patients' age when the disease was diagnosed was 21 years. In more than 60% of patients the disease was diagnosed between 11th and 27th year of live. Psoriatic lesions in the studied group were present in the whole body area (39.6%), head (32.9%), elbows (27.5%), lower (26.8%) and upper extremities (21.5%). The most problems in a daily live were the skin desquamation (75.2%), reddening and swelling (each of approximately 60% positive answers).

At the beginning of the study patients level of the knowledge of psoriasis was explored. The onset of the disease was in the patients opinion due to stress (54.4%), infections (25.5%) and allergies (16.1%). However, 43% of patients could not find any provocative factor. For that reason knowledge level for symptoms, treatment, disease recurrence prophylactic and lesions care were studied. It was shown that 53.0% of patients had correct information as for psoriasis symptoms, but as many as 31.5% of patients could not tell any recommendations for psoriatic lesions treatment and care and 32.2% of subjects did not know how to prevent psoriatic lesions spread and recurrence.

In the studied group gender had no influence on the psoriasis knowledge level. On the other hand, patients in the age of approximately 46 years were more eager to seek an information on psoriasis during The Psoriatic Patients Association meetings (p=0.0008), while younger patients were not interested in that matter.

Almost 75.8% of patients had information concerning the disease from doctors and 13.4% had it from other psoriatic patients. Only five showed a conversation with nurse as an information source.

More than 60% of patients did not reconcile with the fact that they had the disease. Psoriatic patients declared the presence of some social problems: reduction of the number of friends (36.9%), social isolation (26.8%), loosing position in work (11.4%). Psoriasis had an influence on the partner choice in every third person and on the sexual lives in almost 60% of the studied group.

Most of responders (84%) had lowered psychophysical self-estimation due to psoriatic ailments and lack of the disease knowledge (57.8%). The majority of the patients (59.1%) stated that there was a fall in their quality of live.

The disease duration time and a live quality index correlated negatively (correlation index r=-0.21). It was a similar relationship between disease duration and the quality of live value: (the longer time of disease, the lower the live quality index).

In the final stage of the study the influence of patients' level of psoriasis knowledge on the quality of life was estimated. The knowledge type (disease etiology, symptoms, prophylactic, care) persons without sufficient information, estimated their quality of life lower (from 62% to 79% of answers). On the other hand, responders who declared better knowledge of many disease aspects, showed less frequent negative impact of the disease on the quality of live (from 50% to 71% of answers).

As there was a marked association between patients disease knowledge and a quality of live, there should be the same as for quality of live index. For five aspects which were used to verify psoriasis knowledge, statistically significant connection was found in three of them (*Tab. 1*) and like it was told before, patients better oriented in the disease and its specificity had higher quality of live index. The correlation between the prophylactic knowledge and influence on the quality of live assessment was also statistically significant (p=0.0003).

Table 1. **Patients' knowledge of etiology, treatments methods, prevention and and QOL index**

	Average quality index	Number	Standard deviation
Disease etiology and quality of life index (p=0.0817)			
Yes	19.0	34	5.84
A little	16.3	78	6.41
No	17.5	37	5.56
Total	17.2	149	6.14
Treatment methods and quality of life index (p=0.0111)			
Yes	19.4	42	5.07
A little	16.8	73	6.39
No	15.4	34	6,17
Total	17.2	149	6.14
Psoriasis prevention and quality of life index (p=0.00129)			
Yes	20.4	32	4.52
A little	17.0	69	6.34
No	15.4	48	6.07
Total	17.2	149	6.14

Discussion

Psoriasis, as a chronic and recurrent disease requires systematic treatment and proper care. In both cases there is an equal role for dermatologist, nurse, patient and his family. In treating the disease there need to be also a place for a proper health education. It should regard the patient during the disease exacerbation and remission. As a result of such an education there should be a rise in patient's consciousness and skills to chose the right in care of health, with the full social responsibility for that choice.

Cox and Bowman [3] in their work postulated to augment role of the nurse in the health education. They calculated that educational gain in psoriatic patients with the involvement of nurse into educational process was 16%. Warin stressed that nurses not only play a key role in the treatment, but also by their educational work, cut costs of patients medical care [4].

It seems important that patients' level of psoriasis knowledge influences significantly their quality of live. Responders, who stated not to be educated how to deal with the disease, estimated lower their quality of live. Also Kernicka et al. [5] showed, that in 20% of psoriatic patients education improved their live image.

Disease reveal, exacerbation or recurrence can be provoked by many exogenous and endogenous factors [6]. Almost 43% of patients could not point out any particular reason for the psoriatic lesions appearance. After analysing possible factors which could influence appearance of successive disease exacerbations, responders indicated the dominant role of the stress (54.4% persons). Al' Abadie et al. [7] showed significant correlation between the stress and psoriasis. Negative effect of the stress on the development and course of psoriasis was confirmed by Gupta et al. [8], Seville [9]. They observed, that the fear of social opinion can augment stress effect in the patients, and this in turn has a disadvantage on the disease course. Psoriatic patients have lowered QOL, which correlates significantly with feeling of stress. The localization of the disease lesions has an important influence on the lowering of the QOL. It was confirmed by this study the disease localization significantly influences the range of contacts between patients and other people. It is related mainly to those patients with lesion localization in visible body parts, easily "noticed" by others. In those patients self-estimation and the feeling of being socially attractive lowers. The obtained information allows stating that psoriasis provokes feeling of isolation from the rest of the society. Weiss et al. [10] showed, that psoriasis influences negatively on the social functions in comparison with persons without chronic diseases. Dooley and Finley [11] confirmed that 17% of patients were confused with the fact, that other people look at them or ask question regarding their skin status. It is reasonable to stress that the nurse preparing for the contact with psoriatic patients should first at all be aware of her own relation to that disease. All negative convictions in this matter disqualify her as an adequate person for taking care of a patient with skin disorders. Nurse negative emotional background can communicate the patient the reluctance, aversion or abomination. Such a behavior can be additionally received by the patient as a rejection and a lack of acceptance, provoking emotional discomfort.

It was demonstrated, that psoriasis and its exacerbations can provoke depression in patients, leading to suicide. Ginsburg [12] described depression, as a secondary phenomenon due to already existing skin lesions, suggesting that as the psoriasis is more serious the depression also deepens. The emotional changes are due to the disease course: the longer the disease duration the worse emotional consequences for patients. For this reason people taking care of such patients should understand their behavior in a stressing situation like the disease. It is very important, because through nursing process it is possible to help patients in expressing conscious and subconscious emotions and creating in them specific strategies to deal with the stress. It should be underlined, that psychological education favors health through reducing negatives psychological stress results [13]. We noted that 75.1% of patients declared need for psychological backup.

According to Koper et al. [14] patients' QOL improvement can be influenced by the existing of associations, in which there is possibility to talk about ones problems and obtain indispensable information helpful in dealing with the disease. In Psoriatic Patients Associations meetings participated only 32.8% of the patients and dominated patients with approximately 21 years of history of the disease, city habitants. Only 3.4% persons living in country were members of the association.

Conclusions

Patients' level of knowledge about the disease, triggering factors, prophylactic and treatment methods influence their quality of life assessment. Not only psoriatic patients, but their families and friends should be educated. Every psoriatic patient and his relatives should be involved into educational program. Interdisciplinary teams involved in the dermatological education should be appointed to take care of the psoriatic patients in a holistic way.

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Assessment of risk for pressure ulcers using the Norton scale in nursing practice

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Abstract

Purpose: The aim of our study was risk assessment for the development of pressure ulcers and thus defining a group of patients considered to be at risk of developing pressure ulcers. It also helped to define the role of the nurse in the early assessment of the risk for developing pressure ulcers.

Material and methods: Risk assessment for the development of pressure ulcers was carried out in 199 patients hospitalised in The District Hospital in Bielsk Podlaski. The research was carried out with patients admitted to The Departments of General Medicine, Infectious Diseases and Long-Term Care. Risk assessment for the development of pressure ulcers was performed with the aid of the Norton scale.

Conclusions: An increased risk for the development of pressure ulcers was found in more than half of the patients examined (53.8%). Pressure sores developed in 17.6% of the patients, women being at significantly greater risk. Risk assessment for the development of pressure ulcers with the aid of one of the recommended scales facilitates the early recognition of those patients at risk of developing pressure ulcers.

Key words: pressure ulcer, risk assessment, nursing.

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Introduction

Pressure ulcers are a considerable problem in people with serious health difficulties. For many years they were thought to be the result of inadequate nursing care. However, once the aetiology of pressure ulcers was understood, it became clear that, in patients with impairments of mobility and sensation, incontinent of urine and faeces, who are receiving inappropriate nourishment and have incorrect fluid balances, they are a sign of irreversible deterioration [1,16]. The proportion of pressure ulcers in newly hospitalised patients is somewhat variable and ranges between 0.4% to 38% [10]. Following admission to a hospital ward, all patients should be assessed in terms of their risk for developing pressure ulcers. Risk assessment for pressure ulcers is based on observation of the patient's health status with the aid of one of the recommended scales e.g. Norton, Waterlow, Douglas. The resultant score is recorded in the appropriate documentation, which forms part of the patient's case notes.

The aim of our study was to carry out a risk assessment of pressure ulcers using the Norton scale and to identify the group of patients that were at greatest risk of developing ulcers. A further aim was to define the role of the nurse in the early assessment of the risk for developing pressure ulcers.

Material and methods

The study was carried out among 199 hospitalised patients in The District Hospital of Bielsk Podlaski from 2002 to 2003. *Tab. 1* shows the characteristics of the patient sample.

Risk assessment for pressure ulcers was carried out with the aid of the Norton scale in which the following risk factors are taken into consideration: the general health status of the patient, level of consciousness, level of mobility, continence of urine and faeces, independence in the ability to change body position. Each of these factors is assessed on a scale of 1 to 4 points and the patient may score between 5 and 20 points overall. An increased risk for the development of pressure ulcers is

Table 1. **Characteristics of patients n=199**

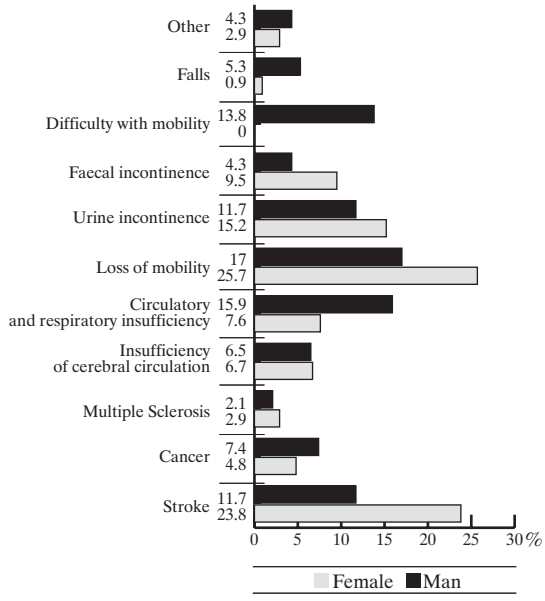
	Infectious diseases		Long-term care		General medicine	
	n=82	%	n=28	%	n=89	%
Female	43	52.4	13	46.4	49	55.1
Men	39	47.6	15	53.6	40	44.9

Sex	Female		Men	
Age	n=105	%	n=94	%
40-64	7	6.7	4	4.3
65-89	93	88.6	88	93.6
90- <	5	4.7	2	2.1

Table 2. **Assessment of risk for pressure ulcers using the Norton scale**

Sex	Female		Men	
The risk	n=105	%	n=94	%
High ≥14 points	59	56.2	48	51.1
Low <14 points	46	43.8	46	48.9

Figure 1. **Reasons for hospitalisation of the sample (%)**



considered to be represented by a score of 14 points or less, whilst a score above 14 represents a low risk for the development of ulcers [4,6,7,12,13].

Results

In considering the information presented in *Tab. 1*, it is worth noting that the greatest proportion of patients (91%) were in the age range 65-89 years. *Fig. 1* shows the reasons for admission in relation to the hospital wards to which the patients were admitted: Departments of General Medicine, Infectious Diseases and Long-Term Care. The most frequent reasons for admission in the case of female patients were immobility (25.7%), stroke (23.8%), urine incontinence (15.2%) and faecal incontinence (9.5%). Male patients were most frequently admitted for reasons of: immobility (17%), circulatory and respiratory insufficiency (15.9%), difficulties with mobility (13.8%), stroke (11.7%) and urine incontinence (11.7%).

Pressure ulcers most commonly occur in patients who have been considerable weakened by long-term illness, those in the advanced stages of cancer, patients who are bedridden, those with disturbances of consciousness, with limited mobility, those of advanced age and those who are unconscious. It is extremely important to prevent the development of pressure ulcers by ensuring that the patient's body position is regularly changed and to increase standards of hygiene in patients who are incontinent of urine and faeces, as well as ensuring that the skin is protected against damage and maceration [4].

Among the patients examined in this study, an increased risk for the development of ulcers was found in 107 cases (59 women and 48 men) which represented 53.8% of the sample. A low risk was found in 92 patients (46 women and 46 men) which is 46.5% of the sample (*Tab. 2*).

During the period of hospitalisation, pressure ulcers developed in 35 (17.6%) of the patients, of whom 21 (10.1%) were women and 14 (7%) were men. The most frequent occurrence for ulcers was in the sacral and iliac area, on the buttocks and heels.

Discussion

Pressure ulcers are a serious problem for both the patient and the nursing staff involved in his/her care. They are the result of circulatory insufficiency to the affected tissues over long periods of time, due to repeated pressure. It is extremely important to follow the appropriate guidelines for prevention in those patients considered to be at increased risk of developing pressure ulcers. Prophylactic care of this kind depends on the identification of early signs (reddening of the skin which does not disappear once pressure has been released, blisters and abrasion of the epidermis, thickening, reddening and swelling as well as slight increases in body temperature) [4,18].

There are a number of scales which attempt to assess the risk of developing pressure ulcers. They differ from one another significantly in terms of the variables used to characterise sensitivity and precision. This is most likely a result of methodological differences between studies, clinical conditions and the patient populations studied. The ideal scale for the risk assessment of pressure ulcers would have high sensitivity and precision, as well as being straightforward to use [13].

Risk assessment for pressure ulcers with the aid of the recommended scales should be repeated on numerous occasions in association with a very precise examination of the condition of the patient's skin, as pressure ulcers may develop even in those patients in whom the risk assessment is minimal [15,19].

In the present study, more than half of the sample examined were found to be at high risk of developing ulcers and these are in keeping with the results of previous studies.

In a study reported by Sopata et al. carried out in a sample of palliative care patients over a period of 30 months, the risk of developing ulcers was assessed in 265 patients. It was found that at the point of admission, 50% of the patients were considered to be at risk (Norton <14 points) and a further 16% were added to this high risk group as a result of a steady deterioration in their health during the period of hospitalisation. However, only 23% of patients actually developed ulcers during the hospitalisation period [16].

Using the Douglas scale to assess the risk of pressure ulcers, Niecikowska examined 30 patients with lung conditions and found that 23% were at low risk, 74% at moderate risk and 3% of the patients were at high risk. In the patients at moderate risk, 29% went on to develop pressure ulcers, whilst in the high risk group only one patient went on to develop ulcers [11].

Bergstrom et al. assessed ulcer risk in 843 patients using the Braden scale and reported that pressure ulcers developed in 12.8% of their patients. Those at higher risk of developing ulcers were older people and women [2].

In a study of 220 patients in a nursing home, both the CBO scale (Consensus Prevention of Bedsores according to Duth) and the Norton scale were used in order to determine which of the two scales performed better at predicting the development of pressure ulcers. It was found that both scales gave similar results, but that the Norton scale is shorter and easier to use by community nurses and family doctors [8].

It is difficult to give a precise figure for the frequency of development of pressure ulcers in Poland, or indeed for the cost of their treatment. It is therefore necessary to determine the extent of the existing problem and to introduce the appropriate prophylactic measures [16,17].

In many hospitals there is as yet insufficient awareness of the need to address the problem using preventative measures. Furthermore, such hospitals do not have a committee for the prophylaxis of pressure ulcers, proper records are not kept detailing the causes of ulcers nor of the number of patients at risk. The main aim of a programme for the prophylaxis of pressure ulcers is to gather information about the causes, incidence and extent of ulcers as well as to determine the numbers of patients that are at risk [5].

A fundamental example of the kind of prophylactic activities that can be undertaken by nurses in order to reduce unnecessary discomfort and suffering is the use of, and compliance with, prophylactic standards for pressure ulcers. Among patients in whom these standards have been applied, the indicator for ulcers was 0.48% [13]. In our own study however, where the standards were not followed, ulcers developed in 17.6% of patients.

The application of prophylactic standards for ulcers facilitates the achievement of a recognised course of action with patients at risk and allows nurses to follow a unified set of criteria when determining the risk of ulcers in hospitalised patients, as well as having an influence on the quality of care delivered [14,20]. Current advice is that the risk of ulcers should be assessed in every newly admitted patient during the first 2 hours of his/her hospital stay using one of the recommended scales (Norton, Waterlow, Douglas or other recognised scales which allow the risk to be assessed). The assessment should be repeated whenever the health status of the patient requires intensive nursing care. Concurrently, it is important to keep the necessary documentation. In patients in whom the risk of developing ulcers is high, documentation for patients at risk of ulcers should be kept. If patients go on to develop ulcers, it is necessary to set up the necessary documentation for patients with ulcers and documentation for patients at risk of ulcers [20,21].

On admission, it is the role of the nurse, amongst others, to assess the risk of ulcers and where a high risk is indicated, to introduce the required preventative procedures. If the condition of the patient deteriorates, the assessment should be made every day and if he/she is stable, once a week. The course of any prophylactic activities should be planned and the proposed actions recorded in the documentation [14].

Every practising nurse is obliged to ensure that the appropriate and safe prophylactic measures are carried out in order to meet the needs of individual patients. Patients with chronic conditions, who are immobile in the long-term, have difficulties with changing their body position independently, with impairments of sensation, circulation and nutrition should form the focus of her attention, in order to reduce complications, pain and additional suffering [9].

Patients at home in the care of their families are also at risk. It is extremely important, sometimes even a priority in these situations, to provide education and training to these patients and their families [3]. Professional assistance in preparing carers for the task of self-care helps to increase their awareness and skills and creates the conditions for better comfort and an improved quality of life in the conditions of the home.

Conclusions

1. An increased risk for the development of pressure ulcers was found in more than half of the sample studied (53.8%). Ulcers developed in 17.6% of patients and women were found to be at significantly greater risk.
2. Risk assessment for the development of ulcers using one of the recommended scales facilitates early recognition of the risk for developing pressure ulcers in patients.
3. It is recommended that standards for the prevention of pressure ulcers should be adopted in nursing practice and that a systematic analysis of the resultant course of action in at risk cases be undertaken.

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Lung cancer in the elderly – increasing epidemiological problem of 21st century

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Abstract

Lung cancer is the second most common malignant neoplasm after prostate and breast cancers. It is the most frequent cause of death related to neoplasms. The elderly people over 65, are the most numerous population suffering from lung cancer. Risk of incidence and death increases with aging process. In majority of patients, diagnose is established in highly advanced neoplastic process. More than 80% of all types of lung cancers make non-small cell lung cancer (NSCLC) and less than 20% – small cell lung cancer (SCLC). The choice of the managment must be individually considered and should be based on the stage of cancer clinical advance, clinical and functional status, concomitant diseases, nutritional status, cognitive functions. The patients age is not a contradiction for the introducement of the treatment. Surgical treatment is a method by choice at the early stages of NSCLC. Radical radiotherapy should be introduced in the elderly disqualified from the operation. Single-agent chemotherapy seems to be benficial for the elderly with advanced NSCLC in good general condition, mainly due to less toxicity and satisfactory the survival rate. In the cases of SCLC polychemotherapy with prophylactic brain radiation is the first-line managment. Unfortunately, the effectivity of the therapy is occupied by its toxicity. Still frequent occurrence and late diagnosis of lung cancer, high mortality, low efficiency of chemo- and radiotherapy causes the necessity of newer research for more effective screening methods, more effective and safer lung cancer treatment schemes for the elderly.

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Introduction

Both in developing and developed countries the aging tendency of communities is noticeable. Nowadys the number of people over 65 is increasing, whereas the birth rate is decreasing. In population of the elderly the frequency of the occurrence of cancer is the highest. It stands for 61% and 56% for the men and women respectively [1]. Among those patients, the overage of cancer appearence is 69 in men and 67 in women [2]. Cancers occur almost 7 times more often in elderly men and about 4 times more often in elderly women in comparison with younger individuals [1].

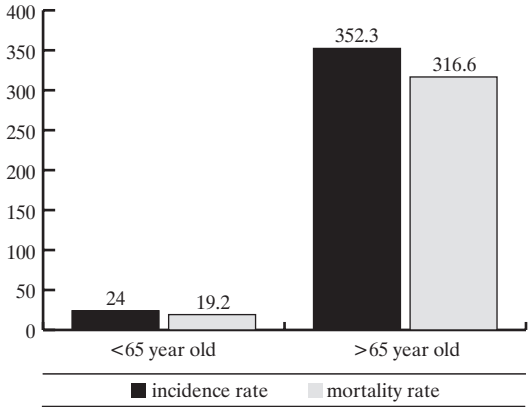
Epidemiology of lung cancer

Lung cancer is the most frequent cause of death related to neoplasms [2]. In Poland, about 20000 people, including 15000 of men die of this cancer every year. Annually, about 163000 deaths of cancer are documented in The U.S.A., including 92000 of men and 66000 of women [3]. The risk of death increases with aging and is about 16.5 times higher in the elderly than in younger patients [4] (*Fig. 1*).

There can be also observed the strong dependence between tobacco smoking and the risk of death. The risk of death from lung cancer is 33 times higher in smokers than in non-smokers [5]. The 5-year survival rate stands for 8-13% [5]. However, only 7% of patients achieve 10-year survival period, which confirms the high mortality rate of this type of cancer [6]. The survival rate is related not only to the age of the patient, but also to cancer biology, its histological type and clinical advance stage as well [5].

More than 80% of all types of lung cancer make non-small cell lung cancer (NSCLC) and less than 20% – small cell lung

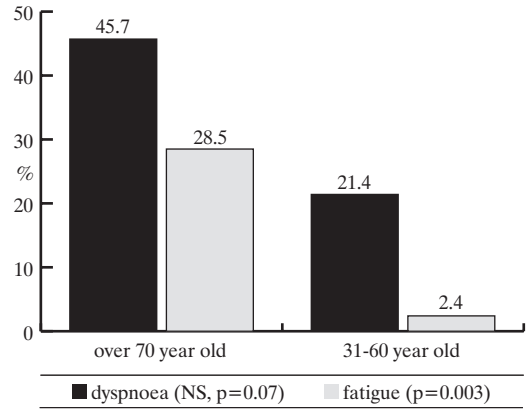
Figure 1. **Incidence and mortality rate of lung cancer (1996-2000)***



Rates are per 100 000 and are age-adjusted to the 2000 U.S. standard population by 5-year age groups (after SEER Cancer Statistics Review 1975-2000)

* Ries LAG, Eisner MP, Kosary CL, Hankey BF, Miller BA, Clegg L, Mariotto A, Fay MP, Feuer EJ, Edwards BK. SEER Cancer Statistics Review, 1975-2000; National Cancer Institute, Bethesda 2003 [4]

Figure 2. **Clinical manifestations present in NSCLC patients on the admission – own observations***



* Czwojda K, Batura-Gabryel H, Młynarczyk W. Rak niedrobnokomórkowy płuca w wieku starszym. Gerontologia Polska, 2000; 8(3): 31-5 [9]

cancer (SCLC). Unfortunately, in about 75% of patients, the diagnose is established at 3rd or 4th clinical advance stage according to the AJCC criteria, which stands for a highly advanced neoplastic process [6].

Lung cancer is the second most common malignant neoplasm after prostate and breast cancers [2]. Annually about 170 000 of new cases of lung cancer, including 90 000 in men and 80 000 in women are diagnosed in The U.S.A. [3]. In Poland, in 2000, the sick rate of lung cancer was about 21 500 [7]. It is predicted that in 2010 – 34 000 of people (i.e. 26 000 men and 8 000 women) will fall ill of lung cancer in our country. Tobacco smoking habit is responsible for such a high lung cancer incidence. Other risk factors are: carcinogens, genetic factors, nutritional habits, poor social status, selected pulmonary diseases like chronic obstructive pulmonary disease (COPD), tuberculosis, asbestosis, silicosis, disseminated pulmonary fibrosis. Hormone replacement therapy (HRT) seems to be an additional risk factor in women. The risk of lung cancer in female tobacco smokers is 13 times higher and in female tobacco smokers undergoing HRT treatment it is 32.4 times higher than in non-smoking women [8]. The elderly are the most numerous population suffering from lung cancer [6]. More than 50% of patients with lung cancer are over the age of 65 and over 30% are over 70 [2]. In individuals over 65 years, the risk of lung cancer occurrence is 14.7 times higher than in younger patients (*Fig. 1*) [4]. Lung cancer diagnosis and treatment in elderly patients is a very important epidemiological problem of 21st century.

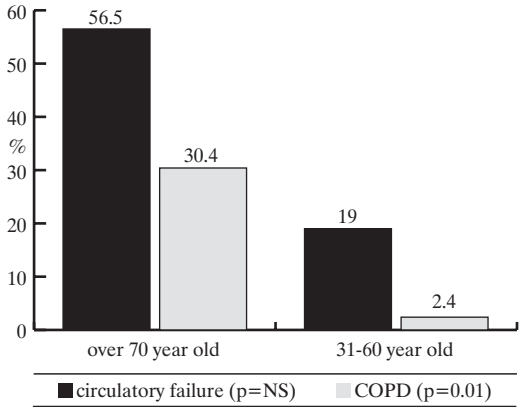
The individual assessment of elderly patients

Recently a calendar age was the basic factor taken into consideration on qualifying the patient for a treatment. Decisions about the type of managment were based on that factor. The commonplace approach to the problem of lung cancer in elderly was the main cause of it [9]. Last clinical trials changed this situation. It is proved that the biology of neoplastic cells doesn't depend on the age. It has been concluded there is no dependence between the time of appearence of metastases and the patients's age [9]. Since elderly patients constitute a very differentiated population in respect of health, the biological, not calendar age is important for planning their treatment [2,6]. In order to obtain a proper estimation of the biological age, we need to perform an individual and detailed assessment of the clinical and performance status. Clinical assessment is particulary necessary before chemotherapy. The activity of hepatic enzymes responsible for drugs metabolism decreases by 30% and the glomerular filtration rate falls by 1 ml a minute every year in people over 40 [10]. The functional status shows the elderly patients ability to independent performance of daily tasks at home and in the community [6]. Particular scales are used to assess it (e.g. ECOG or Katz-ADL).

It is also important to take co-existing diseases into consideration. They significantly influence the course of treatment, frequency of toxicities appearence and the survival rate. Sometimes comorbidity can be more dangerous for the patient's life than neoplastic disease [6]. It often happens in case of a circulatory failure, which is very common in elderly people. Some of symptoms of comorbid medical conditions are similar to symptoms of lung cancer, which may delay giving the right diagnosis. Sometimes inflammatory symptoms from the respiratory tract are too long treated with antibiotics, often without making lungs X-ray. The first line phycisians should be alert, especially when meeting an elderly patient who happens to be tobacco smoker exposed to other related risk factors of lung cancer [5].

Nutritional status and a cognition ability of elderly patients is worth assessing before planning the treatment [6]. Both poor

Figure 3. **Presence of co-existing diseases at the moment of the NSCLC diagnosis – own observations***



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nutritional status and dementia are adverse prognostic factors [6]. Weight loss of 5% and more increases the risk of death [6]. Impairment of cognitive functions, especially related to vascular pathology of The Central Nervous System, which very often exists in the elderly, may be the cause of problems with communication. Patients complain about a broad range of symptoms from different organs. It can delay the diagnosis of cancer. Sometimes elderly patients hide their ailments in fear of hospitalization or examination [9]. It is necessary to remember about drug usage by elderly patients. Possibility of interactions between them and cytostatic treatment should be considered. Some drugs may intensify toxic effects [6].

At The Pulmonology Department of Karol Marcinkowski University of Medical Sciences in Poznań we examined a group of 70 patients suffering from NSCLC at the age of 70 and older, and we compared them with another group of 42 patients aged from 31 to 60. Analysing histopatological diagnoses we didn't find statistically significant differences between those two groups. The most frequent type of NSCLC was *carcinoma planoepitheliale* (78.5% vs 64.2% respectively). Among clinical manifestations on the admission, fatigue was the most frequent statistically significant (p=0.003) syndrome in the elderly patients (*Fig. 2*). Differences close to statistical significance were found in paraneoplastic syndromes which dominated in younger patients.

In 65% of the elderly patients underlying diseases were diagnosed, which siginificantly distinguished this group (p=0.03). Circulatory system diseases (56.5%) and COPD (30.4%) dominated among those patients (*Fig. 3*).

At the moment of making the diagnosis, in both groups, 3rd and 4th stage of clinical neoplastic advance was established. In the elderly patients treatment was introduced in 54.3% of the cases, whereas in the group of younger patients in 90.5% (p=0.03). Radiotherapy was a common method of treatment in the elderly, chemotherapy and concurrent radiochemotherapy in younger patients. In both groups only few patients were treated using surgical methods. What influenced the treatment was: the stage of cancer clinical advance and the presence of concomitant diseases disqualifying patients from more aggressive schemes of treatment [9]. Results of our examination confirm the necessity of an individual approach to the elderly, suffering from lung cancer, during making decisions about their treatment. It is necessary due to specific symptoms and course of disease in the elderly.

Lung cancer treatment in elderly patients

In the early stages of clinical advance of NSCLC a surgical operation is an adviseable method of treatment [6,11]. The age of the patient is not a contraindication against the operation [11,12]. If there is a possibility of total tumor excision, the survival rate is at the same level among elderly and younger patients. It was documented that lobectomy and even pneumonectomy is well tolerated by the elderly [13]. Frequent presence of respiratory and circulatory changes related to aging process and pathological changes, was an essential obstruction to the surgical treatment. Smoking, presence of COPD and circulatory system diseases increases the risk of postoperative morbidity and mortality. The most frequent cause of renouncement from surgical treatment is a poor condition of the patient and presence of concomitant diseases. Therefore, when planning surgical treatment in the elderly, it is necessary to assess their general clinical status, presence of the accompanying diseases and pulmonary status as well [13]. The neoplastic stage assessment is also necessary. Both an appropriate choice of surgical treatment and specialistic postoperative care in this group of patients are necessary [6]. Recently the progress in video-assisted thoracic surgery (VATS) techniques caused this kind of treatment to have become the alternative to standard thoracotomy in the elderly. The greatest VATS advantage is the shortening of recovery period and reduction of the number of postoperative complications [14]. At the early stage of NSCLC the radical radiotherapy is an option for the elderly patients who were disqualified from the surgical treatment [6,15,16]. Recovery is the aim of the radiotherapy [2]. Unfortunately, the results of radiotherapeutic treatment are worse than those of surgical treatment, which is confirmed by shorter survival period rate [6]. It was established that the age of the patient does not have a negative influence either on a process of the treatment or an early and late adverse effects of the radiotherapy [6]. Malnutrition is a factor which worsens the survival rate and increases the risk of postoperative death, due to secondary severe respiratory infections [17]. In the cases of local advanced cancer in the elderly, longer postoperative survival was achieved on applying concurrent radiochemotherapy. Hovewer, this sort of post-treatment toxicity indicates that radiotherapy as the only way of treatment seems to be more beneficial for the patient from this group [6]. In the advanced NSCLC radiotherapy is introduced as a paliative managment [6] with the symptoms of the NSCLC like thoracic pain, superior caval vein syndrome, haemoptysis. Chemotherapy is reserved for the advanced stages

of NSCLC and is introduced as mono- and polytherapy. It was proved that among the elderly with satisfactory functional performance, polychemotherapy is well-tolerated [10]. The adverse effects may occur more frequently in this group of patients, especially when cisplatin was introduced [6,10]. Introducing carboplatin instead of cisplatin reduced toxicity of the therapy [6]. Vinorelbine or gemcitabine single-agent chemotherapy seems to be very beneficial for the elderly [6,10,18]. Vinorelbine monochemotherapy in comparison with the best paliative care is related to the longer survival rate and improved quality of life [2,10]. Single-agent chemotherapy seems to have the same efficiency as a combination chemiotherapy and less toxicity, but it requires additional study [6]. On account of toxicity of cytostatic treatment, which occur as severe myelosuppression and infections, it is necessary to carefully qualify patients to this treatment, focusing on their performance status and presence of co-existing diseases [10]. Hematopoietic growth factors are recommended to decrease the risk of neutropenia [6].

In contrast to NSCLC, in SCLC the treatment by choice is chemotherapy with additonal thorax radiation [6,19]. In a small number of patients this results in complete recovery [6]. Retrospective surveys revealed that in the elderly lower doses of drugs are introduced, in comparison to younger patients, hovewer, effects of the treatment are similar [19]. In the elderly, the most common scheme of therapy is 2-drug chemotherapy with carboplatin and etoposide. The most frequent adverse effect of the therapy is myelosuppression. It is necessary to discuss introducing hematopoietic growth factors during therapy [6]. After achieving complete disease remission, prophylatic brain radiation is advised. Before applying this, it is necessary to assess cognitive functions. An increased number of adverse effects after brain radiation in patients with cognitive impairment was documented [6].

Conclusions

Poor outcomes of lung cancer treatment in the elderly (as in younger patients) are the result of late disease diagnosing and also much seldom applying of antineoplastic treatment due to advanced age of this population. In the past, the disqualifying criterion for surgical treatment was age over 65. Refusal of patients management only because of the age is harmful and deprives them of the chance for a longer life and of higher quality of it. The choice of the treatment in elderly must be individually considered and should be based on the stage of cancer clinical advance, clinical and functional status, concomitant diseases, nutritional status and administered drugs. The proposed management should combine predictive therapeutic benefits with less possible adverse effects. Frequent occurrence and late diagnosis of lung cancer, high mortality, low efficiency of chemo- and radiotherapy causes the necessity of newer research for more effective screening methods, more effective and safer lung cancer treatment schemes for the elderly.

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The evaluation of parodontium in medical students of The Medical University of Białystok according to CPITN index

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Abstract

Purpose: **The aim of the study was the evaluation of parodontium according to Community Peridental Index of Treatment Needs (CPITN) index in 455 students of The Medical and Dentistry Department of The Medical University of Białystok.**

Material and methods: **After the examination, the students filled a survey according to their own project concerning hygienic habits as well as smoking, sweet intake. The results underwent statistical analysis.**

Results: **There were 1334 (48.86%) sextants observed with healthy parodontium in the studied population. Gingivorrhoea was stated in 440 sextants (16.12%), more often in men than in women. Calculus was reveled in 790 sextants (28.94%) of the population. The number of sextants with code 3 was 1.76%. Sextants with shallow pockets were more numerous in women (37 sextants) than in men (11 sextants). Advanced changes in parodontium (code 4) were observed in 9 sextants (0.33%). On the basis of the analysis of treatment needs in the group of 455 students, it can be stated that only 24.62% of the examined subjects did not need parodontium treatment.**

Conclusions: **The diagnosis of parodontopathy and the factor that can have harmful influence on the parodontium tissues in young people is a superior criterion in the fight with irreversible parodontium changes in adults.**

Key words: CPITN, the condition of parodontium.

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Introduction

According to Górska [1], the first exponent of parodontopathy is the age. The series of epidemiological studies revealed that the course of the disease in elderly people is faster and the destructive changes in parodontium are more advanced than in young people. It can be connected with accumulative activity of dental plaque, organism senescence and thus, decreased immunity of the organism or intensified destructive processes. However, the disease seems to spread among young people and the problem is not issued properly. And it is well known that chronic changes in parodontium in adults have their roots in the period of childhood. Therefore, early diagnosis and determination of the effective factor are of great importance before irreversible changes in parodontium occur.

Material and methods

The examined group consisted of 315 students of The Dentistry Department and 140 4th-year-students of The Medical Department of The Medical University of Białystok. The subjects were of both sexes, in the age range from 18 to 32 years.

The students were examined in the period from December 2001 to the end of June 2002 in clinical rooms of The Conservative Dentistry and Parodontal Diseases Department of The Medical University of Białystok. The examination was carried out according to the guideline of The World's Health Organization [2], with the use of artificial light, the mirror, and standard bilateral periodontological probe. The probe is equipped with a blunt end with a minimetric scale (from 3.5 to 5.5 mm) used for measuring the depths of gingival pockets, and a sharp diagnostic probe.

Parodontium was evaluated using periodontological index of treatment needs (CPITN-Community Periodontal Index of Treatment Needs) [3,4]. For the convenience of the index, the oral cavity is divided into 6 sextants, which cover as follows: the molars and premolars at both sides of the arch that form

Table 1. **Parodontium condition of 455 subjects expressed with number (n), percentage (%), and mean number (x) of sextants with particular values of CPITN**

CPI		The age of subjects in years															
		18	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**30**	**32**	**Woman**	**Men**	**Totality**
Number of subjects		1	22	85	38	71	138	60	20	11	3	3	2	1	315	140	455
Sextant number		6	132	510	228	426	828	360	120	66	18	18	12	6	1890	840	2730
0	N	6	74	245	120	198	375	200	59	39	2	10	6	0	955	379	1334
	%	100.0	56.06	48.04	52.63	46.47	45.28	55.55	49.17	59.09	11.11	55.55	50.0	0	50.54	45.11	48.86
	X	6	3.36	2.88	3.16	2.79	2.72	3.33	2.65	3.18	0.66	3.33	3	0	3.03	2.71	2.89
1	N	0	25	97	26	61	148	35	25	13	3	5	0	2	294	146	440
	%	0	18.95	19.10	11.40	14.31	17.87	9.72	20.83	19.70	16.67	27.78	0	33.33	15.56	17.38	16.12
	X	0	1.13	1.14	0.68	0.86	1.07	0.58	1.25	1.18	1	1.66	0	2	0.93	1.04	0.97
2	N	0	29	142	69	148	258	87	29	11	9	0	6	2	518	272	790
	%	0	21.97	27.85	30.26	34.74	31.15	24.16	24.17	16.67	50.0	0	50.0	33.33	27.41	32.38	28.94
	X	0	1.32	1.67	1.81	2.08	1.87	1.45	1.45	1	3	0	3	2	1.64	1.94	1.75
3	N	0	2	6	2	8	18	7	2	1	2	0	0	0	37	11	48
	%	0	1.51	1.18	0.88	1.87	2.17	1.94	1.67	1.51	11.11	0	0	0	1.97	1.31	1.76
	X	0	0.09	0.07	0.05	0.11	0.13	6.11	0.1	0.09	0.66	0	0	0	0.12	0.08	0.30
4	N	0	0	0	0	0	3	3	1	0	2	0	0	0	7	2	9
	%	0	0	0	0	0	0.36	0.83	0.83	0	11.11	0	0	0	0.38	0.24	0.33
	X	0	0	0	0	0	0.02	0.05	0.05	0	0.66	0	0	0	0.02	0.01	0.02
X	N	0	2	20	11	11	26	28	4	2	0	3	0	2	78	31	109
	%	0	1.51	3.92	4.83	2.58	3.14	7.78	3.33	3.03	0	16.67	0	33.33	4.14	3.69	3.99
	X	0	0.09	0.23	0.28	0.15	0.20	0.46	0.2	0.18	0	1	0	2	0.25	0.22	0.31

4 lateral groups, and the frontal teeth (from the canine to the canine) – 2 frontal groups. A sextant does not undergo the clinical examination if there are at least 2 fully functional teeth. Single teeth are considered as adjacent groups. The evaluation of the parodontopathy (Community Periodontal Index, CPI) is carried out in the 5-stage scale – code 4: pocket – when there is a parodontal pocket with the depth of 6 mm or more; code 3: pocket – the parodontal pocket of 3.5-5.5 mm in depth; code 2: calculus – when there are calculus over- and/or subgingival or overhanging fillings; code 1: bleeding – if gingivorrhoea occurred during or after the sextant probing; code 0: healthy – healthy parodontium.

The following categories of treatment need (TN) correspond to above mentioned codes CPI: TN 0 – there is no need of treatment; TN 1 – points to the necessity of the training of the oral cavity hygiene; TN 2 – points to the necessity of the training of the oral cavity hygiene, scaling and the removal of overhanging fillings and crowns at the edge of the gingiva; TN 3 – the training of the oral cavity hygiene is necessary, scaling, the removal of overhanging fillings and crowns at the edge of the gingiva and complex treatment.

After the treatment, the students filled up the survey, constructed by them, which concerned hygienic habits (the frequency of toothbrushing, the kind of movements while toothbrushing, the frequency of the toothbrush change, the use of additional hygienic equipment) as well as smoking, sweet intake, and susceptibility to stressful factors.

Mann-Whitney test and Chi^2 Pearson test were used for the evaluation of statistical differences between particular features and their significance.

Results

The condition of parodontium and treatment needs were evaluated with the use of the Community Periodontal Index of Treatment Needs (CPITN). The assessment of 2730 sextant condition (455x6) was presented in *Tab. 1*. There were 109 sextants (3.99%) excluded from the study. The mean number of sextants excluded was highest in a 32-year-old person and equaled 2. In the examined population, 1334 sextants showed healthy parodontium (48.86%), the least number was observed in the group of 27-year-old subjects (11.11%), as compared to an 18-year-old person (100%) and 26-year-old participants (59.09%). Women had slightly higher percentage of sextants with healthy parodontium (50.54%) comparing men (45.11%). Gingivorrhoea was revealed in 440 sextants (16.12%), more frequently in men than in women. This parameter was higher in subjects of 28 and 32 years of age in comparison with the group of 24-year-old students. Calculus was stated in 790 sextants (28.94%) and the mean was 1.75 per person. The lowest mean sextant number with code 2 was observed in people of 26 years of age (1) comparing with 27- and 30-year-old subjects (3). Women had slightly lower number of sextants with calculus than men. The number of sextants with code 3 was highest in 27- and 23-year-old students while 21-year-old ones presented the lowest number. More sextants with shallow plaque were observed in women (37 sextants) than in men (11 sextants). Advanced changes in parodontium (code 4) were seen in 9 sextants (0.33%) and they concerned 0.38% of women (7 sextants) and 0.24% of men (2 sextants) in the age-groups of 23-25 and 27 years.

While analyzing the treatment needs among 455 students

Table 2. **Parodontium treatment needs in 455 examined subjects**

Categories of treatment needs		The age of subjects in years															
		18	19	20	21	22	23	24	25	26	27	28	30	32	Woman	Men	Totality
Number of subjects		1	22	85	38	71	138	60	20	11	3	3	2	1	315	140	455
TN 0 (CPI 0)	N	1	12	20	7	12	27	23	6	2	0	1	1	0	86	26	112
	%	100.0	45.45	23.53	18.41	16.90	19.57	38.33	30.0	18.18	0	33.33	50.0	0	27.30	18.57	24.62
TN 1 (CPI 1)	N	0	3	9	3	4	16	2	4	3	0	2	0	0	28	15	43
	%	0	13.64	10.59	7.89	5.63	11.59	3.33	20.0	27.27	0	66.67	0	0	8.89	10.71	9.45
TN 2 (CPI 2+3)	N	0	7	56	28	55	94	34	10	6	2	0	1	1	199	98	297
	%	0	40.91	65.88	73.68	77.46	68.12	56.67	50.0	54.55	66.67	0	50.0	100.0	63.18	70.10	65.27
TN 3 (CPI 4)	N	0	0	0	0	0	1	1	0	0	1	0	0	0	2	1	3
	%	0	0	0	0	0	0.72	1.67	0	0	33.33	0	0	0	0.63	0.71	0.66

(*Tab. 2*), we could observe that only 24.62% of the examined group did not required the treatment of the parodontium, more women (27.30%) than men (18.57%). The category TN0 of treatment needs was seen in 18-, 19-, 30-, and 24-year-old people. The improvement of the oral cavity hygiene (TN1) was required by 9.45%, with 8.89% of women and 10.71% of men, the least in 24-year-old subjects, the most in 30-year-old ones. The second category of needs (TN2) concerned the largest number of the examined students (65.27%), mostly aged 22 and 32 years. The lower percentage of students requiring dental deposits removal was observed in women than in men. The complex treatment of parodontium (TN3) was needed by 0.66% of the examined group, 2 women and 1 man, aged 23, 24, and 27 years. The analysis showed significant statistical differences between the parodontium condition and the sex and age of the examined subjects.

As the data showed, most students brushed their teeth twice a day (219 subjects) while 216 (mainly the students of The Dentistry Department) 3 times a day. The data are statistically significant.

The most frequent way of brushing teeth was the use of fixed movements. This way was applied by 250 people, 187 preferred circular movements, 7 – sweeping ones, and 11 – horizontal movements (exclusively the students of The Medical Department). The data are statistically significant.

Most of the examined group (237) changed their toothbrushes regularly, every 3 months and 117 subjects less than every 3 months. The data are statistically significant. Toothpicks were used by 97 people, and the dental floss – 292 – most subjects were of dentistry students.

The examined students were susceptible to stress. It concerned 249 people. The data are statistically significant. Most of them did not smoke cigarettes (360), and 5 people smoked 1 cigarette a day. Ten cigarettes a day were smoked by 90 people. The data are statistically significant. Sweets were consumed by 223 people every several day and only 9 did not eat sweets at al.

Discussion

Parodontopathy occurs as a consequence of disorders of balance between potentially pathogenic microorganisms in parodontium pockets and local or systemic immune mechanisms of the host [5]. The role and importance of the parodontium are understandable if we consider that the damage of this part of the mastication organ can lead to dentition loss. Poor hygiene of the oral cavity, smoking, stress, malnutrition, acquired general diseases are the factors that undergo the control. There are also factors that are not under control, like age, sex, heredity, and the race. Those factors are not the cause of the disease however, they can cause higher susceptibility to an early or more severe course of the disease.

It was known already in the early 1970s that the cause of parodontopathy is a bacterial plaque [6], which can damage host's tissues directly or through inflammatory mediators. The students of The Dentistry Department were more aware of the negative effect of dental plaque on dentition and parodontium than the students of The Medical Department.

Smoking is one of the most important risk factors in parodontopathy. It is strictly connected with the advancement of the disease, the number of teeth lost, periodontopathy recurrence, as well as worse outcome of the treatment. According to Górska [7], there are three basic mechanisms of harmful effect of tobacco on parodontium: direct damage of parodontium tissues, healing process delay, and immune mechanism disorder. Our study also showed that coexisting smoking damages parodontium condition. Calculus and pathological pockets were stated in smokers more frequently.

The importance of stress in pathomechanism of parodontopathy may be connected with hygienic habits neglect, malnutrition, and frequent smoking in the period of psychic tension [7]. Stress can modulate the immune and inflammatory response, through the increase in corticosteroid levels as well as reduce gingival perfusion. The study confirmed the negative effect of stress on the oral cavity hygiene.

According to Konopka, it is difficult to investigate the role of the diet in isolation from other environmental factors affecting parodontium. However, malnutrition, including micro- and

macroelement and vitamins deprived diets influences interaction between bacteria pathogenic for parodontium and host's immune reaction [5]. A high-carbohydrate diet affects directly supragingival dental plaque occurrence and phagocytic activity of neutrophil granulocytes. Therefore the students were asked how often they consume sweets as they influence the amount and composition of the plaque. The majority of the medical students consumes sweets rarely thus this factor is hardly to be taken into consideration in our studies.

Other studies revealed that men are more predisposed to parodontopathy than women. Górska suggests the connection with poorer oral cavity hygiene, higher susceptibility to addictions, and seldom appointments at the dentist's [1]. Our study also presented better results as far as women are concerned. Genetic risk factors may modify host's immune and inflammatory response, which enhance pathogenic potential of dental plaque and lead to parodontopathy. A proper genotype conditions susceptibility and resistance to the development of parodontopathy. Patients with a positive genotype are prone to have larger progression of parodontium tissue damage under the influence of bacterial plaque. However, such studies require the use of appropriate genetic tests.

The examination of parodontium condition of the students of The Medical University of Białystok were also carried out in 1991 and 1995 [8,9]. The former revealed 39.9% of healthy parodontium in the examined group and gingivorrhoea and calculus – in 59.15%. Only one person (a male-fifth-year-student of the Dentistry Department) had CPI=3. The latter study, concerning the students of The Dentistry Department, showed healthy parodontium in 49.5% of the examined group, gingivorrhoea in 20.0%, gingivorrhoea and calculus in 24%, and pathological pockets of 3.5-5.5 mm in depth – in 6.5%. The condition of parodontium of the students in 1991 was definitely worse than that of 1995 and 2001.

On the basis of the results it can be said that the parodontium condition of the students is satisfactory, however, requiring hygiene improvement and dental deposits removal. It seems that the young age of the group has an impact on the results.

Conclusions

The diagnosis of parodontopathy and recognition of harmful factors affecting parodontium tissues in young people is a superior criterion in fight with irreversible changes in adult parodontium.

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Effect of fluoride preparations on the activity of human salivary cathepsin C

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Abstract

Preparations containing organic and inorganic fluorine compounds are used for oral hygiene. Fluoride ions contained in these preparations display high bioactivity and can alter the environment of the mouth.

The aim of the study was to determine the effect of preparations containing aminofluorides, commonly used in oral hygiene, on the activity of salivary cathepsin C (EC 3.4.14.1). The research material included mixed saliva, collected at rest before and after the application of the following preparations: Elmex gelee, Elmex red fluid, Elmex green fluid, Fluormex rinse. The salivary pH, concentration of fluoride ions and activity of cathepsin C were determined.

Fluoride preparations inhibit the activity of cathepsin C and cause changes in human salivary pH. Saliva can serve as a diagnostic material in the examination of the environmental exposure to fluorides.

Key words: fluoride, saliva, cathepsin C.

Introduction

Regular provision of fluoride ions to the environment of the mouth promotes remineralization of early enamel lesions and inhibits demineralization and growth of cariogenic bacteria [1]. Commonly available preparations for caries prevention contain different amounts of aminofluorides and are applied in the form of mouth-rinse or gel. Aminofluorides, being organic fluorides, have a better clinical effect compared to inorganic fluorine compounds, due to specific molecular structure. The aminofluoride molecule is composed of a fluoride ion bound to the organic amine of fatty acid, which is a hydrophilic polar molecule [2]. Because of its polar structure, the fluoride ion is actively distributed and stored on tissue surface, contrary to NaF which penetrates tissues in the passive way. This is accompanied by the origin of calcium fluoride, which serves as the reserve of long-lasting release of fluoride ion to the environment of the mouth [3].

Besides, aminofluorides exert an antibacterial effect via inhibition of bacterial metabolism in dental plaque, which is a pathogenic factor in the mouth [4]. Inhibition of the activity of a number of enzymes, including the cellular ones, is one of the mechanisms of fluoride action [5].

In the inflammatory processes in the mouth, lysosomal proteolytic enzymes are released, acting as a pathogenic factor in a number of diseases. One of them is cathepsin C (dipeptidylpeptidase I), an exopeptidase, separating dipeptides from the N-end of polypeptides and proteins [6]. It has been found to have transferase properties [7].

The aim of the study was to determine the effect of preparations containing aminofluorides, commonly used in oral hygiene, on the activity of salivary cathepsin C.

Material and methods

Material for analyses contained mixed saliva samples collected at rest, directly into test tubes (Z PS type, Medlab) at least 2 hours after meal from 49 healthy non-smoking and caries-free subjects, aged 19-24 (30 women and 19 men). They were divided into 4 groups, each group receiving different preparation. Saliva was collected before the preparation was applied after rinsing the mouth with distilled water and following a single use of the preparation. A pH/ionometer CPI-501 ELMETRON was used

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Table 1. **Mean values of the parameters analysed in overall research material**

	Elmex gelee (120 ppm Olaflur+Dektaflur+NaF)			**Elmex green fluid** (125 ppm Olaflur, 125 ppm KF)			**Elmex red fluid** (100 ppm Olaflur, 150 ppm NaF)			**Fluormex rinse** (200 ppm aminoF)		
	Before	After	p*	Before	After	p*	Before	After	p*	Before	After	p*
pH	7.03 ±0.57	7.35 ±0.32	0.126	6.85 ±0.36	7.23 ±0.46	0.004	6.97 ±0.37	7.10 ±0.24	0.164	7.05 ±0.03	7.23 ±0.29	0.245
[F^-] mg/dm^3	2.05 ±2.77	192.65 ±112.29	0.002**	1.63 ±1.5	44.0 ±23.34	0.002*	0.00	34.65 ±18.08	0.002*	0.00	55.57 ±15.18	0.063**
Protein mg/ml	1.07 ±0.23	1.09 ±0.21	0.821	0.37 ±0.22	0.29 ±0.12	0.072	0.66 ±0.23	0.8 ±0.18	0.002	0.82 ±0.16	0.87 ±0.2	0.686
Cathepsin C; pNA nmol/ml	138.81 ±81.87	78.46 ±59.47	0.004	127.7 ±116.2	35.0 ±35.74	0.019	77.28 ±74.22	43.89 ±34.45	0.044	66.78 ±72.73	40.26 ±28.95	0.459

* p value of Student's t-test for dependent variables
** sign test for dependent variables was used due to a lack of normal distrubution of variables

to determine salivary pH, a fluoride ionoselective electrode was employed to assess fluoride concentration, Gly-Phe-pNA substrate to detect cathepsin C (EC 3.4.14.1) [8] and Bradford's method to evaluate protein content [9]. The enzyme activity was measured by assessing the amount of released p-nitoaniline and expressed in nmol/ml [10]. The following preparations containing fluorides were used: Elmex gelee, Elmex green fluid, Elmex red fluid, Fluormex rinse. The results were subjected to statistical analysis using Statistica programme 6.0, StatSoft. Normality of distribution of the respective variables was determined with Kolmogorow-Smirnow test. To compare mean values of the respective parameters, Student's t-test was employed for dependent variables in the case of normal distribution parameters and a non-parametric sign test for dependent variables in the case of abnormal distribution parameters.

Results

Tab. 1 presents a list of mean values of the parameters after the use of aminofluoride-containing preparations. As no significant differences were noted in the parameters between women and men, gender was not the criterion.

The application of fluoride preparations caused an increase in salivary pH, which was the highest after the use of Elmex green fluid (0.38) and Elmex gelee (0.32). In all study subjects after the application, the concentration of fluoride ions increased proportionally to their levels in the preparation applied. In the case of Elmex gelee, the fluoride concentration was the highest and increased statistically significantly, from 2.05 mg/dm^3 to 192.65 mg/dm^3. The activity of cathepsin C, after the application of aminofluoride preparations, was decreased significantly in the case of Elmex green fluid (72.6%). The other preparations caused a smaller reduction in the activity of the enzyme, being 43.5% for Elmex gelee, 43.2% for Elmex red fluid and 39.7% for Fluormex rinse. The differences were statistically significant in all the cases, except for Fluormex rinse. Protein content was decreased only after the application of Elmex green fluid, but it was not a statistically significant difference.

Discussion

Biotoxicity of fluoride ions results mainly from their inhibitory effect on the activity of many enzymes, mostly oxidoreductases, transferases, hydrolases, Krebs cycle enzymes as well as those which lead to ATP production and synthesize protein and DNA [11-14]. This is associated with high chemical activity of F ion and its affinity to Ca^+ and Mg^+, which catalyze a number of enzymatic reactions. The environmental pH is of key importance for the activity of fluoride ions, which increases in the acid environment. In the present study, a slight increase in pH was found for each preparation. These results are convergent with the findings reported by other authors [15]. The studies on the relationship between periodontal diseases and the presence of proteolytic enzymes in the mouth may help elucidate the complex underlying mechanism of these diseases. These enzymes are involved in tissue degradation, by damaging collagen, elastin and fibronectin [16]. High activity of cathepsin B and L has been demonstrated in gingival tissue homogenates in periodontitis patients. Similar correlation has been found for cathepsin D [17-19].

The activity of salivary cathepsin C is most inhibited after the application of Elmex green fluid, even though the preparation contains a smaller amount of fluorides than the other preparations. The inhibitory effect of oral hygiene preparations on proteolytic enzymes in the saliva was found in *in vitro* studies, which revealed a decrease in the activity of human salivary cathepsin D in the presence of various concentrations of Blend-a-med toothpaste [20]. The inhibition of the activity of proteolytic enzymes after the application of various oral hygiene preparations may slow down the inflammatory processes in soft tissues.

Conclusions

1. Fluorides contained in oral hygiene preparations cause a reduction in the activity of cathepsin C and increase salivary pH.

2. Saliva can serve as a diagnostic material in the examination of the environmental exposure to fluorides.

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Educational and nursing problems of parents of children with stoma

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Abstract

In children, it is usually one of the stages of treatment of lower alimentary congenital defects. Such patients require long-term professional medical and nursing attention as well as solicitous care of the parents at home. The aim of the study was the analysis of educational and nursing problems that are faced by parents of children with stoma, the influence of a nurse on the quality of their care, and determination of nurse educational assignment in preparing the parents for the care at home. The study was performed in the group of 30 parents of children, 0-2 years old, with lower alimentary congenital defects who had intestinal stoma inserted in 2003. The questionnaire revealed that the main causes of the stoma were Hirschsprung disease (40%), anal atresia (37%), perianal fistula, intestinal perforation and necrosis (10% each). All responders stated that the knowledge acquired in the ward was of great help while nursing a child at home. The results showed that above 80% of parents had the opportunity to change the stomal sacks by themselves, once or more times, in the presence of medical staff. Skin changes (33%) were the most common complications in case of stoma, which could encounter for inappropriate care. Other complications included hemorrhage (20%), prolapse (13%), and stoma narrowing (10%).

Key words: stoma, nursing, child.

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Introduction

The intestinal stoma is a purposeful connection of the large or small intestine and the surface of the abdominal integuments. An emerged stoma is situated in the frontal wall of the abdomen, seen as a vivid red cone of the intestinal mucous membrane, protruding in the abdomen integuments [1]. In children, it is usually one of the stages of treatment of lower alimentary congenital defects. Medical staff plays an important role in preparing parents for taking care of their children. The main task of the medical personnel is to arouse a feeling of co-responsibility for the health of the child and active participation in the process of care. Parents should know how to deal with the stoma, change stomal sacks, communicate with the child and cope with problems of everyday life. It is very important to determine the level of parents awareness, their needs in order to help them. Parents' motivation, argumentation, abilities to learn and transfer information are also essential [2].

The aim of the study was the analysis of educational and nursing problems of the parents of children with stoma, parents' emotional problems, and the influence of a nurse on the nursing process.

Material and methods

The study group consisted of 30 parents (67% of women and 33% of men), aged 20-50, of children at the age up to 2 years old with the emerged intestinal stoma, hospitalized or ambulatory treated in Białystok, Warsaw, and Poznań in 2003. The questionnaire containing 30 questions concerning educational and nursing problems was the examination tool. The results were analyzed statistically, interdependences were considered significant at $p<0.05$. The graphic analysis was performed in Excel program.

Figure 1. **The causes of stoma formation**

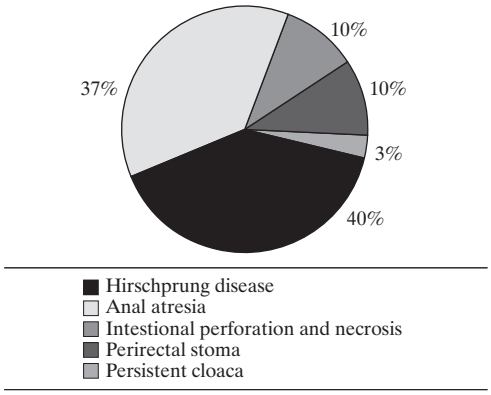


Figure 2. **Parental education and understanding the information on stoma care**

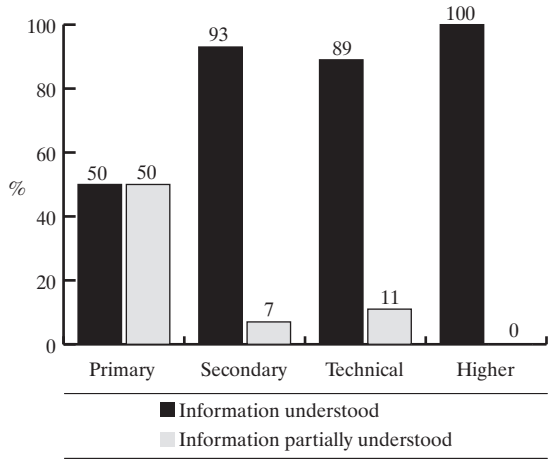


Figure 3. **Parental age and understanding the information on stoma care**

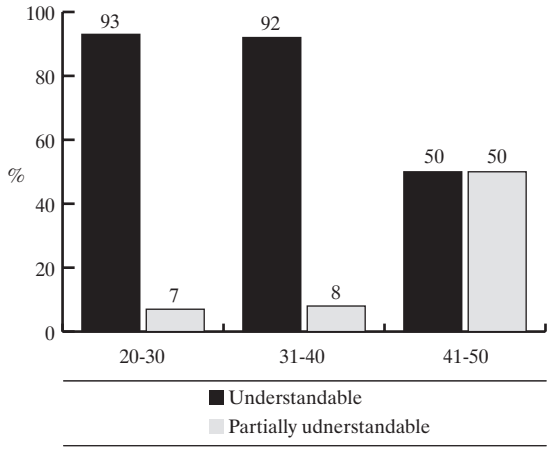
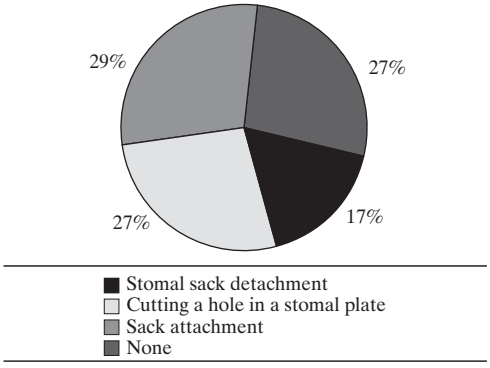


Figure 4. **Most problematic activities connected with stomal management**

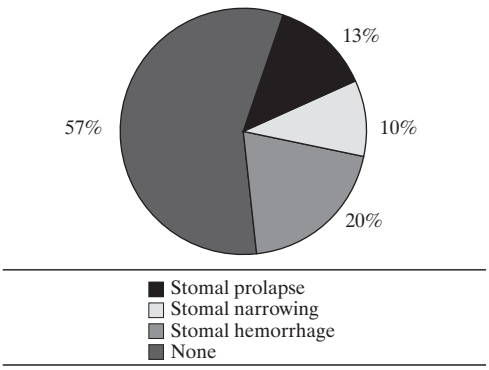


Results

The parents 20-30 years old comprised 50% of the study group, 43% were 31-40 years old, 41-50 years old constituted 7% of parents. The majority of parents finished secondary schools (49%), 29% – technical schools, and 16% of parents graduated from higher education schools. The main causes of the stoma were Hirschsprung disease (40%) and anal atresia (37%) (*Fig. 1*). The mean time of stoma at place was about 1.5 years. It turned out that 93% of parents were informed of the necessity of stoma in their children, whereas 7% did not obtain any information about it. However, all the parents were instructed how to take care of a child with a stoma. Adequate information was obtained by 53% of the responders in the first 24 hours after the operation, 40% – before discharging, and 7% – before the operation. More than 80% of parents claimed the information given by a nurse was understandable, whereas only 17% did not fully understand the message. Thus, the correlation was found between the level of education of the parents and the range of information they understood; the more educated the parents were, the more they understood (*Fig. 2*). It was also revealed that understanding was related to the age. The younger responders (20-30 years), were the more they (93%) understood the nurse's instructions. The oldest group of responders (41-50 years old) understood the instructions only in 50% (*Fig. 3*). All responders claimed the information they were given by the nurse helped them to take care of their children at home. The data presented that more than 80% of parents changed the stomal sacks in the ward in the presence of the nurse. Out of this group, 67% of responders changed the sacks several times. Only 20% of the parents maintained that they were not allowed to change the stomal sacks in the ward.

The examination showed that dealing with stomal sacks could be difficult for parents. Only 27% of responders did not have any problem with the sacks, where as 30% found it difficult to cut the hole in the stomal plate and accurately apply the stomal sack to the abdominal integuments (*Fig. 4*). More than a half of responders (53%) changed the stomal sacks once a day (in accordance with the instructions) and they could do with the number of sacks they had per month. However, 47% changed them several times a day and they did not have enough sacks per month. The skin changes around the stoma and the causes of

Figure 5. **Stomal complications in children**



their occurrence were evaluated. There were 67% of responders who did not report any changes of the skin around the stoma, which could be evidence of a proper care. The cause of skin changes was improper protection of the stoma (80% of responders) or allergy to stomal plate (20%). Those who confirmed the occurrence of skin changes in their children comprised 33%. There were other complications concerning the stoma itself occurring in 40% of children; 20% revealed hemorrhage from the stoma, 10% – the stoma narrowing, and 13% – prolapse of the stoma (*Fig. 5*). The sacks should be changed once a day, in the evening after the bath, which does not provoke any stressful situation and is treated as a part of nursing activities and most parents (86%) confirmed that the children were calm during the change. The frequency of stomal change and its causes were analyzed and the issue of a month limit of the sacks was considered. Almost a half of responders (47%) said they changed the stomal sacks several times a day, which led to the sack depletion. The rest (53%) changed them once a day, i.e. in accordance with the instructions and the number of stomal sacks for this group was satisfactory. The main cause of excessive use of the sacks was, according to more than 60% of responders, the leakage of intestinal contents under the plate. However, the rest of parents sought the cause in inability to use the sacks properly. Thus, the difficulties in coping with stomal equipment are due to insufficient practice. Another issue was the analysis of factors influencing the improvement of parental care at home. According to 50% of responders, the number of stomal sacks should be increased, whereas 30% claim that parents' training is more important. Moreover, the responders thought that meetings and the exchange of information among the parents of children with stoma could be profitable and helpful.

Discussion

Stoma formation in children is usually a part of the treatment of lower alimentary tract congenital diseases. Such children require long-term, professional medical care, increased supervision and abilities of the parents [3]. The main causes of the stoma were Hirschsprung disease (40%) and anal atresia (37%). Perforation and intestinal necrosis were observed in 10%. The issues of educational and nursing problems were touched upon in the study. Similar studies were performed in Bydgoszcz in 5 children with temporal stoma (with low birth weight) due to necrotic intestinal inflammation [4]. The mean duration time of stoma in children in study groups was similar and continued for about 1.5 years. It depended on many factors, such as body weight and health condition. Introducing the knowledge on the subject and conveying the instructions in a suitable way are a crucial issue concerning confidence in the medical staff and parents' anxiety. Rybakowa et al. points to a well prepared conversation with parents as an important solution for both sides [5]. Parents have the right to co-decide about the process of the diagnosis and treatment of their children as soon as they are taken to hospital [6]. The duty of the nurse is to prepare the parents for their care of the child at home, give as much information as she can about the stoma and its management. Adequate information was obtained by 53% of responders in the first 24 hours after the operation, 40% – before discharging. Barczykowska et al. claimed that parents should be prepared for taking care of their children as soon as possible but gradually. Thus, the nurse should give theoretical details as well as practical ones concerning the stoma operation and skin management [4]. The level of understanding depends on the parents' education and age. Our study confirms this dependence, as 50% of the study group with primary education did not follow the instructions. As far as the age is concerned, the younger group did not have any problem with understanding the information conveyed by the nurse. Thus, there is a necessity of choosing appropriate forms and didactic methods for particular groups of parents. According to Święcka et al. parents expect honest and accessible information concerning both the health condition of a child and the management of the stomal equipment. It was revealed that 97.8% of parents required instructions on the child's hygiene, its activities and nutrition. It proved that 95% of parents have confidence in the nurse's knowledge and help [7]. Trojanowska et al. conducted a similar study, however, not limited to a particular disease. According to their investigations, 51.5% of parents maintained that information concerning nursing the child was satisfactory but only to a certain extend. A positive answer was given by 42.4% of responders [3]. It is essential to gain knowledge and skills to nurse a child at home. Święcka maintains that it is also important to explain the purpose and pattern of all actions taken for the child [7]. Barczykowska et al. proved how crucial it was to learn to change the stomal equipment in the ward for nursing a child at home [4]. Hemorrhage from intestinal mucous membrane or prolapse of the stoma, solved by the parents by themselves, were among complications observed by responders. Only 10% concerned the narrowing of intestinal stomas. There are numerous studies conducted by both pediatric and adult surgeons that describe stomal narrowing as a result of inflammation around the stoma. Such a condition can require repeated surgical intervention. Sawicz-Birkowska analyzed early and late complications in children hospitalized. She observed operational wound dehiscence and marginal necrosis of the emerged intestinal wall in 14.8% of neonates with emerged colostomas. Among late complications, 27.79%

revealed: intestinal mucous membrane prolapse, infection and maceration of the skin around the stoma, and stomal narrowing [8]. Snarska, and other surgeons stated in their studies that properly established stoma guaranteed its good functioning and prevented complications [1].

The study confirms that parents' education plays an essential role in managing children with stoma at home. A textbook "Nursing the stomas in children" can be helpful in this process and can facilitate it.

Conclusions

1. Learning practical skills to nurse a child with stoma is very important in managing the child at home.
2. Understanding of information given by a nurse depends on the age and education of parents.
3. The quality of home care can be improved by increasing the number of training sessions and meetings of parents of children with stoma and increasing the limit of stomal sacks.

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Physical efficiency of 10-16 years old boys with hearing impairment

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Abstract

Purpose: **The aim of our investigation was to estimate on hand of the above the physical efficiency value of hearing impaired children and compare them with healthy counterparts.**

Material and methods: **The investigation covered a group of 63 boys, 27 with hearing impairment (HI) and 36 healthy (R), 10-16 years old. The investigated subjects were divided into 2 groups according to their age: 10-12 and 14-16 years old boys. For determination of cardio-respiratory system efficiency PWC_{170} (Physical Working Capacity) test was performed. PWC_{170} and VO_2max indices were calculated using proper mathematical equations.**

Results: **The comparison of PWC_{170} and VO_2max indices shows no statistically significant differences between investigated groups. Boys from younger HI group obtained higher PWC_{170} and VO_2max values than boys from R group. In older groups, values of investigated indices were inversed in relation to younger groups. Boys from R group obtained higher values of investigated indices.**

Conclusions: **Results received shows some trend, which is probably connected with isolation and absence of cohesion between auditory organ rehabilitation and physical efficiency development. There is necessity of integration programs construction, which will influence on comprehensive and proper growth of hearing impaired children.**

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Key words: hearing impaired children, PWC_{170}, VO_2max, physical efficiency.

Introduction

The estimation of children's cardio-respiratory system efficiency may be useful in children's growth controlling. As the most valuable index assessing cardio-respiratory efficiency the maximal oxygen uptake potential (VO_2max) is accepted. Also, this index is commonly used in physical efficiency evaluation [1-3].

Many authors describe correlations between VO_2max and various factors, for example: with body composition (especially with amount of active tissue – muscles) [4,5], specific influence of physical training [6], environmental contamination [7-9], life style etc. [8].

Physical efficiency of children from different inhabited areas, children of various physical activity status, and training different sport disciplines were widely investigated. However, there are few comparison studies between healthy children and those with hearing impairment [10,11]. The essence of rehabilitation processes, first of all, is reinstatement of normal functioning during usual day activities, while less attention is give for sport physical efficiency formation. The motor and physiological efficiency evaluation is fundamental in sport training planning.

The main purpose of our study was to measure cardio-respiratory efficiency and physiological performance level of children with hearing impairment, and then compare with a group of healthy children. This aim was realized based on VO_2max and work capacity values calculated from PWC_{170} test.

Material and methods

The investigation covered a group of 27 boys with hearing impairment from "School for hard-of-hearing and deaf children" in Racibórz. As a reference group 36 healthy boys from

Table 1. **Somatic characteristics of investigated boys groups**

Age group	10-12 years old boys		14-16 years old boys	
Groups	Hearing-impaired children	Healthy children	Hearing-impaired children	Healthy children
Number of investigated persons	11	16	16	20
Age [years]	11.2±0.3	11.5±0.5	14.8±0.9	15±0.7
Body weight [kg]	40.3±4.2	39.9±7.3	56.9±17.8	65.5±12.7
Body height [cm]	146.1±2.9	145.4±4.7	166±10.3	173.3±6.6

* statistically significant differences, $p < 0.05$

Racibórz city were investigated. The investigated subjects were divided into 2 groups according to their age: 10-12 and 14-16 years old boys (*Tab. 1*).

For determination of cardio-respiratory system efficiency PWC_{170} test was performed on cycle ergometer 839E (Monark Exercise AB, Sweden), accordingly to method described by Halicka-Ambroziak [12]. The test was consist of two 5 minutes cycling periods with different loads (25 W and 50 W for younger, and 50 W and 75 W for older group). During the test heart rate was continuously monitored with Polar 810s (PolarElectro, Finland). PWC_{170} index was calculated using proper mathematical equation:

$$PWC_{170} = N_1 + (N_2 - N_1) \cdot \frac{170 - f_1}{f_2 - f_1}$$

where:
N_1 – load during first cycling period, N_2 – load during second cycling period, f_1 – mean heart rate in last minute of first cycling period, f_2 – mean heart rate in last minute of second cycling period

For physical efficiency estimation maximum oxygen uptake (VO_2max) was calculated using proper mathematical equation:

$$VO_2max = 1{,}7 \cdot PWC_{170} + 1240$$

Additionally, PWC_{170} and VO_2max indices were calculated per body weight in kilograms.

For calculation of statistically significant differences between groups the non-parametric U Mann-Whitney test was used (Statistica 6.0, StatSoft, USA). Values of $p < 0.05$ were considered as statistically significant differences. Ethical approval was given by The Wrocław University Shool of Physical Education Research Ethics Committee. Additionally, parents of the boys gave consent for the investigation.

Results

The comparison of PWC_{170} and VO_2max indices shows no statistically significant differences between investigated groups. Boys from younger with hearing impairment group obtained higher PWC_{170} and VO_2max values than boys from healthy group. On this basis we can assume, in this age group, that hearing-impaired boys are characterized by insignificantly better cardio-respiratory efficiency and physical performance than healthy boys (*Tab. 2*).

Table 2. **Comparison of investigated indices characterizing cardio-respiratory and physical efficiency of investigated 10-12 and 14-16 years old boys**

Parameter	10-12 years old boys	
	Hearing-impaired children n=11	Healthy children n=16
PWC_{170} [W]	95.1±41.4	75.9±34.4
PWC_{170} [W*kg^{-1}]	2.3±1.1	1.9±0.6
VO_2max [ml*min^{-1}]	1401.7±70.4	1369±59.4
VO_2max [ml*min^{-1}*kg^{-1}]	33.8±4.9	35.1±5.2
Parameter	**14-16 years old boys**	
	Hearing-impaired children n=16	Healthy children n=20
PWC_{170} [W]	127.8±46.5	156.3±71.9
PWC_{170} [W*kg^{-1}]	2.3±0.8	2.4±1.0
VO_2max [ml*min^{-1}]	1457.3±79	1505.7±122.3
VO_2max [ml*min^{-1}*kg^{-1}]	27.1±4.2	26±3.5

* statistically significant differences, $p < 0.05$

In older groups, values of investigated indices were inversely related to younger groups. Boys from healthy group obtained higher values of investigated indices (*Tab. 2*). Differences in values of investigated indices were statistically insignificant in older group. However, these results indicated that 14-16 years old boys with hearing impairment have less efficient cardio-respiratory system and worse physical performance than healthy boys.

Discussion

Hearing-impaired persons are frequently recognized as ill. Their handicap is not only seen as disability, but also as a complex morbid process. One can observe such behavior especially towards children, which are isolated from their healthy counterparts, particularly in physical effort sphere. Younger children with hearing impairment, similarly to children in their age, are characterized by enormous, spontaneous movement activity. They are simply curious about the world around them [13]. Therefore, there were no statistically significant differences in cardio-respiratory and physical efficiency between hearing impaired and healthy children.

In case of 14-16 years old boys, children with auditory sense damage obtained lower values of investigated indices describing cardio-respiratory and physical efficiency than their healthy counterparts. Probably, this can be induced by some kind of "shame" related with communication problems and natural isolation which occur when youth grow up. Persons with hearing impairment often have less possibility to participate in physical activities. Because of the communication improvement lessons are frequently emphasized in schools for hard-of-hearing and deaf children, slighter stress is laid on physical efficiency development. Specific society will be incommode and limit free

evolution, destroy creativeness, force strict moral system and often induce fear of "foreignness". Isolated lessons of physical education in schools for hard-of-hearing and deaf children may reduce individuality and physical efficiency of these children [14]. Therefore, there is necessity of integration programs construction, which will influence on comprehensive and proper growth of hearing-impaired children [15,16].

Conclusions

1. There are no statistically significant differences in cardio-respiratory and physical efficiency, evaluated on the basis of PWC_{170} and VO_2max indices, between 10-12 and 14-16 years old children with hearing impairment and their healthy counterparts.

2. Children with hearing impairment from 14-16 years old group are characterized by lower values describing cardio-respiratory and physical efficiency than healthy children. Nevertheless this are statistically insignificant differences, one may observed some trend, which is probably connected with isolation and absence of cohesion between auditory organ rehabilitation and physical efficiency development.

3. School program for hearing-impaired children should include integrated form of education, including physical education lessons.

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The evaluation of the functioning and of the quality of life of patients with Rheumatoid Arthritis

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Abstract

Purpose: **It has been reported that Rheumatoid Arthritis (RA) affects 0.5-1% of the adult population in Poland. The condition is two or three times more common among women than among men. The majority of the onsets of disease occur between the ages of 40 and 60.**

The aim of this study was to assess the functioning and quality of life of patients with Rheumatoid Arthritis treated in Rheumatoid Special Clinic in Poznań, Poland.

The specific question was: does the functioning and the quality of life of RA patients depend on demographic variables (gender and age) and duration of the disease?

Material and methods: **The study sample consisted of 168 RA patients, including 123 women (73.2%) and 45 men (26.8%). To assess the functioning and the quality of life the Polish version of the Arthritis Impact Measurement Scales 2 (AIMS 2) was applied [3]. The Arthritis Impact Measurement Scales 2 was translated into Polish according to standardized approach (internal consistency reliability for the global score, alpha = 0.78).**

AIMS 2 scores range from 0-10, with 0 representing high functioning and quality of life, 10 representing poor functioning and quality of life.

Results: **The results showed that the mean scores on the AIMS 2 for physical state and mobility was 3.53, which is within the medium section of the average measurement of the quality of life. The quality of life depended on the sex of the patients. Women scored significantly lower in the emotional area than men. Youngest patients demonstrated higher evaluation of quality of life in the area of bending and walking (4.4). Life satisfaction of people with RA is higher among the patients suffering longer than 5 years.**

Key words: functioning, quality of life, arthritis rheumatoid.

Introduction

It has been reported that Rheumatoid Arthritis (RA) affects 0.5-1% of the adult population in Poland. The condition is two or three times more common among women than among men. The majority of the onsets of disease occur between the ages of 40 and 60 [1-3].

Important goals of health care for patients with Rheumatoid Arthritis are to minimize functional loss maintain independence and preserve quality of life. In the past decade, health status instruments have proven to be valuable, relevant and outcome measures in both clinical trials and clinical practice. Questionnaires based on health status variables, such as mobility, mood and social interaction, are particularly relevant because they assess the aspects of that most concern the individual patient. Generic health status instruments can be used to compare patients with different diseases. Since important areas for specific patient groups may either be omitted or only superficially covered, disease specific instruments have also appeared for arthritis patients [2,4,5].

The aim of this study was to assess the functioning and quality of life of patients with Rheumatoid Arthritis treated in Rheumatoid Special Clinic in Poznań, Poland.

The specific question was: does the functioning and the quality of life of RA patients depend on demographic variables (gender and age) and duration of the disease?

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Table 1. **Functioning and quality of life of Rheumatoid Arthritis patients (Arthritis Impact Measurement Scales 2) n=168**

AIMS 2 *	Mean	SD
Physical state and mobility:	3.53	1.91
physical activity (mobility)	2.98	2.21
walking and bending	5.79	2.44
functioning of hands and fingers	4.28	2.44
functioning of arm	2.88	2.46
self-care tasks	2.68	2.58
household tasks	2.55	2.48
Emotional state:	4.66	1.41
level of emotional tension	5.25	1.51
mood	4.07	1.63
life satisfaction	5.02	1.83
State of social functioning:	3.57	1.44
social activity	5.54	1.65
support of family and friends	1.60	1.99
work	4.08	2.21
arthritis pain	7.08	1.97

SD – standard deviation
* score range 0-10; 0 – high quality of life, 10 – poor quality of life

Material and methods

The study sample consisted of 168 RA patients, including 123 women (73.2%) and 45 men (26.8%). The mean age (years) of the treated women was 51.34±12.82, for men 55.84±10.96 and 52.54±12.47 for the whole group. The mean duration of the disease in women was 12.88±8.91 in men 11.33±8.30 for the whole group 12.48±8.75. To assess the functioning and the quality of life the Polish version of the Arthritis Impact Measurement Scales 2 (AIMS 2) was applied. The Arthritis Impact Measurement Scales 2 [6,7] was translated into Polish according to standardized approach (internal consistency reliability for the global score alpha =0.78).

AIMS 2 scores range from 0-10, with 0 representing high functioning and quality of life, 10 representing poor functioning and quality of life.

AIMS 2 is an independent multi-dimensional scale of assessment consisting of two parts.

Results

The assessment of the quality of life using the AIMS 2 scale. This is shown in *Tab. 1*.

The lowest mean result referred to the subscale: Physical state and mobility related to household tasks at 2.55, where the highest result was in the subscale walking and bending (5.79). The emotional state is evaluated on the basis of average values for the measures of emotional tension and mood. The assessment of the emotional state and life satisfaction represent medium values. The lowest average in the subscale was in the assessment of mood at 4.07. The highest score was for the subscales: level of emotional tension (5.25), life satisfaction (5.02). The next category of assessment was the area of social functioning in reference to social activity, support of family and friends and the work done. The lowest average result was in the subscale of social support (1.6), *Tab. 2*.

It was followed by the presentation of the relation between the age and quality of life. This relation was analyzed in three age groups: under 39 years, 40-59, over 60 years, *Tab. 3*.

Kruskal-Wallis' test indicates a major difference in the evaluation of the quality of life in reference to walking and bending between the age group under 39 years and 40-59 years. The next question in the study was: does the quality of life of RA patients depend on duration of the disease. Using the non-parametric U-Mann-Whiney's test the comparison was carried out of the quality of life of people whose RA lasts less than 5 years with those with condition lasting more than 5 years.

In the assessment of life satisfaction a major statistical difference was reported (level of importance $p<0.05$) between the groups.

People who have been suffering from the condition longer report higher assessments of life satisfaction. This fact is related to the processes of the chronic adaptation.

Discussion

The analysis of the quality of life of people suffering from RA, taking into account demographic indicators (gender and age), showed that sex of the patients interviewed influences the assessment of the quality of life in the area of emotional state.

Women showed lower quality of life in the area of emotional state than men. A statistical relevance with the level of importance was reported by Zaphiroponlos and co-authors [8-10]. In their work assess the emotional state of people with RA as far as their level of anxiety, emotional tension and depressive reaction are concerned. They report more common presence of these symptoms among women than among men.

Meenan and co-authors [11-13] did not show any influence of the sex on the assessment of functioning within the particular areas in AIMS 2 scale, claiming the sex does not determine the quality of life of the patients. The analysis of the quality of life with reference to the age indicated a statistical relation between the assessment of the quality of life by patients under 39 and patients over 60 and even more in the area of physical state and mobility. The interviewed patients over 60 years old assessed their quality of life in the area of physical state and mobility lower than the patients under 39. The conclusion supports the results of research by Sherrer and co-authors [14] who describe the influence of the older age of patients with RA on physical limitations and lower efficiency in dealing with household tasks, or carrying out tasks related to self-care. It was showed that people suffering from the condition for more than 5 years achieve a higher level of satisfaction than those whose disease process is shorter. Similarly, the assessment of the quality of life in the remaining areas was better for the patients suffering longer, although no statistical relevance was revealed. The conclusions Sherrer and co-authors [14] are consistent with the results of the research by Meenan and co-authors [12,13] which prove that the intensive development of RA takes

Table 2. **Gender and functioning and quality of life of Rheumatoid Arthritis patients (Arthritis Impact Measurement Scales 2)**

AIMS 2*	Women (n=123) Mean (SD)	Men (n=45) Mean (SD)	U	Z	p-value
physical activity (mobility)	3.04 (2.21)	2.81.(2.23)	2575.0	-0.689	Ns
walking and bending	5.86 (2.41)	5.61.(2.53)	2603.0	-0.589	Ns
functioning of hands and fingers	4.44 (2.35)	3.83(2.67)	2352.0	-1.488	Ns
functioning of arm	2.97 (2.47)	2.67(2.45)	2556.0	-0.756	Ns
self-care tasks	2.63 (2.51)	2.85(2.81)	2682.5	0.304	Ns
household tasks	2.64 (2.49)	2.32(2.49)	2522.0	-0.879	Ns
level of emotional tension	5.43 (1.45)	4.78(1.59)	2207.0	-2.008	p<0.05
mood	4.16 (1.67)	3.83(2.57)	2435.0	-1.191	Ns
life satisfaction	5.01 (1.79)	5.04(1.96)	2681.5	0.308	Ns
social activity	5.37 (1.62)	6.02(1.67)	2168.5	2.145	p<0.05
support of family and friends	1.44 (1.92)	2.06(2.14)	2302.5	1.665	Ns
work	3.96 (2.07)	4.38(2.57)	355.5	0.363	Ns
arthritis pain	7.15 (2.51)	6.91(1.83)	2439	-1.177	Ns

SD – standard deviation *score range 0-10 0 – high quality of life 10 – poor quality of life

Table 3. **Age and functioning and quality of life of Rheumatoid Arthritis patients (Arthritis Impact Measurement Scales 2)**

AIMS 2 *	<39 (n=27) Mean (SD)	40>59 (n=89) Mean (SD)	>60 (n=52) Mean (SD)	p-value
physical activity (mobility)	2.26 (1.90)	2.94 (2.11)	3.43 (2.44)	Ns
walking and bending	4.4 (2.24)**	6.3 (2.2)**	5.65(2.65)	p<0.001
functioning of hands and fingers	3.39 (2.0)	4.48 (2.29)	4.4 (2.82)	Ns
functioning of arm	1.89 (1.61)	3.13 (2.25)	2.99 (3.0)	Ns
self-care tasks	1.53 (1.93)*	2.68 (2.5)	3.31(2.85)*	p<0.05
household tasks	1.6 (1.85)*	2.39 (2.13)	3.34 (3.07)*	p<0.05
level of emotional tension	5.59 (1.76)	5.22 (1.45)	5.1 (1.48)	Ns
mood	3.85 (1.66)	4.13 (1.6)	4.10 (1.70)	Ns
life satisfaction	4.51 (1.84)	5.15 (1.71)	5.05 (2.0)	Ns
social activity	5.50 (1.70)	5.62 (1.45)	5.43 (1.94)	Ns
support of family and friends	1.2 (1.75)	1.56 (1.89)	1.9 (2.39)	Ns
work	4.19 (2.32)	4.20 (2.23)	3.58 (2.22)	Ns
arthritis pain	6.3 (1.75)*	7.351 (1.67)*	7.03 (2.42)	p<0.05

SD – standard deviation *score range 0-10 0 – high quality of life 10 – poor quality of life

place in the first few years of the condition and in the following years the state of health is more stabilized. This might be the reason why the suffering assesses their quality of life higher. The general assessment of the quality of life of the people suffering from RA has the average value of 3.53, which is within the medium section of the average measurement of the quality of life. Good assessment of the quality of life among RA patients is influenced by the support of family and friends and is expressed in the average value 1.60. Negative assessment of the quality of life results from the limitations in carrying out everyday activities. It is related to arthritis pain the mean score of 7.07, and for walking and bending 5.79. The assessment of the quality of life of the people with RA depends on the sex of the patient. Women scored lower in the emotional area than men. The age of the patients influences the quality of life of people with RA. Younger patients showed higher evaluation of quality of life in the area of physical state and mobility. Life satisfaction of people with RA is higher among the patients suffering longer than 5 years.

Conclusions

Further research into the quality of life can lead to improvement in the quality of care and treatment of people suffering from Rheumatoid Arthritis.

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Health behaviour-patterns among paediatric nurses, employed in medical institutions of Greater Poland

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Abstract

In the organised approach to health, a vital part is played by health education. Its main purpose is to transform populational attitudes to health and develop the sense of responsibility for it. Children constitute a particularly important populational segment in this respect.

Purpose: The aims of this study were to establish pro-health behaviour-patterns among paediatric nurses.

Material and methods: Ninety-one randomly selected nurses, employed in the Greater Poland's medical institutions were queried, through a specially designed questionnaire, on their nutritional habits, physical activity, and frequency of consulting their physician. A Microsoft Excel spread sheet was employed in performing statistical calculations, making use of such functions as sum, per cent and arithmetic mean.

Results: Almost all subjects eat irregularly. The majority of them have two meals a day, omitting breakfasts. The proportion of ingredients containing fibre in their diet is insufficient, whereas monosaccharides are consumed excessively. The physical activity is about adequate; taking strolls are the preferred form. The respondents tend to overlook the first, disturbing disease symptoms, and rarely consult with their physician.

Conclusions: 1. The life-style of paediatric nurses is not conducive to maintaining health, despite declaring the latter as the overriding life's value. 2. Chief aberrations in their health behaviour concern: irregular meals, consuming the excessive amount of monosaccharides, and preferring the passive forms of leisure. 3. In nurses' educational curriculum the role of health promotion in human life should be re-assessed, while the importance of health education in their future work should be emphasised.

Key words: health behaviour, medical personnel, health education, life-style.

Introduction

At the time of changes in thinking about health, the role of individual attitudes to that priceless value, its maintaining and strengthening, is more and more emphasised. These attitudes are most frequently expressed as health behaviour-modes, behaviour-patterns related to health or preventive activities [1]. A definition of such attitudes, allowing for the role of knowledge and its influence on maintaining health, was formulated by Puchalski: health behaviour-patterns denote the individual types of behaviour that are vitally associated with his/her health [2]. It has been proven that actions undertaken by individuals stem from their socialising experiences – primarily through interaction with the immediate social environment [3]. Taking into consideration the relationship between health and behaviour, Sęk puts forward various classification criteria of such behaviour-patterns: habits, attitude to health and health consequences, promotional and preventive behaviour-modes as well as – related to a given role – parental and medical healthy and non-healthy behaviour-patterns [4].

Behaviour-modes related to the health of children and adolescents are particularly important, as in this period of life health habits and behaviour-patterns are being shaped, influencing future health of a given individual. Life experiences of young persons, the way they undertake their developmental tasks, i.e. the life-style taking shape – impact strongly on the forming of individual's physical, psychical, and social potential. This developmental period is also characterised by considerable receptivity to external stimuli, originating in various sources.

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Table 1. **Regularity of nutrition**

Self-assessment of regularity of nutrition	No. of meals a day	Fixed times of having meals	Amount	Per cent
No	Four	No	12	13.19%
	Two	No	49	53.85%
	Five	No	3	3.30%
	It varies	No	1	1.10%
	Seven	No	1	1.10%
	Three	No	15	16.48%
			81	**89.01%**
Yes	Four	Yes	5	5.49%
	Five	Yes	3	3.30%
	Three	Yes	2	2.20%
			10	**10.99%**
Total			**91**	**100.00%**

Medical personnel, taking care of patients in this age-group, should make the most of this openness. Such activities are unlikely to succeed, however, if the personnel is itself short of basic habits, conducive to health.

Purpose

Behaviour-patterns conducive to health are, in this article, the subject of theoretical analysis and empirical study. The authors interpret them as all forms of human activity which, according to current knowledge, contribute to maintaining, strengthening, and restoring health [5].

Paediatric nurses, taking care of the youngest members of society, play a vital part in propagating the optimal health behaviour-patterns among them. As mentioned earlier, a prerequisite of effective health education is the proper life-style in those who preach it. It is even more effective if the educators not only pass the theoretical knowledge or requirements but also set the good example themselves.

Therefore, the main purpose of the study was to establish health behaviour-patterns manifested by paediatric nurses (a nurse constantly in touch with children hospital care, out-patient care), regardless of specialisation employed in medical institutions of Greater Poland.

Material and methods

A method of diagnostic opinion poll was employed. The design of the study of the subjects' behaviour-patterns was such that they themselves supplied the necessary data by means of oral or written communication, which simplified the process [6]. The specially constructed questionnaire was the study's tool. The group of respondents comprised 91 randomly selected nurses, employed in intramural and extramural medical institutions in Greater Poland. The study proper was preceded by a pilot check. A Microsoft Excel spread sheet was employed in performing statistical calculations, making use of such functions as sum, per cent and arithmetic mean.

Figure 1. **Having breakfast by nurse before leaving home in the morning**

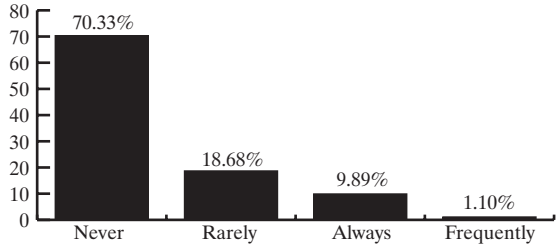


Table 2. **Nutrition – health behaviour-patterns**

Frequency of consuming	Vegetables and fruit		Milk and its products		Brown bread	
	N	Per cent	N	Per cent	N	Per cent
Everyday	23	25.27%	20	21.98%	15	16.48%
Several times a week	56	61.54%	54	59.34%	27	29.67%
Never	0	0.00%	2	2.20%	4	4.40%
Once a week	12	13.19%	14	15.38%	9	9.89%
Less than once a week	0	0.00%	1	1.10%	36	39.56%
Total	91	100.00%	91	100.00%	91	100.00%

Results

All health related behaviour-patterns can best be defined as life-style, i.e. an everyday set of diverse behaviour-modes, typical for an individual or a group [7]. The questionnaire was then divided into separate thematic sections related to actions contributing to the healthy life-style of nurses [8].

The first section concerned the quality and regularity of meals. Our data show that over 89% of the studied group eat irregularly. 53.8% have two meals a day. Diverse times of consuming meals throughout the day were also revealed. As many as 70% of the inquired nurses skip breakfasts, and 18% eat them sparsely. Frequently, or even always have breakfast only 19% of the respondents (*Tab. 1*, *Fig. 1*).

Proper nutrition concerns not only the quantity but also the quality of nutrients. 61% of the nurses declared having vegetables and fruit several times a week. A majority of them (over 70%), everyday or a few times a week drinks milk or its products. Brown bread, a rich source of fibre, is less popular (approx. 40% would have it once a week or less than that) (*Tab. 2*). The consumption of monosaccharides – a dietary error – is very popular among the respondents. Over 75% eat them every day or several times a week (*Tab. 3*).

The next set of questions concerned the physical activity and the forms of leisure. The nurses assess their physical fitness as rather sufficient (75% of responses), while the preferred forms of activity are: taking strolls (61.54%), swimming (19.78%), bicycle riding (13.19%), gymnastics (4.40%), work at garden plot (1.10%).

Most nurses prefer the passive forms of leisure (approx. 80%). This includes: watching TV, on average 2 hours and 13 minutes. This is also the approximate amount of time dedicated to rest. Other activities in the daily schedule of nurses are: professional work, house jobs, and sleep (*Fig. 2*).

Table 3. **Nutrition – anti-health behaviour-patterns**

Frequency of consuming	Sweets	
	N	Per cent
Everyday	39	42.86%
Several times a week	30	32.97%
Never	2	2.20%
Once a week	6	6.59%
Less than once a week	14	15.38%
Total	91	100.00%

Figure 2. **Nurse's daily agenda**

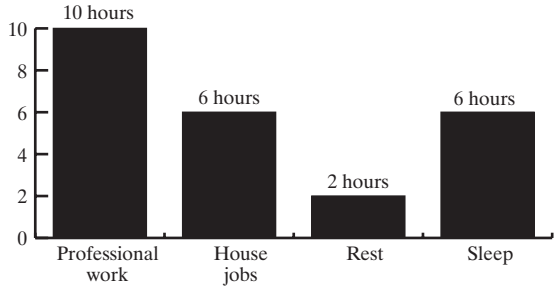
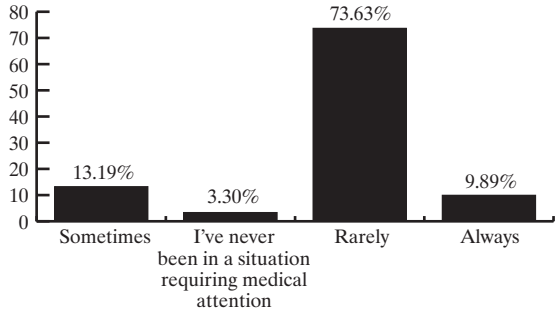


Figure 3. **Frequency of consulting a physician by nurses in health-threatening situations**



The last section comprised questions involving the frequency of consulting a physician as well as the importance of health in the minds of the nurses. The responses were preceded by a brief self-assessment of health. Almost 88% thought of themselves as "rather healthy", and 12% as "healthy". None felt ill. It is surprising in view of the fact that almost 70% of the nurses declared what can be termed as rather flippant attitude towards a healthy life-style. What's more, 74% admitted to seldom seeing their physician, even though the first, alarming symptoms of a disease might have been present (*Fig. 3*).

The group were also asked to rank, according to importance, such issues as: work, family, health, money, social contacts, and religion. Health came first, then family, work, religion, money and, the least important in the opinion of nurses, social contacts.

Discussion

Pro-health behaviour-patterns may be manifested in various spheres of human activity. The data presented concerned only some aspects of the latter – though arguably the fundamental ones. The study comprised a group of persons routinely well equipped in knowledge about health. Still, some gap between theory and practice has been revealed.

Some of the improper habits, detrimental to health, may be due to the specific, professional profile, involving shift work schemes. However, some basic mistakes as, e.g. skipping breakfast, consuming inordinate amount of sweets, instead of nutrients rich in fibre, as brown bread, fruit, vegetables as well as disregarding the prodromal disease symptoms – all require considerable adjustment. It is encouraging, however, that despite some carelessness shown towards one's health, it still constitutes the overriding value, among the studied professional group.

A similar research among nurses was conducted in Kraków in 1997 [9]. Despite the passage of time, and the hoped-for increase in knowledge on factors influencing health, apparently not very much has changed.

Nurses still eat irregularly, devote little time to active recreation and are not much concerned with prevention of diseases on their behalf.

Conclusions

1. The life-style of paediatric nurses is not conducive to maintaining health, even though it features as the imperative value in their lives.
2. The chief aberrations in health behaviour-patterns of the nurses concern: irregular nutrition, consumption of excessive amounts of monosaccharides, and preference of passive forms of recreation.
3. In education of future nurses, the role of health promotion in human life as well as the importance of health education in their professional activity should be emphasised.

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Knowledge of risk factors and guidelines for the management of asthma. The educational role of the nurse

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Abstract

Purpose: The aim of the study was to determine the level of knowledge concerning risk factors for the development of asthma and worsening of the course of the disease among patients, as well as achieving a better understanding of the educational role of the nurse in improving the quality of life of patients suffering from the disease.

Materials and methods: The study was a questionnaire study involving 100 patients suffering from asthma. 59 of them were diagnosed as having an allergic and 41 a non-allergic asthma. In the main they were patients suffering from moderate to severe asthma, who had attended the outpatient allergology clinic for many years.

Results: Analysis of the results obtained demonstrated the significant effects of asthma for the lives and health of the patients questioned. This was reflected in the high number of people registered as unable to work and receiving invalidity benefits, and influenced the activity of the majority patients in various spheres of life. A number of respondents demonstrated poor knowledge of the risk factors for asthma and ways of eliminating the illness. The majority of patients had a good knowledge of the names, doses and ways in which they should take their prescribed medication as well as showing an understanding of the principles of taking additional medicines as necessary. Their knowledge of the principles of anti-inflammatory treatment, which is a basic factor in the treatment of patients with asthma was, however very poor.

Conclusions: Among patients suffering from asthma there is a great need for health information. The majority of respondents expressed a willingness to take part in training sessions to be run by nursing staff. The focus of these educational sessions should be on improving the patients' knowledge about asthma as a chronic inflammatory disease, helping to eliminate and limit risk factors for the disease, treatment principles and avoiding the side-effects of prescribed medication.

Key words: asthma, risk factors, education, nurse's role.

Introduction

Chronic respiratory diseases remain an ever-increasing problem for modern medicine. In recent decades there has been a worrying tendency for the incidence of these diseases to grow, which is directly reflected in the increase in the costs of health care [1]. Asthma is one of the most common chronic conditions of the respiratory system. Epidemiological data show that in Poland 5.4% of adults and 8.6% of children suffer from asthma [2]. The incidence of asthma is increasing all over the world, especially in industrialised countries. Asthma causes a significant burden, not only by increasing the costs of health care, but also through reducing the ability of patients to work and limiting their participation in social and family life [3].

A fundamental aspect in the management of asthma is in the education of patients, with the aim of establishing their co-operation in its treatment, avoiding or limiting exposure to risk factors that may exacerbate the condition, developing individual treatment plans and ensuring the availability of continuous care [4].

Nursing personnel may run educational programmmes that are beneficial [5]. Modern nursing practices cannot be limited to meeting the patient's needs, but must be capable of active co-operation with patients, accompanying and advising them

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Table 1. **Characteristics of the group of patients examined**

	Allergic asthma	Non-allergic asthma
No. of patients	59	41
Gender F/M	40/19	22/19
Mean age	47±25 years	55±22 years
% of patients registered as unable to work due to invalidity	37%	20%
Degree of severity (%) Severe/moderate/mild	48/22/30	29/34/37
Family history of asthma	39%	39%
Mean no. of years treatment in outpatient allergology department	12±8 years	8±10 years

Table 2. **Assessment of patients' knowledge of the principles for treating asthma**

	Allergic asthma		Non-allergic asthma	
Researcher's assessment	Good	Poor	Good	Poor
Knowledge of names and doses of medication and ways in which anti-asthma medication should be taken	85%	15%	91%	9%
Knowledge of principles relating to how the rescue medication should be taken	76%	24%	78%	22%
Knowledge of the principles of anti-inflammatory treatment	31%	69%	20%	80%

on matters of disease prevention and improving their health, as well as helping them come to terms with their illness.

Materials and methods

Materials were collected by means of a diagnostic survey. The research technique used was a questionnaire and observation. A free observation method without the use of categories was applied in the research [7]. The questionnaire was designed especially for the purposes of this research and consisted of three parts: questions relating to personal details, history of the illness and treatment received; questions pertaining to knowledge of risk factors, their elimination and the principles of appropriate treatment; questions concerning nursing care and education. The questions used were open-ended, giving the respondent freedom in formulating his/her response. The anonymity of the respondents was preserved in filling in the questionnaire.

The study was carried out in the outpatient clinic of The Allergology and Internal Medicine Department of The Medical University of Białystok between May and October 2004. A total of 100 patients participated in the study.

Statistical analyses

The statistical analysis consisted of descriptive methods and appropriate correlational tests for quantitative and qualitative characteristics of the data. In order to provide a picture of the structure of the individual replies to the questionnaire, the endorsement of individual categories of answers were calculated in percentage terms for the entire sample. In many instances, respondents were able to choose more than one reply, which led to so-called questions with multiple answers.

Results

The research questionnaire was completed by 100 patients with a diagnosis of asthma, of whom 59 suffered from an allergic asthma and 41 a non-allergic asthma. The age range for the patients was between 18-75 years. Characteristics of the sample are presented in *Tab. 1*.

A very important aspect of the questionnaire were the questions relating to the way in which asthma influences patients' ability to work, their studies and their activities of daily living. 71% of those with the allergic and 59% of those with the non-allergic asthma replied that the disease has a negative effect on their ability to work. Over 80% of the patients in both of the examined groups considered that asthma has an unfavourable, limiting effect on their physical activity.

Tab. 2 shows the results of the analysis of responses to the questions concerning knowledge of the principles of the appropriate treatment for asthma.

An evaluation of the patients' knowledge of the risk factors involved in asthma, their elimination and the effects of allergens are presented in *Tab. 3*. Patients with the allergic asthma most frequently drew attention to risk factors such as respiratory infections, house dust and pollens. Patients with the non-allergic asthma referred most frequently to respiratory infections, house dust, cold air, physical exertion and tobacco smoke as significant risk factors. Patients with the allergic asthma reported most frequently that they are sensitive to allergens such as house dust mites (42%), grass and cereal pollens (15%) and animal fur (11%). 12% of the patients were unable to name allergens to which they are sensitive. A comparative analysis of patients' responses concerning the allergens to which they are sensitive and their case notes revealed that there was agreement in 56% of cases, partial agreement in 17% and lack of agreement in 27% of cases.

Table 3. **Assessment of the risk factors and ways of eliminating allergens in the groups examined**

	Allergic asthma			Non-allergic asthma		
Researcher's assessment	Good	Moderate	Poor	Good	Moderate	Poor
Knowledge of risk factors	22%	49%	29%	26%	32%	42%
Knowledge of ways in which to eliminate allergens causing sensitivity	25%	25%	50%			

Table 4. **Analysis of the need for training by nurses amongst the respondents**

Type of educational programme	% Patients choosing given educational programme	
	Allergic asthma	Non-allergic asthma
General information on asthma	88%	79%
Principles for taking medication	80%	72%
Avoiding side-effects of medication	66%	65%
Ways of eliminating risk factors and allergens causing sensitivity	90%	65%
Ways of giving up smoking	4%	12%

76% of patients with allergic and 93% with the non-allergic asthma declared a willingness to participate in an educational programme. The majority of respondents considered that nurses working with asthma patients should spend more time on the education of patients. *Tab. 4* shows the results of the analysis of responses to the question concerning what kind of information should be included in an education programme for patients with asthma.

Discussion

Current guidelines for the management of asthma place great emphasis on the importance of appropriate training and education of those suffering from the disorder [8]. The participation of patients in evaluating and monitoring their symptoms is essential, as is avoiding factors which may release allergens to which the patient is sensitive and understanding the principles of treatment and need for systematic medication. Appropriate care in this condition is determined by having an appropriate knowledge of the principles of treatment, avoiding the side-effects of drugs and ensuring that they are taken correctly [4].

Analysis of the responses to the questionnaire demonstrated that the majority of patients are over the age of 40 and have a long personal history of asthma. A very large number of the patients in both of the groups examined consisted of people registered as unable to work due to invalidity. This points to the need for intensifying the process of education, eliminating risk factors and individualising treatment methods. It is very important to ensure that the type of work undertaken by patients is suited to their possibilities. These measures would help to reduce the number of patients registering as disabled as a result of having asthma, and a number of those already registered as being unable to work due to invalidity would be able to return to work [9].

Asthma has a great influence on the physical activity of patients. This influence is already apparent in pre-school children, and for children of school age is associated with their frequently having to be excused from lessons in physical education. A very common problem is that the type of exercise and the place in which it is carried out are not suited to the capabilities of the child. Lack of physical activity and participation in sports has an unfavourable influence on the overall profile of psychosomatic development of children and young people [10]. It is necessary to initiate appropriate measures in order to increase physical activity, a process which involves selecting suitable forms of physical exercise and sports activities [11].

Asthma is a chronic condition which takes its course over a number of years. In order that the treatment process should proceed appropriately, it is essential that patients have an appropriate knowledge of the condition. The analysis of responses to questions aimed at achieving an understanding of patients' knowledge in connection with the treatment of asthma did not allow any definite conclusions to be drawn. The majority of patients know the names, doses and ways in which they are supposed to take the medication which was prescribed during the visit to the outpatient clinic. Equally, most respondents are well informed as regards taking additional, rescue medication as necessary in order to relieve episodes of dyspnoea and coughing. Nonetheless, asthma is a chronic inflammatory respiratory condition, which requires the necessity of long-term treatment with anti-inflammatory medication [12]. The results of the present study show that patients' knowledge in this area is extremely limited. In consequence, they may decide to stop taking their medication or fail to take it regularly, or they may have fears about side-effects of the treatment, all of which are likely to have a negative influence on the state of their health.

The results presented demonstrate a number of patients have insufficient knowledge of the risk factors affecting asthma and those which may worsen the course of the disease. Certain patients were unable to provide a single risk factor associated with asthma. Moreover, patients with the allergic form of the condition possessed very limited knowledge about allergens which may cause sensitivity, indicating the need for educational interventions in this area. Furthermore, the fact that a number of patients in this group revealed an understanding of their

condition which is not congruent with their case notes is of additional concern. This is particularly so, since elimination of the pertinent allergens and avoidance of risk factors in combination with effective pharmacotherapy may improve the control of asthma [13].

According to the results obtained in this study, nursing staff run training sessions for patients all too rarely, whilst the need in this area is great. Training of this kind should include above all information on the principles of treatment, ways of taking medication, ways of avoiding side-effects of the treatment, and for those with the allergic asthma, ways of avoiding and eliminating allergens as well as the principles of immunotherapy. Patient education is one of the paths towards improving the quality of life of people with asthma. An education programme that is properly carried out leads to the reduction of health care costs by reducing the number of specialist appointments and significantly influences the health status of the patient, his subjective well-being and quality of life. It also leads to an improvement in patients' satisfaction with health care services [14].

Conclusions

1. Patients' knowledge concerning the nature of the illness and the influence of risk factors in connection with the occurrence and course of the disease is inadequate.

2. The significant influence that asthma has on the patient's ability to work and his/her activities of daily living indicates the necessity for better control of the disease.

3. Respondents' knowledge concerning principles of treatment for asthma as a chronic inflammatory disease does not guarantee appropriate co-operation with and adherence to the advice of doctors.

4. Patients with asthma have a great need for information on health care. The majority of respondents expressed the wish to participate in an educational programme in this area run by specially trained nurses.

5. The educational programme designed to help patients cope with self-care in asthma should be focused on improving their knowledge of risk factors, treatment principles and ways of avoiding side-effects of the medication taken.

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Process of nursing as an active form nurse's work with patient in therapeutic team – project of evidencing the process of looking after a sick person for students of nursing Faculty of Health Sciences, UMK Collegium Medicum in Bydgoszcz

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Abstract

In years sixtieth in U.S.A. the process of nursing was introduced to the contemporary practice of nursing. U.S. was also the first country where the need of teaching the nurses on high standard was noticed and executed. In years 1960-1980 a very intensive development of nursing appeared there, the process of nursing strengthened it's position as a work method based on the theory of human's needs. In Poland idea of process of care developed from over twenty years. Instruction cares is based for scientific bases this of process. Process of nursing as dynamic work method, makes a work of nurse very active and raises the quality of care after a sick person. This process embraces with one's own range also healthy man, potentially threatened with disease, family, group of persons and environment. It is the modern form of nursing in the contrary to nursing understood in traditional way. The main purpose of introduction the process of evidencing to execution of classes like geriatrics and geriatric nursing with students of the third year Faculty of Health Sciences, UMK Collegium Medicum was moulding abilities of conducting the process looking after a sick person by students trough underlining the meaning of scientific bases of nursing.

Key words: nursing diagnosis, process of nursing, therapeutic team, theories of nursing.

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Introduction

Nursing is a defined care provided by a nurse for people in need. It consists not only of professional help provided on the basis of knowledge of skills but also showing the sympathy towards a patient and his family. The requirements towards a nurse are bigger and bigger nowadays. Thinking and action on one's own are preferred [1-4]. This duty requires gaining a lot of professional qualifications in the process of education.

In recent years the process of nursing was introduced to the contemporary practice of nursing [5,6]. This process is a basis of practice provided by a professional nurse nowadays. This introduction was a very important change in the field of understanding the significance of a nurse, who nowadays not only executes the orders but concentrates on a man and his health and nursing problems. The work with an individual person or with a social group is based on scientific theories of nursing and on knowledge of related sciences [5,6]. All nurses on their own, in a very responsible, planned, aimed and continuos way provide a professional care, which is also systematically checked and marked.

Process of nursing as an active form nurse's work with patient

The nursing was introduced to the way of scientific development by it's precursor Florence Nightingale living in the 19th century, whose merits and conceptions weren't appreciated and introduced to the practice many years after [7]. The originators of bases of modern and professional nursing were, on the other hand, American nurses. In The U.S., in the years of fifty, favourable conditions appeared to develop many disciplines of science including nursing. In those years significance and professional functions of a nurse were defined [7]. The U.S. was the first country where the need of teaching the nurses in high standards was noticed and executed. In the years 1960-1980 a very intensive development of nursing appeared there, the process of

Table 1. **Our project of the nursing process documentation**

Personal Data:

Initials		Education/profession	
Age		Income source	
Sex (M/F)		Family status	
Marital status		Financial condition	

Diagnosis in Latin:

Diagnosis in Polish:

Date of start of care:_____–_____–_____ Number of days in ward: _____
Visit in hospital: π in case of emergency π scheduled
Sensory modes: vision_____hearing_____
Bad habits (smoking, alcohol, stimulants):
_____
Past surgical operations and diseases:
_____

Number of visit in hospital	↵

Maladies:
Pain (kind, place, time, frequency, intensity)

Appearance of symptoms	yes	no		yes	no
vomiting			constipation		
abnormal stool			shortness of breath		
diarrhoea			swellings		

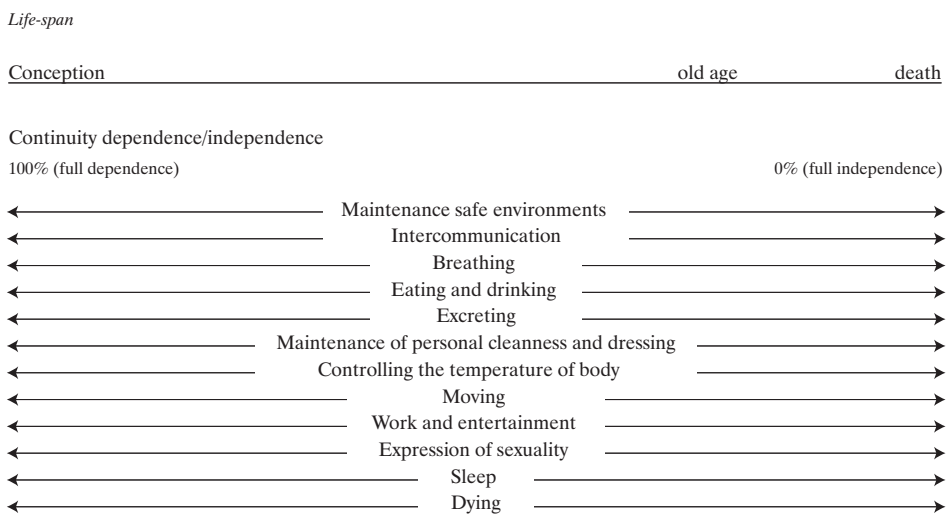
Status of consciousness of patient (unconscious, conscious).
Others symptoms: _____
Examination of laboratories and others: _____
Physical – mental and social status of patient

General status of health	π right π medium π bad π very bad
Risk of bed-sores	
Category of nursing care	π I π II π III π IV
Status of consciousness	π complete orientation π drowsiness π status before somnolence π somnolence π other
Pulse (quantity, tension)	
Blood pressure	
Breath (quantity, character)	
Colour of skin, tension, swellings, temperature and other	
Weight of body and height, BMI	
Urinary system (diuresis normal, abnormal, patient with catherer and other)	
Skeletal and muscular system	π self-reliant π wheelchair π crutches π lying
Patient is sole (scope self-care)	π yes π no π partly
Type of diet	π strict π liquid π light π other
Others observations about the patient (psychical status, social, frame of mind)	

Methods of treatment _____

nursing strengthened it's position as a work method based on the theory of man's needs [7]. In 1967 the first American publication entitled "The process of nursing" came out. Four stages of this process were suggested [8]. A bit earlier a definition of a nursing diagnosis appeared. In the seventies scientific researches were widely carried and discussions initiated by North American Nursing Diagnosis Association (NANDA) [7]. According to Gordon's theory, nursing diagnosis consists of three elements: the state of health, etiology of a problem and symptoms of a problem [7]. NANDA instead of Carpenito announces the following definition of a diagnosis. A nursing diagnosis is such a description of identified by a nurse man's reactions (changes in the state of health or in actual / potential pattern of interactions appeared at an individual person or at a group of people) which a nurse can identify legally and towards which a nurse is entitled to defining in a final way an intervention aiming at the maintenance of the state of health or at reducing, eliminating or appearing changes in it [6,7]. It is completely different from a doctor's diagnosis because it defines other patient's problems. Nursing diagnosis should define such patient's problems, which can be solved by the action of a nurse [7]. The process of nursing as a method of work with a patient, based on scientific bases is

Table 2. **Model of nursing by Roper N [17]**



defined by Carpenito: "The nursing is a diagnosis and therapy of men's reactions towards actual and/or potential health problems" [9]. Nowadays many authors are showing fife stages of the process of nursing: collecting the data, a nursing diagnosis, planning a care, executing this care and checking-up [7]. In Polish nursing it is said that "the process of nursing is a suggestion of such a nursing care, which uses conscious recognition of the biology, psychological and social state of an individual and his environment and taking aimed and planned actions in order to maintain or change the previous state, and also estimating obtained results" [5,10].

The process of nursing as a dynamic method of work, makes the work of a nurse very active and raises the quality of care after a sick person [3]. It is a modern form of nursing in the contrary to the nursing understood in a traditional way. The assumption, that this practice has an interpersonal character is the basis of professional nursing practice, like treatment a man in a holistic way. The process of nursing is integrated with the process of treatment. A nurse, while planning her activities, takes part both in diagnosing, treatment and rehabilitation of a patient. This is why good communication between a doctor and other members of a therapeutic group is very important [11].

The aims of introducing the process of evidencing to execution of classes like geriatrics and geriatric nursing with students of the third year of Faculty of Health Sciences, were: 1) Moulding abilities of conducting the process of looking after a sick person by students through underlining the meaning of scientific bases of looking after a patient; 2) Analysis of abilities of executing individual stages of the process by students; 3) Estimating collected documents by students in the shape of an auditorium questionnaire; 4) Improvement of the quality of looking after elder people in the way of increasing the student's engagement into taking care of sick people and in the way of raising the level of their skills and knowledge.

The project of evidencing the process of nursing

The project of evidencing appeared for the need of educating the students of Faculty of Health Sciences in nursing. It was modified and improved several times.

By the evidencing one tried to systematise the most important information needed to estimating the biopsychosocial state of a patient and diagnosing. The aim of introducing the practice of evidencing to students was undertaking the trial of teaching creative thinking, justified, planned action, analysing the situation of a sick person on one's own, moulding abilities of estimating the state of a patient and diagnosing, and next constructing, execution and estimating the plan of looking after a patient [4]. The process of clinical understanding is a process of solving problems. A decision in the field of recognition and finding categories of nursing problems is the first stage. A choice of action is the next stage. The features of this process are steered towards an aim, through marking indirect aims out and a choice of means of their execution [12]. A nurse's knowledge, subscribed values, convictions, circumstances and a patient by his own, all this influences on taking a decision, in other words, solving patient's problems. A nurse reaches a therapeutic alliance with a patient and in this way he becomes an active member in the process of nursing. Both members, a patient and a nurse are allies in achieving marked aims [12].

The documentation was worked out more widely and more exactly in order to help students, who plan taking care of the chosen patient. It contains the scale defined by Barthel needed while estimating physical efficiency state of a patient [13,14]. Next, it contains the scale of estimating the risk of bed-sore by Norton and Waterlow, scale of estimating the category of nursing care [11]. They are collected in one place in order to make it easy for a student to estimate the health situation of a sick person. They are especially important while an elder person's state of health is estimated. The documentation also contains

Table 3. **Models of nursing**

Authors	Nursing theories	Description
F. Nightingale	Environment and hygiene	Making optimum hygienic environment for cares of health.
V. Henderson	Theory of needs. Human's basic needs	Help in diagnosing and accompanying in realization of man's needs disturbed by disease. Restoring independence.
D. Orem	Theory of self-care deficit Theory of systems in nursing – redemptive, partly redemptive, aiding and teaching	Size and kind of deficit of care diagnosis and preparation to self-care and self-nursing in health and in disease.
C. Roy	Adaptation model	Preparation man, families and environments to problems resolving. Given support helps man with creation necessary changes in his environment.
B. Neuman	Stress	Reducing of negative results of stress as assignment of nurse and ill.
N. Roper	Practical activities	Getting by man maximum state of independence in undertaking important practical activities.

review of chosen nursing theories [2,3,6,15-17]. Placing earlier detailed contents we wanted to make students aware of scientific bases of undertaken nursing tasks towards a patient and to strengthen the principles of a planned and aimed action. The suggested documentation isn't too complex as to it's execution during practical lessons or professional practice of a student. It also takes specificity of looking after elder people into consideration, but not only, because it also has a virtue of universal use. A student on his own or after consultation with a person, who carries classes, decides and justifies the choice of a nursing model, estimates it's usefulness in a specific case. A student is also inspired to conception work, in this way he can suggest additional enclosures to the documentation for example: guides for an interview, other scales of estimating health (MMSE – Mini-Mental State Examination, ADL – Activity of Daily Living, NHP – Nottingham Health Profile and others), short tests checking up knowledge of a patient on his illness, standards of care and others.

Collecting information and estimating the state of a patient is the first stage of student's work.

Next a student does following orders:

1) Define in Barthel scale (in score) psycho-physical fitness of a patient; 2) Define in Norton scale and/or in Waterlow scale the risk of appearing of bed-sore at your patient; 3) Classify your patient into one category of nursing care; 4) Choose a nursing model; 5) Diagnose and estimate the plan of looking after a patient.

The documentation contains review of chosen nursing theories: Life activities undertaken by a man in Roper's model [17].

Conclusions

The process of nursing is a complicated procedure of ensuring the professional care in execution of needs and in solving patient's problems. Using the process of nursing as a method of a nurse's work is proceeded by thorough getting to know scientific theories of nursing, determinants of estimating a patient's state, concepts and standards appearing in nursing and medicine and many complicated abilities such as: intellectual, instrumental and ability of communicating with a sick person. In the education process concerning high school nurses, a huge emphasis is put on gaining as high level of developing these abilities as possible, especially during the direct work at a patient's bed. Abilities collected during the process of learning bear fruit in future development and success in work.

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Influence of Education at The Childbirth School on Breast Feeding

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Summary

Breast feeding is the only proper way to feed a newborn and a baby during the first several months of his life. The most professional way of preparation for natural feeding is The Childbirth School. Education ought to be continued in maternity wards. The aim of this study is to prove that women who participated in The Childbirth Courses are better motivated and prepared for breast feeding. Material and methodology. The research comprised 294 lying-in women hospitalized in maternity ward in Clinic of Obstetrics and Perinatology, Pomeranian Medical University in Szczecin from June 2001 to December 2002. The examined women were divided into two groups:

- **Group I – "study group" – comprised 129 lying-in women who attended the childbirth school courses during at least one pregnancy, but no earlier than 2 years ago.**
- **Group II – "control group" (reference group) – included 165 lying-in women who did not participate in any organized forms of prenatal education.**

Every woman who agreed to participate in the research was accepted. There was applied analysis of lying-in woman's documentation and author's questionnaire which was also used for further research.

As a result of the research it was found that The Childbirth School increases motivation for natural feeding and prepares women for this activity. It also showed that more emphasis should be given to childbirth education for puerperal women in maternity wards; it refers in special to those women who did not attend The Childbirth School.

Key words: The Childbirth School, natural feeding, education.

Introduction

Breast feeding is the only proper way to feed a newborn and a baby during the first several months of his life [1,2]. Natural feeding stands for one of the main topics touched during prenatal education at The Childbirth School [3,4,5]. This is the place where future mothers are prepared for the difficult art of feeding their babies [6]. To succeed in natural feeding one sometimes has to overcome many problems [1]; women usually get familiar with them at The Childbirth Schools and in maternity wards [5,7]. What seems particularly important, though, is the proper motivation. A mother who knows advantages of natural feeding [7] and is deeply motivated, will not get discouraged so easily because of cracked and sore nipples, or too much milk, she is not likely to resign at once due to lactation crisis [1,6], as well. Preparation for lactation ought to be continued in maternity wards [2,5].

The aim of the study is to show that women who attended The Childbirth School are more strongly motivated and better prepared for breast feeding.

Material and methodology

The research comprised 294 lying-in women hospitalized in maternity ward in Clinic of Obstetrics and Perinatology, Pomeranian Medical University in Szczecin from June 2001 to December 2002. The examined women were divided into two groups:

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Table 1. **Analysis of the women's age from the study and control groups**

Group	n	min-max	$Q_1 - Q_3$	m_e	M ± SD	p
I	129	20-42	26-30	28	28.2 ± 3.8	>0.05
II	165	18-43	24-31	27	27.5 ± 5.5	

n – number of individuals in the group; min – minimum value; max – maximum value; Q_1 – the first quartile; Q_3 – the third quartile; m_e – median; M – arithmetic mean; SD – standard deviation; p – significance level

- Group I – "study group" – comprised 129 lying-in women who attended the childbirth school courses during at least one pregnancy, but no earlier than 2 years ago
- Group II – "control group" – included 165 lying-in women who did not participate in any organized forms of prenatal education.

Every woman who agreed to participate in the research was accepted. There was applied analysis of lying-in woman's documentation and author's questionnaire which was also used for further research. The part of the questionnaire concerned with natural feeding was based on directions of WHO and UNICEF, which define the exceptional meaning of prenatal and postnatal care for preservation, propagation and support for breast feeding [2]. The assumptions are included in such documents as "The Initiative – The Child-Friendly Hospital" and "10 Rules of Breast feeding" [2], programmes: "The Promotion of Breastfeeding" [8], "The Propagation of Breastfeeding" [9] and "Improvement Programme of Perinatal Care in Poland" [5]. The obtained numerical values were subjected to statistical analysis. The study and control groups were compared in terms of qualitative features using a non-parametrical significance test – a chi-square independence test and a chi-square independence test with the Yates' correction. Whereas comparisons of quantitative features were made with a non-parametrical significance test – Mann-Whitney U test.

Results

The youngest lying-in woman in the study group was at the age of 20, and in the control group – 18. The oldest woman in the group I was 42 years old, and in the group II – 43. The average age in the study group equalled 28.2 years, and in the control group – 27.5 year). There were not found any statistically important differences between the age of the lying-in women from the study and control groups, p>0.05 (*Tab. 1*).

In the study group considerably greater number of women were dwellers of towns with population of over 100 thousand (p<0.01). As for other determinants there were not found any statistically important differences.

While analysing educational background one can notice that statistically many more (p<0.001) women from the study group (76%) received higher education, whereas in the control group it was only 31.5% which is more than twice less. On the contrary, noticeably more (p<0.001) women from the control group had secondary and technical/primary education. As for other determinants of financial conditions there were not observed any statistically vital distinctions between the groups (p>0.05). Characterization of the women from the study and control groups based on socio-economic and obstetric factors is depicted in *Tab. 2*.

Table 2. **Characterization of the women from the study and control groups based on socio-economic and obstetric factors**

Dwelling place	Group I (n = 129)		Group II (n = 165)		χ^2	p
	n	%	n	%		
Country	4	3.1	12	7.3	2.45	>0.05
Town – up to 25 thousands	5	3.9	11	6.7	1.10	>0.05
Town 25 – 100 thousands	4	3.1	13	7.9	3.03	>0.05
Town – over 100 thousands	116	89.9	129	78.2	7.19	**<0.01**
Education	**Group I**		**Group II**		χ^2	p
Primary or technical	4	3.1	40	24.2	25.4	**<0.001**
Secondary	27	20.9	73	44.2	17.5	**<0.001**
High	98	76.0	52	31.5	57.2	**<0.001**
Material situation	**Group I**		**Group II**		χ^2	p
Bad or very bad	3	2.3	6	3.6	0.09	>0.05(Y)
Average	39	30.2	59	35.8	0.99	>0.05
Good	70	54.3	81	49.1	0.78	>0.05
Very good	17	13.2	19	11.5	0.19	>0.05

χ^2 – a chi-square independence test; n – number of individuals in the group; Y – Yates' correction factor; p – significance level

Table 3. **The type of feeding chosen by lying-in women from the study and control groups**

Type of feeding	Group I (n= 129)		Group II (n= 165)		χ^2	p
	n	%	n	%		
Breast feeding	128	99.2	153	92.7	7.21	<0.01
Bottle-feeding	0	0	8	4.8	4.73	<0.05 (Y)
Mixed	1	0.8	4	2.4	0.40	>0.05 (Y)

χ^2 – a chi-square independence test; p – significance level; Y – Yates' correction factor; n – number of individuals in the group

Significantly more (p<0.01) women from the study group (99.2%) declared breast feeding as the only way of feeding a baby, whereas in the control group their number was a little smaller – 92.7%. As for bottle-feeding many more mothers (p<0.05) from the control group wanted to feed their babies in this way – 4.8%. Not a single lying-in woman from the control group declared this way of feeding a baby (*Tab. 3*).

The surveyed women from the control group much more often (p>0.01) planned to breast feed "as long as possible" than in the study group. At the same time, however, noticeably more (p<0.05) women from the control group (6.2%) intended to breast feed their babies for one month only, whereas no one in the study group (0%) had such an intention. Other determinants did not much differ statistically, p>0.05 (*Tab. 4*).

Analysis of natural feeding after 4-6 weeks from delivery showed that 93.1% of women from the study group breast feed their babies after the lapse of this time, while in the con-

Table 4. Period of natural feeding intended by lying-in women from the study and control groups (excluding bottle-feeding women)

Intended period of breast feeding	Group I (n= 129)		Group II (n= 157)		χ^2	p
	n	%	n	%		
Up to 1 month	0	0	8	6.2	6.26	<0.05(Y)
Up to 3 months	1	0.8	3	2.3	0.25	>0.05(Y)
Up to 6 months	38	29.5	44	33.8	0.58	>0.05
Up to 1 year	48	37.2	38	29.2	1.86	>0.05
Longer than 1 year	15	11.6	17	13.1	0.13	>0.05
As long as possible	27	20.9	47	36.2	7.35	<0.01

χ^2 – a chi-square independence test; p – significance level;
Y – Yates' correction factor; n – number of individuals in the group

***Table 5*. Natural feeding after 4-6 weeks from delivery in the study and control groups**

Is she breast feeding?	Group I (n= 130)		Group II (n= 158)		χ^2	p
	n	%	n	%		
Yes	121	93.1	123	77.8	12.8	<0.001
No	9	6,9	35	22.2		

χ^2 – a chi-square independence test; p – significance level; n – number of individuals in the group

trol group only 77.8%. It means that statistically many more ($p<0.001$) surveyed women from the control group gave up natural feeding during 4-6 weeks (*Tab. 5*).

Analysis of breast feeding and its duration according to independent variables such as age, dwelling place, education, material situation of lying-in women from both groups was illustrated in *Tab. 6*. Women from the control group aged below 25 years gave up natural feeding noticeably more frequently ($p<0.05$) than their peers from the study group. In other age groups there were not found statistically important differences. It is worth to be mentioned that in the study group neither woman older than 36 years gave up breast feeding. Taking into consideration dwelling place, noticeably more ($p<0.001$) women from the study group living in towns with population of over 100 thousand were breast feeding after 4-6 weeks from delivery – 94.0% (in group II – 76.8%). Most naturally-feeding mothers in both groups lived in towns of 25-100 thousand dwellers.

Analysis of natural feeding in respect to education of surveyed women did not reveal any statistically important differences between groups. There can be noticed a certain rule, however, in the control group: the higher education the more breast feeding mothers.

Studying the relation between natural feeding and financial situation we can easily notice that in the study group worse financial conditions meant more breast feeding women, while in the control group it was quite opposite – the lower earnings went in pair with greater number of women who resigned from breast feeding. Women from the control group whose material situation could be described as average more often ($p<0.01$) gave up breast feeding than women from the study group. In other groups statistically essential differences were not noticed (*Tab. 6*).

***Table 6*. Breast feeding after 4–6 weeks after delivery according to independent variables in the women from the study and control groups (excluding the bottle-feeding women in childbirth)**

Age	Breast feeding				Finished breast feeding			
	Group I		Group II		Group I		Group II	
	n	%	n	%	n	%	n	%
Up to 25 years ($n_1=26$, $n_2=56$)	24•	92.3	40	71.4	2	7.8	16•	28.6
26-30 yeras ($n_1=74$, $n_2=56$)	69	93.2	49	87.5	5	6.8	7	12.5
31-35 years ($n_1=23$, $n_2=31$)	21	91.3	24	77.4	2	8.7	7	22.6
More than 36 years ($n_1=6$, $n_2=14$)	6	100.0	9	64.3	0	0	5	35.7
Dwelling place	**Group I**		**Group II**		**Group I**		**Group II**	
Town – over 100 thousands ($n_1=116$, $n_2=125$)	109 •••	94.0	96	76.8	7	6.0	29•••	23.2
Town 25-100 thousands ($n_1=4$, $n_2=12$)	4	100.0	10	83.3	0	0	2	16.7
Town – up to 25 thousands ($n_1=5$, $n_2=9$)	4	80.0	7	77.8	1	20.0	2	22.2
Country ($n_1=4$, $n_2=11$)	3	75.0	9	81.8	1	25.0	2	18.2
Education	**Group I**		**Group II**		**Group I**		**Group II**	
High ($n_1=98$, $n_2=48$)	91	92.9	43	89.6	7	7.1	5	10.4
Secondary ($n_1=27$, $n_2=74$)	25	92.6	57	76.7	2	7.4	17	23.3
Technical and primary ($n_1=4$, $n_2=35$)	4	100.0	22	64.9	0	0	13	35.1
Material situation	**Group I**		**Group II**		**Group I**		**Group II**	
Very good ($n_1=17$, $n_2=18$)	15	88.2	16	88.9	2	11.8	2	11.1
Good ($n_1=70$, $n_2=77$)	64	91.4	63	81.8	6	8.6	14	18.2
Average ($n_1=39$, $n_2=56$)	38••	97.4	41	73.2	1	2.6	15••	26.8
Bad and very bad ($n_1=3$, $n_2=6$)	3	100.0	2	33.3	0	0	4	66.7

• $p<0.05$ ••• $p<0.001$ •• $p<0.01$; n – number of individuals in the group

Discussion

Considerably more women in childbirth from the group I claimed natural feeding – 99.2% as opposed to the control group where most women (92.7%) wanted to feed their babies with a bottle. This is a result similar to that obtained by Cerańska-Goszczyńska and co-authors who observed that 100% of women educated at The Childbirth School and 94% in the control group chose to breast feed [3]. The researches carried out by Szwałkiewicz show that 100% of The Childbirth School participants took up natural feeding [6], and those done by Ulman-Włodarz prove that almost 90% of The Childbirth School participants apply breast feeding [7].

Considerably less women from the study group planned to feed naturally for the period of one month only, whereas in the control group noticeably more women intended to breast feed "as long as possible". It does not agree with Cerańska-Goszczyńska and co-authors' report which states that The Childbirth School participants proposed longer period of breast feeding [3]. As for other determinants there were not found any statistically vital differences. Analysis of natural feeding after 4-6 weeks from delivery revealed an important distinction in respect to the lying-in women from the study group, who not so often gave up breast feeding in this period of time. Quoting other authors, Inch notifies that the most common reason for giving up natural feeding is pain of nipples and insufficient amount of milk [10]. They are the problems tapped at The Childbirth Schools [4,5]. Thus, we can assume that such schools increase motivation to breast feed and prepare women for this type of feeding.

Resignation from breast feeding considering age demonstrated only one significant divergence – in the control group women at the age of 25 or less more often gave up breast feeding. In other age groups there were not found any crucial variations but these numbers were always smaller in the study group.

Analysis of breast feeding duration in dependence on residence showed that in towns of over 100 thousand citizens considerably less women resigned from breast feeding in the study group than in the control one. In case of other determinants there were not observed any vital differences, still they cannot be treated as the objective results because the groups were not numerous enough.

There were not noticed disparities referred to resignation from natural feeding in respect to education. In contrast to this, Ulman-Włodarz states that women with higher education breast feed longer and not so often resign from natural feeding [7]. Also Ulman-Doniec writes that all higher educated women breast feed and all of them do it for the period of more than three months [11].

Taking into account material situation, there was only found one important difference in relation to women whose material situation was average. Considerably less lying-in women from the study group who declared average material conditions resigned from breast feeding. In this group not a single woman who described her financial situation as bad or very bad gave up natural feeding during 4-6 weeks after delivery; the group was not numerous enough though to draw valid conclusions.

Women who decided to finish breast feeding during the first 6 weeks after delivery were mainly those who did not attend The Childbirth School, were 25 years old or younger, with average financial conditions; there was not noticed any co-relation with educational background. On the contrary, The Childbirth School participants less frequently resigned from breast feeding in that period and their resignation was related neither to age nor education, it happened more often, however, in case of women who described their material situation as very good.

Conclusions

1. The Childbirth School motivates and prepares women to feed naturally.
2. More emphasis should be given to childbirth education for puerperal women in maternity wards; it refers in special to the women who did not attend The Childbirth School.

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An older person as a subject of comprehensive geriatric approach

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Abstract

The simultaneous presence of many disorders (physical, psychological, and social) and unmet health care needs in elderly people require a more complex assessment then just a routine diagnostic examination. The involvement of comprehensive geriatric assessment provides a health care model that integrates medical and nursing care with social support. A geriatric assessment could be carried out in a wide variety of settings including: acute hospital units, long-term care, out-patient dispensaries and home visits. A holistic and comprehensive geriatric approach should cover physical, functional and mental assessments as well as the caregiver's strain. For preventive care, effort should be placed on the aspect of health promotion, diseases prevention, and disability postponement. Rehabilitation is an important area for older people, as a majority of them requires a temporary rehabilitation after a major illness before they could regain independence in the community. In order to provide a cross comparison among different patients in different settings, a standardized methodology or instruments will enable to make comparisons better then subjective investigation. To provide a holistic and interdisciplinary health care for the elderly, training doctors, nurses and other health care professionals in geriatrics and gerontology is essential.

Key words: geriatrics, comprehensive geriatric approach, team approach.

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The aging process is a physiological phase in an ontogenesis. Nevertheless, age-related changes are most often accompanied by the effects of previous diseases, injuries, as well as co-existing multi-morbidity. The biological ageing can be described as metabolic, degenerative, inflammatory or autoimmunological disorders, however, all of them lead to the restriction of the organism's functional reserves [1,2].

The functional deficits that progress with age are visible at the level of the organ's impairment in the form of initially latent, circulatory, respiratory, excretory, auditory, visual and many other organs' failures, as well as at the functional efficiency of the entire organism – locomotive, instrumental and personal activities of daily living. At the beginning, the dysfunctions are most often visible in the range of more complex activities, such as: housework, shopping, preparing meals, managing one's own finances, using the telephone, cash machine, computers, and later on in basic activities such as: bathing, keeping oneself clean, using the toilet, moving from the chair to the bed, getting dressed/undressed, or eating by one's self.

The functional dysfunctions of the different organs, as well as the entire organism require a holistic, multi-speciality and comprehensive approach, as well as the involvement of medical and non-medical practitioners, not just medical doctors [3]. The family and the community are undoubtedly always needed. Nurses and physical therapists in first order after, then social workers, psychologists, occupational therapists, dieticians, and others, however always a family caregivers and the society.

Geriatrics is a specialisation, which integrates an interdisciplinary approach. Its aims may be summarised as follows:

- Maintaining health in old age by high level of engagement and avoidance of diseases;
- Early illness detection as well as appropriate and effective treatment;
- Maintaining maximum independence and autonomy despite the existence of illnesses and disabilities;
- Guaranteeing care and support in the event of terminal illnesses.

Geriatrics also referred to as clinical gerontology or medical science for the advanced age is one of the younger medical disciplines. Its development has taken place over the last decades as a response to the widely prevalent and specific socio-medical needs of the older people in an aging population.

In the perspective of a life cycle geriatrics constitutes the last link in a triad of basic medical disciplines after paediatrics and "mediatrics", i.e. classical internal medicine. Geriatrics has evolved from internal medicine due to the specifics of the symptomatology of illnesses at an elderly age, the distinction of their course, and the complexity of medical problems determining or causing non-medical problems – environmental, care giving, psychological, ethical as well as demographics. It is also characterizes by a holistic approach to the patient. To a smaller extent, geriatrics are oriented in diagnosing and treating individual internal diseases and to a larger extent in identification and solving polyaethiological problems resulting from the multi-disease and multi-organic character of age-related disorders.

Geriatrics is mainly focused on the complex character of pathology – the effect of overlapping of age-related decline and multi-morbidity. Age-related health problems go beyond the scope of the traditional internal medicine, as exemplified by certain diseases typical for old age, such as neurological conditions (stroke, Parkinson's disease), psychiatric conditions (dementia, depression), urological conditions (incontinence, prostate hypertrophy), ophthalmologic conditions, rehabilitation problems and many other conditions. This illustrates the interdisciplinary nature of geriatrics in the scope of medicine.

Due to environmental and social context of aging, the interests of gerontology exceed the scope of medical science and include issues bordering on other sciences – sociology, psychology, demographics, and even law or architecture – in the extent that they concern the elderly. This is the proof of the interdisciplinary character of gerontology, also in its non-medical meaning.

Principles of geriatric care

Arguments of demographic, social and biological nature pose specific requirements on all medical professions, particularly on doctors and nurses. Meeting those requirements depends on complying with the basic principles of the geriatric care. These include: commonness of the care, its availability, continuity, high quality, individualisation and comprehensiveness, as well as integration with other services [4].

Another principle calls for respect for the patients' autonomy and providing them with access to the social care system.

Family doctors have the potential to meet the requirements of geriatric care. They care for all patients who trust them. They are, or should be widely available on an everyday basis, since they are practitioners in the local communities. They provide medical care on a continual and lasting basis, and a minimum competence in geriatrics is required from them. Regardless of their motivations, intentions or competence, family doctors are, in fact, the "forefront geriatricians" [5,6].

Nurses are the doctor's main partners in providing overall geriatric care, not only on the level of primary health care. Each of these practitioners has his or her own professional instruments or tools – its use and exchange of conclusions from applied procedures is conducive to prompt and comprehensive assessment and remedy to the patient's problems. Nurses and doctors form the main stem of the interdisciplinary and comprehensive geriatric team approach, into which they should include other specialists. Due to the huge component of social and financial problems of many elderly patients, including a social worker in such team is highly desirable on a permanent basis.

Role of pathology in old age

The most important aspect of the aging body is the progressing loss of stability of the homeostasis and, consequently, the increasing odds of death [2,4]. Decline in the buffer capacity of the homeostasis results in its growing instability, which predisposes to death, in result of stressors, like infections, bleeding, surgical procedures, etc.

The co-existence of many diseases and multi-organ disorders, along with results of former surgical procedures and injuries causes diagnostic problems, particularly in frail older persons.

Another factor impeding early diagnosis and treatment is the occult and atypical presentation of a condition, which results in its relatively late manifestation. Quite often general discomfort and confusion are the only symptoms of pneumonia, while other, physical symptoms are scant and atypical. In such case only changes revealed in lung x-rays can help in diagnosis. The characteristic feature of the pathology of the old age is the susceptibility to sudden deterioration, particularly when early treatment has been delayed or neglected altogether. This is another proof of deterioration of adaptive mechanisms of the body in old age.

Taking into account the significant limitation of natural functional reserves of the old body, inhibition and limitation of recovery after serious conditions should be taken into account. Complications and side effects of medications used for co-occurring conditions are liable to occur.

Other features of pathology in old age are nutritional disturbances. They result from malnutrition, malabsorption or interactions with drugs, while the deficiency of vitamins and minerals can imitate illnesses or be viewed as symptoms of ageing.

Iatrogenic symptoms, or unintentional results of pharmacological treatment, are particularly dangerous for elderly people, for example due to a much higher intake of drugs in comparison with younger persons. Symptoms of undesirable effects of drugs are not distinctive. Sometimes they are treated symptomatically, using other pharmaceuticals. Such a hazard is even more possible, when there is no communication between different doctors prescribing medications to the same patient.

Environmental determinants of a disease are an immanent attribute of pathology of the older people. Identification of the environmental risk factors, including assessment of the patient's independence in activity of daily living is the basic prerequisite of proper diagnosis and treatment.

The specific and multidimensional scope of health aspects of the elderly calls for revaluation of the definition of health

in old age [7]. It should be described in three dimensions: (1) as a lack of illness; (2) as keeping best possible functions; and (3) as existence of an adequate support system (family, health care, community, social). Old persons, even when suffering from different conditions, can be viewed as "healthy", when the pathology does not result in significant limitation of their functioning (e.g. well controlled diabetes) or when their functional efficiency is provided by efficient rehabilitation and community care.

Aims and stages of the overall geriatric care

The principal aim of treating the elderly is to keep and reinforce their functional efficiency in order to restore their ability to independent life in the community, and, consequently, to offer them the best possible life quality in old age. Eliminating illnesses in old age is not an aim in itself, unless it substantially influences the quality of life, physical, emotional and mental fitness. The process of geriatric care has four stages [4].

STAGE 1

ASSESSMENT OF THE HEALTH STATE (physician, nurse)

- FUNCTIONAL ASSESSMENT (nurse, psychologist, physician)
- RESOURCES (nurse, social worker, physician)

STAGE 2

DETERMINATION OF THE AIMS OF CARE GIVING

- What are the principal needs of the patient?
- What are the available remedies?
- To what degree the task is feasible?

STAGE 3

SPECIFICATION OF THE ACTION PLAN

- Actions aimed at assimilating "patient's needs" with "community resources"
- Therapy, rehabilitation, community aid

STAGE 4

REGULAR CONTROL

- Does the improvement meet the expectations?
- Does the applied plan need any changes?

The first aim to achieve is an overall assessment of the patient's health state, including a comprehensive diagnosis and prognosis. In this stage it is crucial to determine the influence of the disease or other health problems on the degree of the functional disability. That should involve standardized measurements [8] which assess the ADL, cognitive functions, e.g. MMSE (Mini-Mental State Examination) [9], emotional functions, e.g. The Geriatric Scale of Depression [10]. Currently most of the scales are available in Poland in the format of a questionnaire consisting of modules (EASYCare) [11,12], which plays a role of an assessment system of an older person in his or her environment. The standardization of evaluation allows monitoring and control of the patient's state in long-term observation, as well as comparison in cross-sectional studies.

The comprehension of the geriatric care should be preceded by the complexity of assessment, including identification of available community resources, remedies (support of family, neighbours, volunteers, self-help organizations, public system of social welfare, etc.). It is also important to appreciate cultural values and mentality of the patients, as well as their education, since the positive results of the evaluation have beneficial influence on treatment and they also aid communication.

In the second stage of geriatric care, it is important to find answer to the following question: "What is the principal need of the elderly person and what are the realistic chances to meet that need". Usually the problem refers to very old persons and concerns health needs, aid needs, comforting pain, social life, etc. Identification of the aims requires a communication among the physician, the community nurse and, often, a social worker on one side, and the patient and possibly his or her carer on the other.

Having identified the aims of the geriatric care, the findings should be shifted into a plan of action, and individual tasks should be assigned to the members of the geriatric care team [3]. Each of the team members is responsible for supervising results of the actions taken and possible changes. The division of tasks among the members of the geriatric care team usually reflects their professions – the family doctor is responsible for treating health problems, the community nurse for adapting homes, nursing, therapy, tests, education, control of how the doctor's orders are fulfilled, while the social worker for providing social services, in kind or in financial aid. Another two team members are of great importance – an occupational therapist and a physiotherapist. Their task is to prepare the patient and his immediate surroundings in such way that would allow the patient to live in his home on his own.

The most critical situation that requires effort of the geriatric care team is the discharge of a patient from hospital after a serious condition (cerebral or heart stroke, surgical procedure, etc.). Maintaining contact with the hospital and preparing the patient's environment in advance significantly improves results of such actions.

In terms of home therapy and care, the geriatric giants belong to particularly difficult conditions [13,14].

The role of the geriatric prevention

It is a well-known fact that preventive actions reduce mortality caused by age-related conditions. Controlled randomised studies proved the positive effects of a comprehensive and interdisciplinary approach, planning and implementation of long-term care for elderly persons in their own living environment [15]. Carrying out screening examinations aimed at early diagnosis of disorders that may result in disability and loss of autonomy of very old persons (75 and older) results in delaying the institutionalisation and prolongs the life independence of the elderly [16,17].

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The knowledge of bedsores prevention among Health and Nursing Department students of Medical University of Białystok

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Abstract

Purpose: **Despite great advances in 21st century medicine, the problem of bedsores is as important as a couple of dozens years ago. The knowlegle of bedsores cause mechanisms of development, risk factors evaluation and prevention are necessary to effectively them.**

Material and methods: **The aim of our study was the assesment of bedsores prevention knowledge of IIIrd year part-time student nurses at Health and Nursing Faculty of Medical Univesity of Białystok. The secondary aim was to determine factors on which this knowledge depends.**

The research was based on questionnaire created for this purpose. The research target were 50 female students working as nurses in various health service units. The study was performed between May and June 2004.

Results: **Majority of students (68%) did not take part in bedsores prevention courses. Their knowledge was based on nursing school classes they had and self-education (50%). Many hospitals which employed the students did not implement bedsores prevention standards (58%) and did not create Bedsores Prevention Team (50%).**

Conclusions: **According to obtained results, there seems to be an urgent necessity to implement comprehensive action towards increasing bedsores prevention knowledge among part-time students.**

Key words: bedsore, prevention, standard.

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Introduction

Bedsores result from the impairment of blood flow and from mechanical stress to the skin and tissues over a bony area that has been under pressure for a prolonged period. Other important causes are horizontal forces working in parallel to the skin's surface, which make the upper layers of tissue move over the lower layers [1-4]. Excessive exposure to moisture such as sweat, blood, urine or faeces, skin maceration, accumulation of anaerobic products stimulated by emotional stress and vasospastic effects of nicotine also increase the likelihood of bedsores. Thus, many factors are involved in the bedsores etiology [1,4-7]. Almost all patients with limited mobility, especially over long periods of time, are prone to bedsores. Their creation is further enhanced by the following factors: patient's inability to change position, patient's awareness state and activity, poor nutrition, incontinence of urine and faeces, diabetes, some diseases treated with immunosuppresants [3,6,8,9]. Bedsores are characteristic for patients of the following wards: Neurology, Neurosurgery, Intensive Care, Orthopedic. Areas especially exposed to bedsores are: lower back, ischiadic tubers, trochanters, heels and ankles [1,5,10-12].

The basis of modern nursing is the prevention of bedsores. It requires the knowledge of pathological process, instant hazard recognition, and implementation of modern prevention methods. Obviously, bedsores are easier to prevent than cure [7,12-16].

Standards aiming at improving the quality of service have been steadily introduced over years. They concern the bedridden and immobilized patients and are based on nursing documentation using Northon, Douglas, CBO Bedsore Hazard Classifications and comprehensive preventive actions [9-11,17]. Effectiveness and feasibility depend on cooperation of all persons involved in the therapeutic process and the level of their knowledge and skills.

The current trend to improve patients' well-being depends on patients' satisfaction from nursing and the satisfaction of the personnel. A patient with high bedsore hazard who leaves the

Table 1. **Action taken at the first sight of bedsore wound**

Actions	Number	%*
Frequent repositioning	45	90
Use of items that help reduce pressure	45	90
Relieving the pressure in that area	40	80
Using dressing on the wound	25	50
Recording the event (data)	10	20
Informing the doctor	10	20
Use of 10% NaCl solution on the wound	5	10
Application of ointment with antibiotic	2	4

* Responses do not sum up to give 100% because the polled persons could give more than one answer

Table 2. **Preventive equipment and medicaments known to the polled nurses**

Equipment and medicaments	Number	%*
Anti-bedsore mattress	35	70
Cushions, Pads, etc.	15	30
Adjustable beds	2	4
Pressure relieving silicon gels	2	4
Talc/Alantan	39	78
Cosmetic olive	10	20
PC30V	4	8
Body balms	5	10
Application of grease	20	40
Spirit	25	50
Cleansing agents	7	14

* Responses do not sum up to give 100% because the polled persons could give more than one answer

hospital without any wounds will truly appreciate the quality of service. Consequently, positive attitude of patients will motivate the personnel and increase their preventive efforts. [2,18].

The aim of our study was to assess bedsores prevention knowledge among nurses and to determine factors on which levels of the their knowledge depend.

Material and methods

The study was performed in 2004 and the research target were 50 female students of IIIrd year Nursing Studies at Health and Nursing Faculty of Medical Univesity of Białystok. The students' age ranged from 25-40 years, with the average of 33.4 years. The nurses worked in various inpatient health service units and hospital wards such as: Intensive Care Units (28%), Surgical Department (16%), Oncology Units (10%), Social Assistance Houses (22%). Most frequently (72%) they were ward nurses with at least 5 years of work experience.

The research tool was originally prepared questionnaire consisting of 37 open questions concerning:

- knowledge of bedsore causes,
- knowledge of bedsore prevention,
- bedsore prevention training,
- organization of preventive measures in hospitals,
- hospital equipment: agents and devices.

Results

The nurses knew the term "bedsore", more then 90% of them could correctly define the term, the rest gave incomplete definition. There were no wrong answers.

According to the polled, bedsores most frequently appear in the area of coccyx (74%), trochanters (60%) and heels (58%).

As the main causes, the nurses mentioned: prolonged immobility (100%), long-lasting mechanical stress (80%), and improper body hygiene (58%). The nurses seemed to know less about the factors relevant to patients' state, like: limited mobility (64%), cachexia, hypoproteinaemia (50%), impurity (40%). The presence of the above factors make the bedsores creation easier.

The specially designed classification helps the assessment of bedsore hazard. Among the studied group, 80% of nurses does not know any classification. The rest knows only Douglas and Northon classification. More than half of them (58%) does not know the stages according to wound severity.

Preventive measures mentioned by the studied group included: greasing (94%), repositioning of the patient (78%), ensuring personal hygiene (72%), skin moisturizing (50%), tapping (40%) and application of talc (40%). The bedsores treatment methods are: frequent repositioning of patient (90%), increasing patient's comfort (90%), decompression of wound (80%), dressing the wound (50%) in the opinion of the studied group (*Tab. 1*).

Among many means and drugs used in bedsore prevention, the most popular and widely used remain: talc, Alantan (78%), anti-bedsore mattress (70%) and spirit (50%). It is puzzling that a small fraction of the studied group mentioned modern means like PC30V (8%), adjustable bed (4%) or pressure relieving gels (4%) (*Tab. 2*). More than a half of the polled said that there are not enough devices and medicaments at their work.

Asked to self-evaluate their knowledge concerning bedsore avoidance, more than a half of the polled (54%) evaluated it as insufficient.

According to the polled, the main source of knowledge is the Nursing School (50%) and self-education (38%). Just a fraction benefited from courses (4%), training, or conferences (8%). All polled were interested in learning more about the subject.

Only a small part of the studied group stated that at their place of work there exists Bedsore Preventive Team (10%), Bedsore Assistant (18%), or a person responsible for undertaking preventive measures in the ward (24%). These results are probably closely linked with the lack of suitable preventive standards, only 22% confirmed existence of such. In 68% of units which employed the polled group there are no bedsore avoidance workshops (*Tab. 3*).

Discussion

Available literature is very detailed but concern mostly about bedsore avoidance and prevention methods in different bedsore wound stages [2-6,8-14,17]. There are not, however, many

Table 3. **Prevention organization and bedsore treatment at the workplace of the polled nurses**

Organization structure	Yes		No		Don't know	
	Number	%	Number	%	Number	%
Anti-bedsore team	5	10	25	50	20	40
Bedsore assistant	9	18	28	56	13	26
Bedsore assistant's co-worker in the ward	12	24	38	76	0	0
Bedsore prevention standard implementation	11	22	29	58	10	20

researches on bedsore prevention directed to nurses [1,7,15,16, 18,19-21]. The topic is discussed in Ślusarska's research [19]. Studying nurses' knowledge she researched 130 nurses working in various health units in the city of Lublin. Similar research had been performed by Pawlas et al. [20] on the group of 26 nurses working at Neurosurgery Ward in the city of Bydgoszcz.

The research showed that nurses are familiar with the term "bedsore" and are aware of the causes. Their knowledge on comprehensive modern prevention was insufficient, though. The conclusion was that they base on knowledge acquired at Nursing School but do not update it. Ślusarska [19] had similar conclusions, pointing out that none of the units which employed the nurses introduced bedsore preventive standards. On the other hand, the research conducted by the team in Bydgoszcz proved good knowledge of bedsore prevention among local nurses [20]. It is significant that 100% of them confirmed the introduction of bedsore prevention standards at their workplaces. By comparison, in our research only 22% of polled made such confirmation. Research conducted at The Intensive Care Ward by Walkowiak and Koper [21] proved existence of close link between the introduction of preventive standards and the service quality.

This research confirms Ślusarska's [19] results and shows that the greatest obstacle on the way to proper prevention is lack of medicaments and devices. According to the team from Bydgoszcz, it is the lack of qualified personnel that determines the quality of bedsore prevention [20].

Year 1995 in Poland marks the beginning of bedsore prevention program implementation. The National Nursing Consultant issued regulations that were to be observed in hospital health service. The regulations imposed creation of bedsore prevention teams, registration of bedsore hazard patients and bedsore wounds patients, assessment of bedsore hazard among new patients, use of determination procedures concerning methods, means, devices in bedsore prevention, and education of patients [22].

Our results show that only a few units employing polled nurses created Bedsore Prevention Teams or appointed a person responsible for bedsore prevention in the ward. Even in hospitals where such units were organized there is a relatively large group of people unaware of their existence. What is more, the main problem seems to be lack of suitable medicaments and devices used in bedsore prevention. The patients with bedsores are registered in the wards but there are no individual records of each patient. Kruk-Kupiec [18], who conducted a similar research among 93 students, had comparable results.

Conclusions

1. The level of knowledge among studied nurses on bedsore prevention is insufficient.
2. This is probably caused by insufficient number of units where preventive actions are coordinated by suitable organizations or persons, and insufficient number and frequency of workshops and lack of hospital training on modern preventive measures and techniques.

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The value of iontophoresis combined with ultrasound in patients with the carpal tunnel syndrome

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Abstract

Purpose: **The purpose of the study was the evaluation of usefulness of iontophoresis with hydrocortisone combined with ultrasounds in conservative treatment of the carpal tunnel syndrome (CTS).**

Patients and methods: **Forty patients (35 women and 5 men), aged 30-72 years, with unilateral CTS confirmed by electromyographic examination were included. The patients were divided into 3 groups based on clinical symptoms according to Whitley [16]. Subjective complaints and objective symptoms were recorded in all patients. The character of the pain, its frequency and intensity (VAS scale) as well as paresthesies was determined. Physical examination consisted of clinical tests according to Phalen and Tinnel, sensation discriminatory test, pressure test and estimation of muscular atrophy of the thenar. All the patients underwent combined physiotherapeutic procedures: iontophoresis with hydrocortisone acetate (25 mg per procedure; galvanic current up to 5 mA, the active electrode – 50 cm^2, time – 20 min) and ultrasounds with direct coupling (the dose of 0.5-0.8 W/cm^2, 1 MHz, PIP 1:4, 48 Hz; the time 3-6 min). The number of procedures was 10 – one per day.**

Results: **Decrease of pain and paresthesia were observed in 36 patients (out of 40) with mild and moderate stage of CTS. Objective parameters (Phalen test, Tinnel test, and sensation discriminatory test) significantly improved only in 24 patients with moderate stage of CTS. There was no improvement in 4 patients with advanced form of CTS.**

Conclusions: **The use of combined procedures of iontophoresis with hydrocortisone and the ultrasound diminishes subjective complaints of patients with the carpal tunnel syndrome. The procedure is most effective in the treatment of mild and moderate stages of the disease.**

Key words: carpal tunnel syndrome, conservative treatment, iontophoresis, ultrasound.

Introduction

Carpal tunnel syndrome (CTS) consists of various clinical symptoms caused by persistent pressure on the median nerve in the region of the wrist [1]. It is a relatively common disorder, in which various possibilities of conservative treatment can be used [2-5]. One of them is the use of physiotherapeutic treatment. There are numerous suggestions concerning this kind of treatment in literature. However, they usually concern single therapeutic methods [5-12]. There are only few publications which report simultaneous using of two methods [13,14].

The purpose of the study was the evaluation of iontophoresis with hydrocortisone combined with ultrasounds in conservative treatment of the carpal tunnel syndrome.

Patients and methods

The examination was performed in the years 2004-2005 in The Department of Rehabilitation Medicine of The Medical University of Białystok after the approval of the local Committee of Bioethics. The examined group consisted of 40 patients (35 women and 5 men) in the age range 30-72 years who presented with unilateral carpal tunnel syndrome. Only patients with diagnosis of the CTS confirmed by EMG examination (performed outside the Department) were qualified for the study.

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Table 1. **Demographic data of the patients (n=40).**

Group according to Whitley	Sex	Age in years (mean ± SD)	Dominant hand	Duration of complaint in months (mean ± SD)
Gr. I (n=12)	w – 11, m – 1	52.1±12.3	w – 8, m – 1	7.2±2.5
Gr. II (n=24)	w – 21, m – 3	48.1±8.1	w – 12, m – 2	15.1±6.6
Gr. III (n=4)	w – 3, m – 1	56.5±11.4	w – 2, m –1	21.2±6.6

w – women; m – men; SD – standard deviation

Table 2. **Subjective complaints before and after physiotherapy (n=40)**

Group according to Whitley	VAS scale (mean ± SD)		Night pain (No. of patients)		Day pain (No. of patients)		Day paresthesia (No. of patients)		Night paresthesia (No. of patients)	
	b	a	b	a	b	a	b	a	b	a
Gr. I (n=12)	7.4±0.5	1.8±1.9*	10	4*	12	6*	10	3*	10	4*
Gr. II (n=24)	8.1±1.1	1.8±1.5*	23	5*	24	6*	23	5*	23	4*
Gr. III (n=4)	8.0±1.2	4.2±1.9	4	2	4	4	4	4	4	2

Legend: * – statistical significance; b – before physiotherapy, a – after physiotherapy

Motor latency above 4 ms and sensory latency above 3.5 ms were considered diagnostic of the syndrome [15].

The patients were divided into 3 groups basing on clinical symptoms according to Whitley [16]. In the majority of cases (65%), the symptoms pertained to the dominant hand (right in the right-handed). Group I (early stage of the disease) included 12 patients with minor complaints like numbness and periodical pain in the region of the innervation of the median nerve. The symptoms most often occurred at night and used to wake the patients up. Group II (moderate stage) consisted of 24 patients with continuous numbness and strong pain, mainly at night, hypoesthesia in the region of the innervation of the median nerve or weakness of short muscles of the hand. Four (4) patients from group III with advanced disease stage suffered from intensive pain, short hand muscle weakening, atrophy of the thenar muscles and significant impairment of hand function. *Tab. 1* presents demographic data of the patients.

Subjective complaints and objective symptoms were recorded in all patients. The character of the pain, its frequency and intensity as well as paresthesia was determined. The intensity of pain was rated on a commonly used 10-point Visual Analog Scale (VAS). Physical examination consisted of clinical tests according to Phalen and Tinnel, sensation discriminatory test, pressure test and estimation of muscular atrophy of the thenar [17-19].

All the patients underwent physiotherapeutic procedures delivered at the region of the wrist. The first procedure was iontophoresis with hydrocortisone acetate in the dose of 25 mg per procedure, which was introduced using galvanic current with the intensity of up to 5 mA and the surface of the active electrode – 50 cm^2. The time was 20 min; the number of procedures was 10, one per day. The second procedure was the ultrasound with direct coupling (gel) in the dose of 0.5-0.8 W/cm^2, 1 MHz, PIP 1:4, 48 Hz. The time varied from 3 to 6 min. Ten procedures were carried out, one per day.

Clinical evaluation was carried out twice: before and after physiotherapy. Continuous variables were expressed as mean ± standard deviation. Statistical hypotheses were tested with independence chi^2 test for counts and with Wilcoxon matched--pairs signed-ranks test for continuous variables. All data were computed using statistical software SPSS 8.0 PL. Probability values of 0.05 were considered to indicate statistically significant differences.

Results

The most distinct decrease in pain (both day and night pain) and paresthesia were observed in group I after completing therapeutic procedure. The change was statistically significant (chi^2 test, $p<0.05$). The pain measured in the VAS scale also decreased in a significant degree (Wilcoxon test, $p<0.05$). Group II revealed similar changes. In group III there was no improvement.

As far as objective parameters are concerned (Phalen test, Tinnel test, discriminatory test), a statistically significant improvement was noted only in group II (chi^2 test, $p<0.05$). There was no improvement in group I and III.

Tab. 2 and *3* present evaluated parameters and their values before and after the treatment.

Discussion

Physiotherapeutic procedures in the treatment of the carpal tunnel syndrome have been reported only by a few reports, which usually consider the use of single physiotherapeutic method [6,8,9,11,12]. The use of combined methods has been mentioned less frequently [13,14].

In our study we have evaluated the usefulness of ionthophoresis combined with ultrasounds which has been not reported so far. We have noted the improvement of mainly subjective symptoms in all but 4 patients. They usually reported decreased pain and paresthesia at night and improvement of function of

Table 3. **Clinical tests before and after physiotherapy (n=40)**

Group according to Whitley	Phalen test (No. of patients)		Tinnel test (No. of patients)		Sensation discriminatory test (>1mm) (No. of patients)		Pressure test (No. of patients)		Athrophy of the thenar muscles (No. of patients)	
	b	a	b	a	b	a	b	a	b	a
Gr. I (n=12)	10	7	8	7	0	0	8	7	0	0
Gr. II (n=24)	23	17*	23	17*	11	6*	23	17*	0	0
Gr. III (n=4)	4	4	4	4	4	3	4	4	2	2

Legend: * – statistically significance; b – before physiotherapy, a – after physiotherapy

the hand during daily activities. Nevertheless, the statistically significant improvement of objective parameters was observed only in patients with moderate symptoms of the disease. Evaluated parameters did not change in the group of patients with severe symptoms of CTS. Despite of this, the patients from this group reported satisfaction with the treatment, though this was difficult to evaluate in an objective way.

Our study again confirmed the usefulness of physiotherapeutic methods in the treatment of non-advanced forms of the carpal tunnel syndrome. Possibly, the synergism of anti-inflammatory action of hydrocortisone and the ultrasound can be mechanism of the improvement. The combination of two methods is thought to decrease edema in the tissues surrounding the median nerve which facilitates nerve conduction.

Our results seem to be at least comparable to those obtained by other authors dealing with similar groups of patients [6-9,11,12]. In our opinion physiotherapeutic procedures should be used in combination. Such arrangement can be suggested for patients with mild and moderate symptoms of CTS. It can be also useful in patients who refuse surgical treatment. Patients with the advanced stage of the carpal tunnel syndrome will not benefit from physiotherapeutic procedures and should be referred for operative treatment.

Conclusions

1. The use of combined procedures of iontophoresis with hydrocortisone and the ultrasound diminishes subjective complaints of patients with the carpal tunnel syndrome.
2. The procedure is most effective in the treatment of mild and intermediate stages of the disease.

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The problem of pain evaluation in the process of nursing care in thoracosurgical patients and in general surgery

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Abstract

Postoperative pain causes numerous disorders in systemic homeostasis. It may result in various complications prolonging the period of convalescence and making the rehabilitation difficult, or even being dangerous to life. A nurse becomes irreplaceable in the process of pain evaluation just after surgical procedures since the pain intensity constitutes the basis for later treatment decisions. The aim of the research is the evaluation of postoperative pain in patients after thoracic and abdominal surgical procedures. 50 thoracosurgical patients and 50 general surgical patients were involved in the research. Patients were selected at random. A visual-analogue scale was used for pain evaluation and the categorisation table was used for the evaluation of patients' self-care ability. Statistical analysis was performed by means of STATISTICA 6 package (StatSoft, Inc). The results prove that in thoracosurgical patients pain intensity is lower and there is no dependence on the operation performed, as in the case of patients after surgical procedures within the abdominal cavity. Statistically significant differences were observed between groups of patients and the analgesic drugs used as well as pain intensity. The evaluation of patients' self-care ability does not depend on the intensity of pain declared by patients.

Key words: pain, self-care, categorisation.

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Introduction

Nowadays, postoperative pain treatment is a routine procedure. Unfortunately, such a routine leads to situations when doctors are no longer interested in treatment efficiency. Thus, postoperative pain constitutes a constant medical problem area and still is very often improperly treated. It is located in a hollow between the peaks of operation and complications. This space is often unnoticed by surgeons, yet this is the time when the postoperative complications appear and develop. The most common complications are: circulatory or respiratory disorders, difficulties in the passage of chyme, disorders with a decrease in immunity [1-3]. Postoperative pain causes numerous disorders in systemic homeostasis. It may result in various complications prolonging the period of convalescence and making the rehabilitation difficult, or even being dangerous to life. Pain caused complications may be dangerous for a patient particularly after thoracosurgical operations. Shallow breathing leads to ventilation impairment, the development of atelectasis, it also increases the risk of pneumonia. It is worth remembering that systemic reaction to pain expresses in an increase of thrombocytes adherence and fibrinolysis drop, which in the case of slower venous blood flow (in patients afraid of moving because of pain) promotes thromboembolic complications [4,5]. Long lasting pain takes complete control of a patient's mind, leading to depression, anxiety and physical exhaustion resulting for instance from the lack of sleep [6]. Pain evaluation is extremely important with regard to a precise pain characteristic and the assessment of the extent to which pain influences patients' physical condition and the degree to which it constitutes the element of suffering [7,8]. A nurse becomes irreplaceable in the process of pain evaluation just after surgical procedures. Both the character and the intensity of pain should be evaluated by a nurse at first because of her constant presence and proper communication with a patient. Pain intensity constitutes the basis for later treatment decisions. It indicates how quick the reaction should be, which drug should be instituted and it also determines the way of drug administration.

Table 1. **Patients' age vs the analysed group**

Age	Thoracosurgical patients		General surgical patents		Total	
	N	%	N	%	N	%
<50 years old	18	36	25	50	43	43
51-70 years old	25	50	15	30	40	40
>71 years old	7	14	10	20	17	17
Total	50	100	50	100	100	100

U Mann-Whitney test p=0.479

A nurse, while administering analgesics has to observe a patient, realise his/her needs or identify any abnormal behaviour. Strict following a schedule of analgesic drugs administration by nurses and doctors' quick reactions to nurses' and patients' suggestions are the necessary conditions of a successful treatment. In the process of nursing care, to evaluate the postoperative pain, the Visual Analogue Scale (VAS) may be used effectively. Using this scale, as well as the questionnaire of a life quality evaluation – ESAS (The Edmonton Symptom Assessment System) has an additional, psychological meaning. Giving pain the value of a number makes it 'visible' for doctors and nurses and improves the communication in the patient – nurse – doctor relationship. Suggestions concerning pain intensity should be taken into consideration by nurses while the evaluation of patient's self-care abilities [9,10,11]. The aim of the research is to evaluate postoperative pain in patients after thoracic and abdominal surgical procedures and to analyse the following research problems: 1) is there a relationship between pain evaluation and the analysed group of patients, 2) is there a relationship between type of an operation, 3) is there a relationship between a schedule of analgesic drugs administration, and 4) does the pain intensity declared by patients' influence nurses' evaluation of patient's self-care abilities.

Material and methods

The research involved 100 patients, 50 of them were operated on in The Clinic of Thoracic Surgery of The Medical University of Gdańsk and the other 50 were operated on in the Thoracic Surgery Word of a hospital in Łódź, the head of a hospital department: X. Patients were selected at random. Among the thoracosurgial patients there were 37 (74%) men and 13 (26%) women; among general surgical patients there were 18 (36%) men and 32 (64%) women. The complete group comprised 55 (55%) men and 45 (45%) women – (Chi-square =14.52; p<0.001). The patients' age was analysed according to age groups: up to 50 years old, between 51 and 70 years old, above 71 years old. The situation is presented in *Tab. 1*.

A visual-analogue scale was used for pain evaluation and the categorisation table was used for the evaluation of patients' self-care ability. Pain was measured twice a day, at the stated times (10.00 a.m., 6.00 p.m.) during the first three days after a surgical procedure. At the same times nurses measured patients' self-care abilities by means of the IV-degree categorisation table. Statistical analysis was performed by means of STATISTICA 6 package (StatSoft, Inc). Statistical description was produced with the use of the mean, statistical deviation and frequency. Statistical conclusion depending on the scale and distribution type was made by means of t-Student, ANOVA, Scheffe post-hoc test, chi^2 and r-Spearman nonparametric correlation.

Results

Among the thoracosurgial patients in 9 cases (18%) there was a lung excision, in 23 cases (46%) a lung lobe excision and in 2 cases (4%) patients were operated on because of pneumothorax. Among the general surgical patients in 40 cases (80%) there was a cholecystectomy, in 4 cases (8%) an exploratory laparotomy was performed, in 2 cases (4%) there was an intestine resection, and in 4 cases (8%) there was a stomach resection performed. *Fig. 1* presents the mean values of pain in the analysed groups. T-Student test revealed differences in subsequent measurements: measurement 1 – p=0,81, measurement 2 – p=0.20, measurement 3 – p=0.96, measurement 4 – p=0.73, measurement 5 – p=0.18, measurement 6 – p=0.91. Two-factor analysis of variance (ANOVA), with a group of patients (after thoracic surgical procedures; after abdominal surgical procedures) and measuring time (measurements 1-6) functioning as the independent variable and VAS measurments' results functioning as the dependent variable – revealed the difference p<0.001. The mean pain value in the analysed groups did not depend on age, sex or the kind of surgical procedure. The scheme of an analgesic treatment in thoracosurgical patients is presented in *Fig. 2*. The scheme of an analgesic treatment in general surgical patients is presented in *Fig. 3*. Among the thoracosurgical patients the most commonly used drugs combination was Dolargan scheduled with Ketonal or Dolargan scheduled with Pyralgin. In general surgery such analgesics as Pyralgin, Tramal and Ketonal dominate. Mann-Whitney U test revealed differences between the instituted analgesic treatment and the analysed groups in all 6 measurements at the level of p<0.001. After the 1st and 2nd measurements of the thoracosurgical patients all of them were evaluated as completely incapable of self-care and were classified to category IV, in the 3rd measurement 90% of the patients were classified to category III and the remaining 10% were still in category IV. After the 4th measurement 99% of the patients were in category III, and in the 5th and 6th measurements all of the patients were classified to category III. Among the general surgical patients, similarly to these in thoracosurgery, in the 1st and 2nd measurements all the patients were classified to category IV. After the 3rd measurement 50% of the patients were in category III and 50% in category IV. In the next measurement 89% of the patients were in category III and 11% in category IV. Next measurements resulted in 99% of the patients classified into care category III. Mann-Whitney U test revealed differences between the evaluation of categorisation and the analysed group in the 3rd measurement: measurement 1 – p=1.00, measurement 2 – p=1.00, measurement 3 – p=0.009, measurement 4 – p=0.730, measurement 5 – p=1.00, measurement 6 – p=1.00. No statistically significant differences between the evaluation of the patents' self-care abilities and pain were observed in the analysed group.

Figure 1. **The mean value of pain in the analysed groups**

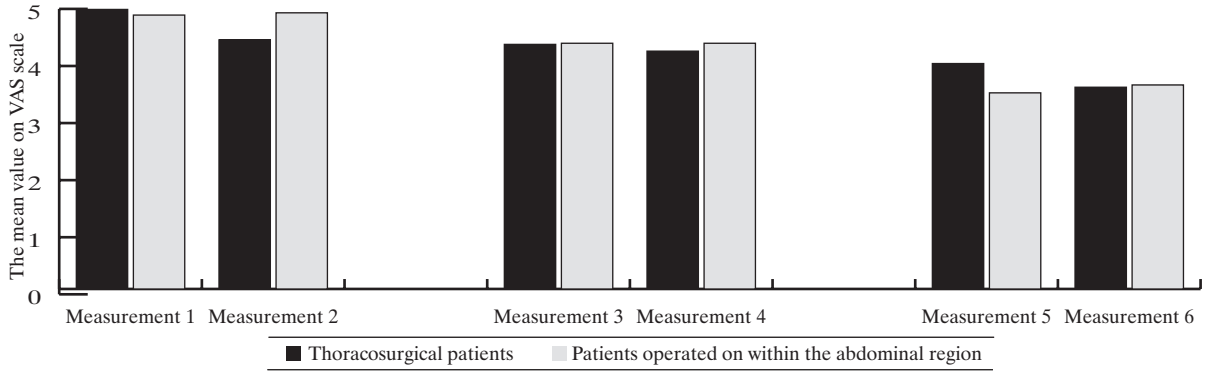
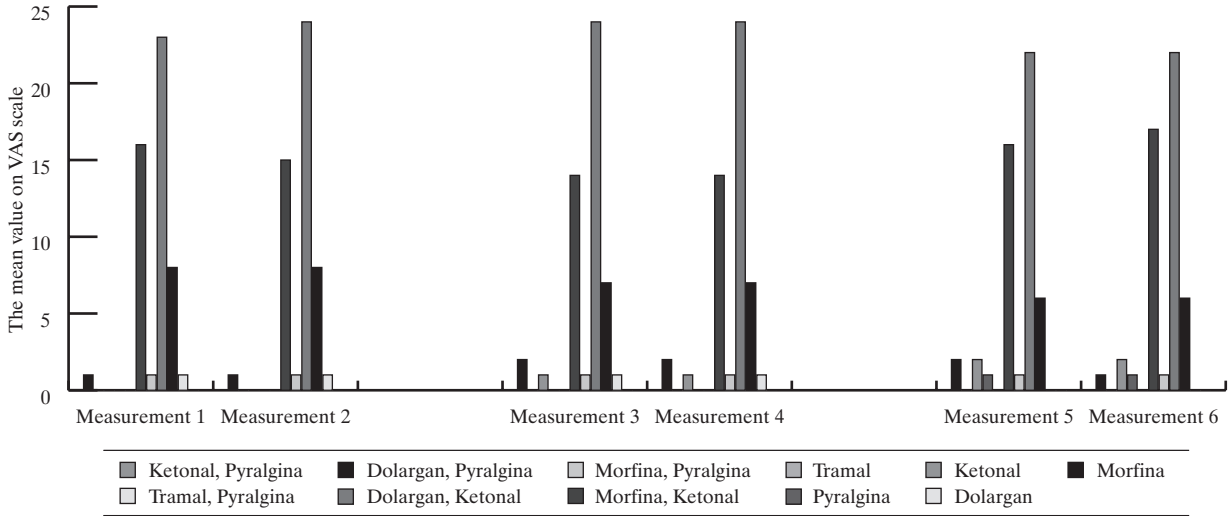


Figure 2. **Drugs used in the thoracosurgical ward**

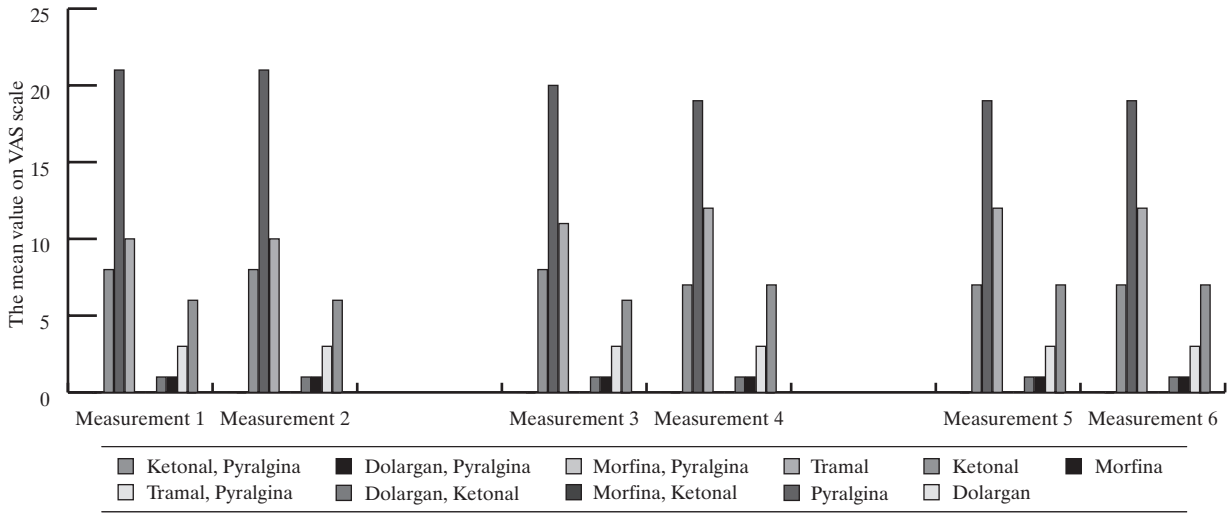


	Measurement 1	Measurement 2	Measurement 3	Measurement 4	Measurement 5	Measurement 6
Morfina	1	1	2	2	2	1
Dolargan	0	0	0	0	0	0
Ketonal	0	0	1	1	2	2
Pyralgina	0	0	0	0	1	1
Tramal	0	0	0	0	0	0
Morfina, Ketonal	16	15	14	14	16	17
Morfina, Pyralgina	1	1	1	1	1	1
Dolargan, Ketonal	23	24	24	24	22	22
Dolargan, Pyralgina	8	8	7	7	6	6
Tramal, Pyralgina	1	1	1	1	0	0

Discussion

There exists a commonly accepted opinion that pain evaluation by patients is the only useful criterion of treatment assessment [1,7,9]. For both practical and scientific purposes it is necessary in everyday nursing practice to use the methods which allow to compare the intensity of pain in various moments of postoperative care. In spite of the fact that in recent years a growing interest in the problem of postoperative pain relief can easily be noticed [3-5], nurses, in the process of nursing care do not use available methods as a routine [10]. To achieve this a systematic pain measurement is necessary, such as in the case of routine measuring of pulse, arterial blood pressure or temperature. What is needed for an effective control of postoperative pain, apart from a skilful administering of drugs adjusted to a character and intensity of pain, is a tender nursing care of patients [6,8,11]. The analysis carried out in the above research concerning two distant medical centres and different groups of patients show that the problem of pain evaluation in the process of nursing care and treatment still exists. An intentional choice of groups of different operative treatment and postoperative care specificity made it possible for certain tendencies in the routine approach to the analysed issue to

Figure 3. **Drugs used in the general surgical ward**



	Measurement 1	Measurement 2	Measurement 3	Measurement 4	Measurement 5	Measurement 6
Morfina	0	0	0	0	0	0
Dolargan	0	0	0	0	0	0
Ketonal	8	8	8	7	7	7
Pyralgina	21	21	20	19	19	19
Tramal	10	10	11	12	12	12
Morfina, Ketonal	0	0	0	0	0	0
Morfina, Pyralgina	0	0	0	0	0	0
Dolargan, Ketonal	1	1	1	1	1	1
Dolargan, Pyralgina	1	1	1	1	1	1
Tramal, Pyralgina	3	3	3	3	3	3
Ketonal, Pyralgina	6	6	6	7	7	7

be noticed. The obtained results contradict a common belief that the pain after thoracosurgical procedures is more severe than after general surgery procedures [3]. The research authors emphasize an important aspect in the treatment of postoperative pain – a patient – nurse – doctor relationship. The process of treatment and nursing care, particularly in surgical wards, has to be realised in a therapeutic team with nurses also taking part in it. A worth noticing fact is that nurses while evaluating patients' self-care abilities pay too little attention to pain-related complaints reported by patients.

Conclusions

Patients after thoracosurgical procedures feel less pain than after the procedures within the abdominal region. This theory should be explored in further research. The differences between the intensity of pain and the applied analgesic treatment in thoracosurgical and general surgery patients indicate the necessity of a detailed analysis concerning the procedures of analgesic treatment used in the wards. While evaluating patents' self-care abilities nurses should pay more attention to pain-related complaints made by patents, and using the VAS scale for pain evaluation should become a routine during the nursing care process of patients after surgical procedures.

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Surgical nurses and their concerns of acquiring HIV infection at the workplace

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Abstract

A study was conducted to identify pertaining to the care of HIV infected patients among nurses in the County of West Pomerania.

Most of the respondents (43.2%) were working in municipal hospitals, 38.7% in hospitals located in the country and 18% in academic hospitals. The responding nurses ranged in age from 20 to 58 (median 38 years). Median of work experience was 16 (1-28) years. The respondents were divided into 3 groups: A – the nurses who expressed serious concern about HIV infection, 62.9%; B – some degree of concern, 31.3%; C – not concerned, 4.3%. An HIV/AIDS workshop was attended by 74.6% of respondents from group A and 76.6% from group B ($p>0.85$). The occupational exposure reported 49.5% nurses from group A, 39.9% from group B and 42.4% from group C ($p>0.3$). The gloves were "always" used by 82.5% respondents from group A, 87.8% from group B and 76.9% from group C ($p>0.07$). 79.9% of nurses from group A, 53.2% from group B and 42.3% ($p<0.0001$) favored HIV antibodies testing of all patients.

Key words: Nurses' concerns, HIV, occupational exposure.

Introduction

There is no doubt that the number of people living with HIV (human immunodeficiency virus) is increasing in Poland and all over the world year by year and many of them would need hospital treatment [1-4]. Surgical nurses have been shown to have higher incidence of exposure to patient's blood compared with nurses from some other wards [1-3,5]. So it seems natural that, in the context of transfer of HIV in this very way, they are concerned about acquiring the infection. The first case of occupational HIV infection among health care workers (HCWs) was documented in 1984. Since then, about 300 HIV infections among this group have been reported, most of these were found in nurses [1,2,6,7].

Even though HCWs are much more likely to be infected by hepatitis viruses as a result of taking care of an infected patient, they tend to be much more concerned about becoming infected with HIV [8-11]. There are several reasons for this increased concern. Virtually all individuals infected with HIV eventually develop AIDS (acquired immune deficiency syndrome). Despite the antiretroviral treatment and the treatment of opportunistic infections, AIDS is uniformly fatal. It has been also proved that, even during asymptomatic period of this infection, the quality of life keeps getting worse. HIV infection has, for many individuals, adverse social implications and can result in loss of job, family, friends, as well as in the stigmatisation or negative valuation [4,12].

The cumulative risk of occupationally acquired infection is determined primarily by three factors: the population seroprevalence, the risk of seroconversion after an exposure and the type and cumulative frequency of exposures to blood [1-3,6,7].

The risk of occupational HIV infection is actually rather low, but real. After a percutaneous exposure it has been estimated as 0.3% or 1 in 333 [1-3]. On average 99.7% of HCWs who are exposed to HIV will not be infected. For mucous membrane exposure the risk is 0.09%, but for non-intact skin even less. From the three risk factors mentioned above, the only one that can be controlled by nurses is the frequency of exposures. It can be achieved by implementing safety devices and safer workplace practices, using protective equipment, and educating the medical personnel about blood transmitted infections [1-3,5-7].

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We wanted to investigate how the years in practice, the type of hospital, the number of HIV infected patients under care, the HIV/AIDS special training attendance and the number of sharps injuries sustained per year influenced HIV concerns among this job category. The purpose of this study was to determine the concerns for acquiring HIV infection at workplace among the nurses from surgical wards from the randomly selected hospitals in the County of West Pomerania.

Material and methods

A representative group of 601 nurses from 7 hospitals located in the city of Szczecin (2 university, 5 municipal) and 11 located in the County of West Pomerania took part. An anonymous questionnaire prepared by the authors according to the guidelines of A. Lowenfels from N.Y. Medical College, USA, was distributed by mail, with an adequate instruction, between January and March 2003.

The questionnaires were sent to 601 active nurse staff, 9 of them were eliminated because they were not complete. Minimal of sample size (n=556) of the finite general population nurses employed in health service institutions in West Pomeranian (N=7495) for the day the 31.12.2002 according to Statistics Bulletin of Health Ministry of 2003 was stated at arbitrary chosen sizes half interval confidence (not over for 4%) and basing on definite level of confidence =0.95, if unknown variance of fraction of examined variable got the maximum value. To this analysis have been included all fill in inquiry forms in number of 592. In this way the condition required minimal of sample size has been fulfilled.

The survey consisted of two sections. The first section asked for demographic data. The second section identified the level of fear of acquiring HIV infection at work, occupational exposure to HIV infectious, use of gloves when in contact with potentially infection material and the expectations towards testing patients for HIV antibody. Between group differences were determined using χ^2 test and U Mann-Whitney's test. Differences were considered as statistically significant at p=0.05.

Results

Almost half of the respondents (257/601; 42.8%) practiced in municipal hospitals, 229 (38.7%) in hospitals situated in the country and 115 (18%) in university hospitals. The responding nurses ranged in age from 20 to 58 (median 38 years), mean work experience was 16 years (range 1-28 years). For the majority of respondents (565; 94%) it was a full-time job. Almost three-fourths (450, 74.9%) participated in HIV/AIDS workshop.

Over one-fourth of the nurses (162; 27.3%) had one or more occupational contacts with HIV infected patients during their professional carrier. Almost one half of respondents (276, 46%) reported at least one puncture injury in the preceding year.

After eliminating 9 questionnaires, incomplete regarding responses about the level of fear of acquiring the HIV infection at work, the respondents were divided into three groups. Group A – the nurses expressed serious concern about HIV infection (378; 62.9%); group B – some degree of concern about HIV infection (188; 31.3%); group C – were not concerned (26; 4.3%).

No differences (p>0.17, U Mann-Whitney's test) in the median of years at practice between the groups: A-17, B-16, and C-15 were found. In the group A – 102 (27%) respondents had at least one professional contact with HIV infected patient, in the group B – 40 (21%; p>0.85).

In the rural hospitals 177 (77.3%) nurses from the total of 229 were much concerned about acquiring HIV infection at work, in the municipal hospitals – 150 (58.6%) and in university hospitals 51 (47.7%); the differences statistically significant (p<0.02). The number of nurses who expressed some degree of concern about HIV infection was: in academic hospitals 48 (44.9%) respondents, in municipal hospitals 90 (35.2%) and in rural hospitals 50 (21.8%). The significant differences were between rural and municipal hospitals and also between rural and academic hospitals (p<0.02).

An HIV/ AIDS workshop had been attended by 282 (74.6%) nurses from group A, by 144 (76.6%) from group B and by 17 (65.4%) from group C. The differences between the groups were not significant (p>0.21). Data are presented in *Tab. 2*.

In the group A, almost one half of respondents – 187 (49.5%) had the occupational percutaneous contacts with blood in the preceding year. The median for this kind of contacts was 2. In the group B – 75 nurses (39.9%) had such type of contacts (median number for the contacts 3), and in group C – 11 (42.3%, median number for the contacts 2). The differences between the median number of percutaneous contacts in three groups were not significant (p>0.21, U Mann-Whitney's test).

In the group A – 50 respondents (26.7%) reported blood exposure, in the group B – 19 (25.3%) and in the group C – 5 (45.5%; p>0.3; data in *Tab. 2*). Almost one-third (46; 32.2%) of respondents from the group A was not convinced about patient's infectivity, above half (30; 50.8%) from group B and from group C. The significant differences were between group A and B: p<0.02. Some of the respondents were convinced that even if they reported the occupational exposure to HIV/AIDS it would not help to avoid the infection (group A – 43; 30.1%; group B – 13; 22%, group C – 2; 25%; p>0.24).

The vast majority (312; 82.5%) of respondents from the group A, 165 (87.8%) from the group B and 20 (76.9%) from the group C claimed that they always used protective gloves when in contact with potentially infected material (p>0.07). The *Tab. 3* shows the reasons why the nursing staff is not "always" using the personal protective equipment.

About one-third of nurses (56; 29.8%), who expressed some degree of concern about HIV infection and 67 (17.7%) who were seriously concerned, were convinced that the patient was not the source of HIV infection and they did not follow the protective procedures (p<0.002).

Because of skin abrasions and cuts, 215 (56.9%) respondents from the group A were exposed to potentially HIV infected material, 87 (46.3%) from the group B and 12 (46.1%) from the group C. The difference was significant between group A and B (p<0.002).

Most of the respondents (302, 79.9%), who were seriously concerned about HIV infection, claimed they should know the

***Table1*. Relations between employment place of respondents and their concerns of acquiring HIV at work**

	Place of employment					
	Rural hospitals (n=229)		Municipal hospitals (n=256)		University hospitals (n=107)	
Level of concerns	**n**	**%**	**n**	**%**	**N**	**%**
Serious concern Group A	177	77.3[1]	150	58.6[1]	51	47.7[1]
Some degree of concern Group B	50	21.8[2]	90	35.2[2]	48	44.9[2]
Not concerned Group C	2	0.9	16	6.2	8	7.5

Indexes 1 and 2 mean statistically significant differences (χ^2 test).
[1] $p<0.02$; [2] $p<0.002$

***Table 2*. Occupational behaviours of nurses vs their concerns of acquiring HIV at work**

	Concerns					
	Serious concern Group A (n=378)		Some degree of concern Group B (n=188)		Not concerned Group C (n=26)	
Variable	**n**	**%**	**n**	**%**	**n**	**%**
HIV/ AIDS workshop	282	74.6	144	76.6	17	65.4
Occupational percutaneous contacts with blood in the preceding year	187	49.5	75	39.9	11	42.3
Reported blood exposure	50	26.7	19	25.3	5	45.5

***Table 3*. Reasons for not using regularly the personal protective equipment by concerns of acquiring HIV at work**

	Concerns					
	Serious concern Group A (n=378)		Some degree of concern Group B (n=188)		Not concerned Group C (n=26)	
Reasons	**n**	**%**	**n**	**%**	**n**	**%**
Lack of time	59	15.6	15	8	2	7.7
No accesibility	102	27.0	40	21.3	3	11.5
Not comfortable	78	20.6	36	19.1	9	34.6
Not effective	27	7.1	10	5.3	1	3.8
The patient is not a source of infection	67	17.7[1]	56	29.8[1]	6	23.1

[1] $p < 0.002$ (χ^2 test)

***Table 4*. Nurses' opinions on patients' HIV testing by concerns of acquiring HIV at work**

Level of concerns	All patients admitted to the hospital				Preoperative testing			
	yes		no		yes		no	
	n	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Serious concern group A	302	79.9[1,2,3]	76	20.1[1]	365	96.3[4,7,8]	13	3.7[4]
Some degree of concern group B	100	53.2[2]	88	46.8	166	88.3[5,7]	22	11.7[5]
Not concerned group C	11	42.3[3]	15	57.7	22	84.6[6,8]	4	15.4[6]

Indexes 1,2,3,4,5,6,7 and 8 mean statistically significant differences (χ^2 test).
[1,2,3,4,5] $p < 0.0001$; [6] $p < 0.001$; [7] $p < 0.002$; [8] $p < 0.02$

serological status of the patient, 76 (20.1%) were against it; the difference was statistically significant ($p<0.0001$). Data are presented in *Tab. 4*. Most of the respondents (553; 93.4%) favored preoperative HIV antibody testing of patients. Significant differences between group A and B ($p<0.002$) and between group A and C ($p<0.02$) were found.

Discussion

There is a serious fear about nursing HIV positive patients among our respondents, especially nurses from rural hospitals. The degree of fear does not depend on the duration of practice or the number of HIV positive patients cared for. Our results are comparable to earlier studies [9,10,13-16].

Of the nurses included in our survey who declared serious fear of acquiring HIV infection at work, 49% sustained at least one injury with sharps during the past 12 months. In view of the high prevalence of fear and of a history of sharps injury among nurses, it would be advisable to recommend adherence to all the standard precautions during patient contacts. During simulated needlesticks by hollow-bore needles it has been proven that gloves decrease the exposure volume an average by 50% [7,17]. Nevertheless, our results show that the fear of the infection does not result in better safety practices when dealing with potentially infectious body fluids. Among nurses with a serious fear of HIV infection, 83% regularly used gloves when dealing with the procedures involving body fluids. Studies in New Zealand and Taiwan found that 49% and 76% respectively of nurses always used gloves in such procedures [9,10]. Similar results to Taiwan's study were obtained by Beniowski [18] in his research on behavior of Polish medical staff.

Unfortunately, in our study lack of gloves and other protective equipment is the main reason that nurses with a fear for acquiring the HIV infection at work reported for not following standard precautions. Although extra expenses will be required, this is the easiest obstacle to overcome. Despite their concerns, 48% of respondents do not use regularly personal protective equipment because they believe that source-patient is not infected. The implication is that a large segment of nurses

exposed to a patient of unknown HIV status assume that the patient is HIV negative. This is a serious finding, in light of the international principles of standard precautions, mandating that all patients should be considered infectious [1-3,6,7].

Additionally, over half of the nurses with a serious fear of acquiring HIV infection at work admit they worked with skin abrasions on their hands at least once during the preceding 12 months. This behavior increases the risk of transmission of the HIV infection [1-3,6,7,11,12].

In our previous study [11] we found that the most frequent source of injury (63%) among nurses was hollow-bore needles. These needles contain a relatively large amount of infectious material. In spite of their fear of acquiring HIV, almost three--fourths of respondents did not report sharps injuries, mainly because they were not convinced about the patient's infectivity. Such behavior deprives the nurses of appropriate post exposure prophylaxis.

Among the respondents seriously concerned about HIV infection, 96% favored preoperative HIV antibody testing. While in some countries results similar to ours have been reported, most studies reported that 50% or less of nurses favoured preoperative testing [1-3,5,9,18]. The prevalence of people living with HIV in Western Europe and North America is generally higher than in Poland, so it is evident that the risk of exposure to HIV infected patients for Polish nurses is lower than for nurses working in the countries such as USA, UK or France. Accordingly, less fear of occupationally acquired HIV infection should be felt by Polish nurses, fewer should favor preoperative screening. The reality of the situation is different. This could be due to the lack of adequate training or education or/and to lack of personal protective equipment.

It has been proven that fear of contracting HIV at work applies to most health care workers. It has been reported that lack of knowledge about the risk of infection and of appropriate post-exposure prophylaxis is the main reason for such fear [4,9,10]. What is remarkable, is that one-fourth of our respondents had never attended special training for HIV/AIDS. Hence such training must be intensified. Testing of patients for HIV infection has not been proven effective as a method to decrease the risk of occupational infection. In one frequently cited study, it was reported that knowledge about patient's HIV status made no difference to the incidence of exposures to blood among operating team [5].

Contact with blood is still frequent among surgical nurses. Despite increased fears of occupationally acquired HIV infection, nurses have not adopted standards of safety precautions to minimize contact with potentially infectious material. Furthermore, nurses do not report exposures and continue to believe that preoperative HIV testing of patients is the best way of avoiding infection.

In the surgical suit there is no place for exaggerated fear. A key factor in assuring the well-being of nurses is their personal knowledge and safety practices. The greatest danger is not the patient itself, but the nurse's lack of adequate perceptions of potential risk of acquiring the HIV infection.

Conclusions

Despite increased fears of occupationally acquired HIV infection, nurses have not adopted standards of safety precautions to minimize contact with potentially infectious material. Furthermore, nurses do not report exposures and continue to believe that preoperative HIV testing of patients is the best way of avoiding infection. Surgical nurses should receive effective training for HIV/AIDS and safety work practices to minimize the fear of occupational HIV infection.

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Assessment of quality of life, pain and effectiveness of treatment in palliative care patients

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Abstract

Purpose: Evaluation of quality of life, appraisal of pain quality and intensity, assessment of treatment and care effectiveness in palliative care patients treated at the in-patient Palliative Care Department in Częstochowa Province Hospital.

Material and methods: The study was performed in 50 randomly chosen patients at the in-patient Palliative Care Department in Częstochowa Province Hospital. The studied group comprised 22 women and 28 men. The trial lasted since October 2003 till April 2004 and this was longitudinal study. At the first assessment patients filled Modified Sheet Pain Assessment, Support Team Assessment Schedule (STAS) and Rotterdam Symptom Checklist (RSCL). At the second, third and fourth appraisal patients filled RSCL and STAS.

Results: In patients surveyed by STAS at the second assessment 52% of patients achieved very high scores (poor effectiveness of treatment and care), 32% high scores – unsatisfactory treatment and care, 15% average results (average treatment and care). Results of RSCL indicate for decrease in physical activity and global quality of life of terminal patients. At the fourth assessment after 4 weeks of the treatment nearly 80% patients assessed their physical state as low.

Conclusions: The results indicate that patients have poor performance status, no effective treatment is provided, psychological state is significantly impaired, and patients were forced to resign from social life because of cancer progression.

Key words: pain, quality of life, satisfaction from care, terminal phase of the disease.

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Introduction

The value of research concerning quality of life in medical sciences particularly in oncology and palliative medicine is increasing [1]. The main goal of palliative care is to achieve possibly the highest patients' quality of life thus quality of life assessment is mandatory [2]. Quality of life is always very subjective and to significant extent it depends on the psychological state, personality and value system. The holistic approach to the patient covering all dimensions of life is a difficult challenge for hospice-palliative care teams [3].

Aim of the study. Evaluation of quality of life, pain quality and intensity, effectiveness of treatment and care in patients treated at the in-patient Palliative Care Department in Częstochowa Province Hospital.

Material and methods

The study was performed in 50 randomly chosen patients at the in-patient Palliative Care Department in Częstochowa Province Hospital. Twenty-two women and 28 men were enrolled. The trial lasted since October 2003 till April 2004 and this was longitudinal study. First assessment (on the day of patients' admission to The Palliative Care Department) was performed in 50 patients, the second evaluation (seven days after the first assessment) was done in 46 patients, in the third assessment (after two weeks) 45 patients were evaluated, in the fourth measurement (4 weeks since the first assessment) only

Table 1. **Assessment of effectiveness of treatment and care – first evaluation (STAS)**

Assessment of effectiveness of treatment and care (symptom control, social aspects, spiritual dimension, communication)	Women		Men		Overall	
	n	%	n	%	n	%
Low (0-5 points)	0	0	1	2	1	2
Average (6-13 points)	2	4	5	10	7	14
High (14-17 points)	3	6	7	14	10	20
Very high (18-32 points)	17	34	15	30	32	64
Sum	22	44	28	56	50	100

Table 2. **Correlation of somatic dimension and global quality of life (RSCL – first assessment)**

Somatic dimension / Global Quality of life	Low 57-84	Average 49-56	High 32-48	Very high 0-31	Sum
0 Very poor	3	0	0	0	3
1 Poor	4	1	0	0	5
2 Rather poor	2	27	0	0	29
3 Average	0	8	0	0	8
4 Rather good	0	0	3	0	3
5 Good	0	0	2	0	2
6 Very good	0	0	0	0	0
Sum	9	36	5	0	50

29 patients were appraised. At the first assessment patients filled Modified Sheet Pain Assessment, STAS (Support Team Assessment Schedule) [4] and Rotterdam Symptom Checklist (RSCL) [5]. At the second, third and fourth appraisal patients filled RSCL and STAS. Szatanik elaborated Modified Sheet Pain Assessment, which is a tool designed for chronic pain assessment [6]. The items in this questionnaire can be divided for two categories: sensory and emotional. This questionnaire allows also for pain intensity evaluation. STAS covers broadly patient's situation from symptom control through social and spiritual aspects to assessment of communication quality between staff and patient, between patient and family and also between members of the team. Patients' problems and needs are assessed by 5-point scale. RSCL is a simple tool for quality of life measurement. It consists of four scales: physical symptoms scale, psychological symptoms scale, activity level and global quality of life. The majority of items are expressed in 4 point Likert scale (for symptoms and activity level). The global quality of life is assessed by 7 point Likert scale.

Results

According to STAS on the day of admission to The Palliative Care Department 64% patients had very high scores, which means that previous treatment and care was ineffective – symptom control, social aspects, spiritual dimension, and communication (*Tab. 1*). In the second assessment 52% patients had very high scores, 33% high scores – unsatisfactory care and treatment, 15% average results of care and treatment. In the third assessment 49% patients achieved very high results, which indicate poor effectiveness of treatment and care, 40% high results – unsatisfactory, 11% average results of care and treatment. According to the fourth assessment 62% achieved very high results, 31% high scores, and 7% average results.

In the first assessment of global quality of life by RSCL 58% patients evaluated as rather poor, 16% as average, 10% as poor, 6% as very poor, 6% as rather good, 4% as good. In the second assessment 59% evaluated global quality of life as poor, 28% as rather poor, 13% as very poor. In the third assessment 58% appraised their global quality of life as poor, 25% as rather poor, 18% as very poor. In the fourth assessment 55% evaluated their global quality of life as very poor, 38% as poor, 7% as rather poor. Among patients surveyed by RSCL no patient assessed global quality of life as very high.

Physical state as high was assessed in the first, second and third assessment by 10%, 9% and 11% patients respectively. Physical state as average was assessed in the first, second, third and fourth assessment by 72%, 76%, 51%, and 21% patients respectively. Physical state as low was assessed in the first, second, third and fourth assessment by 18%, 15%, 38%, and 79% patients respectively. The mentioned results of RSCL prove decreasing physical state of terminal patients. At the fourth assessment after 4 weeks of the treatment at the in-patient Palliative Care Department, 79% patients assessed their physical state as low.

Among patients surveyed by RSCL no patient assessed psychological state as very high. The result high has decreased over the study period: at first assessment – 12% of patients, at the second – 9%, at the third – 2%, at the fourth – 0%. Average psychological state was chosen by 80%, 78%, 78%, and 55% of patients in the first, second, third and fourth assessment respectively. The low evaluation of psychological state was present in 8% at first, 13% at second, 20% at third, and 45% patients at fourth assessment. To summarise the mentioned data it should be noted that patients in terminal phase of cancer assess their psychological state as average or low.

In patients surveyed by The Modified Sheet Pain Assessment 22% had strong pain, 18% moderate, 14% very strong, 14% pain as bad as one can imagine, 12% mild; 20% of patients did not report pain. Pain quality was assessed by 35% as pressing or squeezing in the sensory category; the same percentage of patients had troublesome and annoying pain in emotional category.

The analysis of dependency between somatic and global quality of life on the base of the first assessment (RSCL) is submitted in *Tab. 2*. The more somatic symptoms (57-84 points) reported by patients, the worse global quality of life. The analysis of dependency between pain intensity and global quality of life in terminal patients (Modified Sheet Pain Assessment, RSCL – first assessment, *Tab. 3*). The more severe pain reported by patient, global quality of life decreases.

Table 3. **Correlation of pain and global quality of life in terminal patients (Modified Sheet Pain Assessment, RSCL – first assessment)**

Self assessment of pain / Global Quality of life	No pain 0	Mild pain 1-20	Moderate pain 21-40	Strong pain 61-80	Very strong pain 61-80	Pain as bad as one can imagine 81-100	Sum
0 Very poor	0	0	0	0	0	3	3
1 Poor	0	0	0	2	0	3	5
2 Rather poor	0	3	9	9	7	1	29
3 Average	5	3	0	0	0	0	8
4 Rather good	3	0	0	0	0	0	3
5 Good	2	0	0	0	0	0	2
6 Very good	0	0	0	0	0	0	0
Sum	10	6	9	11	7	7	50

Discussion

Quality of life assessment comprises physical activity, somatic, psychological, social, and spiritual dimension [7]. In terminal cancer patients performance status, and the ability for self-service significantly influence quality of life. In our study physical status (assessed by RSCL) of surveyed patients at the first three assessments was usually average (72%, 76%, and 51%) and low (80%) at the forth appraisal. Palliative care patients usually are not mobile, spending most of the time in bed, especially when they are approaching death. Family and medical staff usually gives the support for these patients [8]. Appropriate treatment of physical symptoms, e.g. loss of appetite, fatigue, weakness, nausea and vomiting, breathlessness, insomnia etc. is aimed at quality of life improvement [9]. In this study the somatic state of patients during the trial deteriorated, symptoms were present with increased intensity, only sometimes were eliminated or palliated because symptomatic treatment was quite often ineffective. In the fourth assessment, patients assessed their physical state as low (80%) or average (20%). In order achieve good quality of life, it is necessary to relief pain effectively [10]. On admission 80% of patients reported pain, in spite of analgesics' administration, only 20% of patients were free of pain. Nearly 70% of patients suffered from moderate, strong, very strong or the worst imaginable pain. This clearly indicates for inappropriate treatment before patients' admission in spite of observed huge progress in pharmacotherapy of cancer pain in Poland [11]. It would be interesting to explore results of pain treatment during stay at the in-patient unit. In our study 40% of patients suffered from mild depression, 30% from moderate depression, 4% from severe depression and 26% had no depressive symptoms. Moreover we observed also high level of anxiety [12]. This is understandable taking into account poor patient prognosis, inadequate treatment of somatic symptoms and probably insufficient social support from the staff (there is no psychologist in the department).

To sum up we can conclude that majority of patients in our study had poor physical and psychological state, and many patients resigned from social life due to cancer progression. The symptomatic treatment and psychosocial support was in many patients ineffective. These problems reported by patients will serve to improve the quality of care and symptomatic treatment at the unit.

Conclusions

Physical status (assessed by RSCL) of surveyed patients at the first three assessments was usually average (72%, 76%, and 51% respectively) and low (80%) at the forth appraisal. The somatic state of patients during the study deteriorated, symptoms were present with increased intensity, only sometimes were eliminated or palliated because symptomatic treatment was ineffective. On admission most of patients reported pain, in spite of analgesics' administration, only 20% of patients were free of pain. In the assessment of psychological status 40% of patients suffered from mild, 30% from moderate, 4% from severe depression and 26% had no depressive symptoms. Patients had poor physical and psychological state, and many were forced to resign from social life because of cancer progression.

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A child with bronchial asthma – his functioning in a peer group

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Abstract

Purpose: **Aim of the study is to show problems parents have to account for in the process of treatment and their knowledge how to solve them.**

Material and methods: **Fifty girls and boys aged 5-12 years were participated in this study. The research employed an own questionnaire prepared for this particular purpose. It consisted of three parts: the first part dealt with social-demographic data, the second one with the age of a child at the onset of asthma and accompanying it problems, and finally, the third part was concerned with the knowledge of parents about asthma and its treatment at the time of exacerbation.**

Results: **Out of all children under study, 60% were boys and 40% were girls, 85% of them come from a district town and 15% from rural areas. Almost 42% of parents answered that the most frequent reaction of the peers and particularly children attending the same class to this information was understanding. Only 11% of peers were able to help the children with bronchial asthma in difficult moments.**

Conclusions: **The study has shown that hay fever and atopic dermatitis accompanying bronchial asthma markedly make their functioning among peers difficult. Bronchial asthma makes most children suffering from it resign from favorite games and plays connected with physical effort. The attitude of peers to these children can be described as indifferent.**

Key words: bronchial asthma, child, children, knowledge.

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Introduction

Human beings have suffered from bronchial asthma since the beginning of existence. The disease has reached its epidemic occurrence now and in developed countries it spreads in an alarming rate, particularly in children. This disease may have its onset at any age, but most often its beginnings can be observed in the first years of a child's life [1,2].

It is thought, at present, it is a chronic inflammatory disease manifested by variable intensity bronchi obturation characterized by attacks and exacerbations of cough, presence of wheeze, the feeling of tightness in the thorax and difficulties in breathing [1,3].

These changes are reversible but sometimes they may lead to life-threat or even death of a child. Taking care of a child with bronchial asthma demands bigger effort than in the case of a healthy one. His or her upbringing should follow the normal course as if he was as a healthy child. It must be remembered that this child cannot grow up with the burden of a serious disease and should never be in the center of continuous interest of overprotective parent, far from the peers, games and playing with other children. Parents should aim at providing the child with a joyful and happy childhood [4,5].

The care of a bronchial asthma child demands more work and effort than in the case of a healthy one but his or her upbringing ought to be absolutely normal. Very few reports in literature on the problem of children with the diagnosed bronchial asthma made us carry out a study of this issue.

The aim of the study is to show problems parents have to account for in the process of treatment and their knowledge how to solve them.

Material and methods

A survey among the parents of children with bronchial asthma was carried out in The Out-Patient Pulmonological Department of The Public Health Care Unit in Inowrocław.

Figure 1. **Coexistence the other allergic diseases in bronchial asthma children**

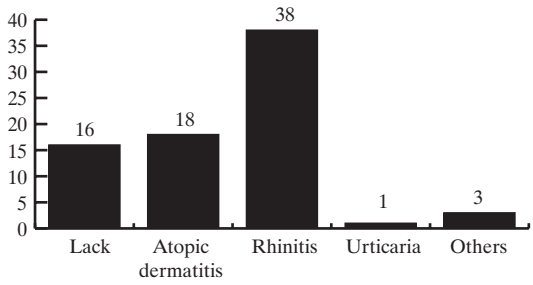
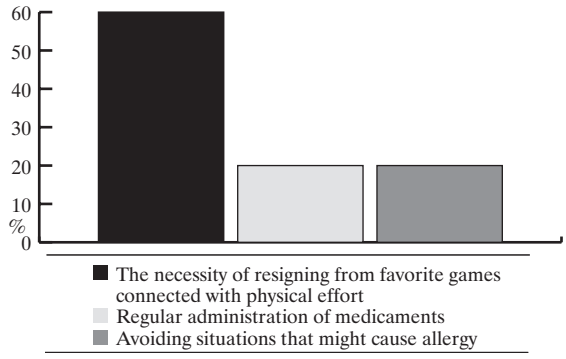


Figure 2. **The most frequent problems reported by a child at the time of well-being**



Fifty girls and boys aged 5-12 years were qualified for the study. The most numerous group was 8-year-old boys – 42% of all children under study.

The study employed an own questionnaire prepared for this particular purpose. It consisted of three parts: the first part dealt with social-demographic data, the second one with the age of a child at the onset of asthma and accompanying it problems, and finally, the third part was concerned with the knowledge of parents about asthma and its treatment at the time of exacerbation.

Results

Out of all children under study, 60% were boys and 40% were girls, 85% of them come from a district town and 15% from rural areas.

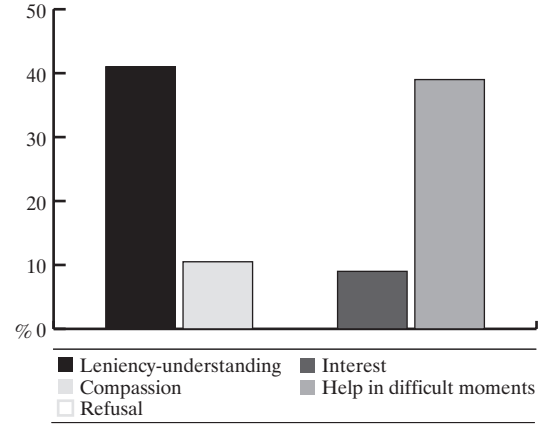
The family history of asthma was very important for the study. It turns out that in the majority of cases-as many as 96% – there were no documented incidents of asthma in the closest family or past generations. In 4% of the cases only – boys living in towns – the fathers suffered from asthma. In the examined group, 43% of children had the onset of asthma between the 5th and 9th year of life. In 27% of cases, it was diagnosed at the age 1 to 4 years, and in 3% of cases when children were 11.5 years old.

The studies and their analysis show that in 38 (76%) of cases asthma was concomitant with hay fever, and more rarely with atopic dermatitis – 18 (36%). Lack of any concomitant disease was noted in 16 (32%) children. Urticaria was found in one child only. In a group of 11% of children, parents reported allergy to antibiotics from the penicillin group and Biseptol. No allergy to medicaments was confirmed in the remaining 89% of children (*Fig. 1*).

The authors were interested in what posed biggest problems for children at the time of well-being. What, according to them, prevented them from normal functioning at the time when they do not feel any ailments connected with the disease? The majority of parents – 60% think that the necessity of avoiding favorite games and plays connected with physical effort is a serious limitation for children and does not let them have normal relationships with peers. These limitations disturb the emotional development of a child and they also affect the social development of their children (*Fig. 2*).

Interesting results were obtained when analyzing the answers to the question "What was the reaction of peers when they learned about your child's disease?" The majority of parents, 42%, answered that the most frequent reaction of the peers and particularly children attending the same class to this information was understanding. According to the parents and their children, the peers accepted the information about the disease but at the time of exacerbation or attacks of the disease they were indifferent and could not react properly or inform a teacher and parents about the incident. Only 11% of peers were able to help them in difficult moments. They were mostly 11 or 12 years old and have already had contact with the disease (*Fig. 3*).

Figure 3. **Peer reaction to the disease**



Most often, the problems of a sick child are solved by his or her parents, particularly mothers (65%), then by grandparents (22%) who take care of the child when parents work or are absent. Only in 13% of children with bronchial asthma, older sisters or brothers looked after the children and helped them at the time of exacerbation of the disease (*Fig. 4*).

The question "Do you have the necessary knowledge to prevent the attacks of asthma?" was in 80% answered positively. The parents think they have enough knowledge to give professional help to their child if necessary i.e. at the time of dyspnea paroxysm.

The analysis of questionnaires has shown that the greatest source of knowledge about their child's disease is medical staff (40%). Many respondents (20%) think that they get most information from their own observation and the experience of care

Figure 4. **Solving problems of a sick child**

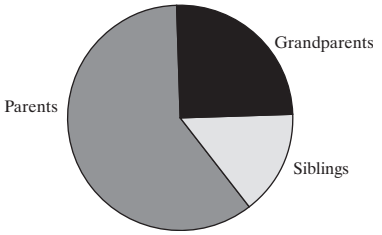
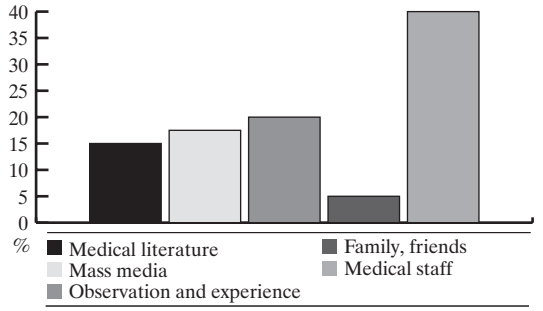


Figure 5. **Sources of knowledge on bronchial asthma**



of an asthmatic child. Friends and family seem to be the least reliable source of knowledge about the effects and prevention of the dyspnea attacks. Medical literature and the media provide only the basic knowledge about the disease but do not say how to cope with difficult situations (*Fig. 5*).

Discussion

Asthma belongs to the diseases that may pose serious threat to health and life if it is misdiagnosed, diagnosed too late or improperly treated. Nowadays, bronchial asthma is considered to be a serious health, social and economic problem. It concerns a marked group of the society and its morbidity rate is high, especially in children up to 5 years of age [4-6]. This ailment seriously disturbs their physical and psychic development. It also markedly lowers the quality of their lives. Specific and difficult conditions imposed on children with bronchial asthma are the source of strong and negative emotions. The knowledge of risk factors, proper education of parents and children, and the ability of taking fast actions in order to achieve total or partial elimination of risk – the dyspnea attack – lets the child function in a peer group in a normal way [7-9]. Asthma in children is connected with increased susceptibility to diseases, thus, it was interesting for us to find how it influenced the child, his relatives and peers [3,8]. The other purpose of the study was to find out if this ailment decreased the child's activity or prevented him from participation in activities he wanted to take part in.

In the 70ies of the last century, the studies on the influence of the asthma child behavior on the course of the disease were started. Then, the first educational programs for patients and their families were created. The first centers offering systematic classes for patients teaching how to learn proper reactions and behaviors in order to control the course of asthma were also created at that time. Nowadays, national educational programs connected with the control of allergy and asthma in children and adults are being created and implemented [4,5,7]. Thanks to them, the patients and their families find the answers to many nurturing them questions. They learn about where the allergens may appear and how to avoid them, how to lessen the tension and stress connected with the disease, how to control the disease and how to prevent or decrease the symptoms of dyspnea. The parents constitute a special educational group as they are the ones who are responsible for their children and their education. They also learn what to do at the moments when their child's life is at risk. It has been observed that parents who are themselves asthma victims are more persistent in caring of the child. Most parents have got strong motivation and are open to any information or idea on asthma. It is mothers, particularly, who strongly react to any breathing disturbance in their child. After some time, the children feel that every breathing disturbance brings about mother's care and worry. In consequence, all people related to the sick child, emotionally or formally are involved. Thus, the system includes the family, work environment, friends, teachers, other asthma victims, medical staff, psychotherapists and social workers.

Conclusions

The study has shown that hay fever and atopic dermatitis accompanying bronchial asthma markedly make their functioning among peers difficult. Bronchial asthma makes most children suffering from it resign from favorite games and plays connected with physical effort. The attitude of peers to these children can be described as indifferent. In the opinion of the majority of parents and other older children – friends of asthma sufferers, their knowledge about bronchial asthma is sufficient.

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The evaluation of secondary school students′ knowledge about risk factors of cardiovascular disease

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Abstract

The aim of the study was to evaluate the knowledge of teen-agers about risk factors of cardiovascular diseases (CVD) and the establishment of the field in his problem, which needs attention in realization of education programs addressed to secondary school students.

This paper presents outcomes of questionnaire study concerning knowledge of the factors promoting cardiovascular diseases occurrence, which took place in 2003 among secondary school 2nd class students. The questionnaire was filled by 167 people, 83 of them were girls and 84 boys.

Study revealed quite good knowledge of such risk factors of cardiovascular diseases, as: alcohol misuse – 86.2% of correct answers, smoking – 85.6% of correct answers. Obesity, family history of CVD, hypertension and sclerosis were pointed as a risk factor of cardiovascular diseases by 79.6%, 75.4%, 73.1%, 68.3% of students, respectively, and sedentary life with low physical activity 74.3%. The analysis of outcomes revealed unsatisfied knowledge of factors connected with the manner of nutrition. Consumption of cream butter was pointed only by 9.0% of students, and frequent eggs consumption – 21.0%, salted meals – 47.3%, irregular eating – 52.7%. Fat meat and animal fat consumption was best recognized risk among nutritional factors – 72.5% of correct answers.

None of students couldn't show all correct answers according to 14 included in questionnaire. Every fourth student didn't know even half of enumerated risk factors of cardiovascular diseases.

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Key words: risk factors, cardiovascular diseases, the teen-agers.

Introduction

Health behavior is created during childhood and adolescence, influenced by information and patterns delivered by parents, school and mass media [1-3]. The most efficient way of limitation of the epidemic of cardiovascular diseases (CVD) is limitation of risk factors during primary prevention, particularly including the population in young age [3-5]. The knowledge about risk factors of a disease in population should allow designing proper health promotion strategy [4].

The aim of the study was to evaluate the knowledge of II class of secondary school students about CVD risk factors and setting the field concerned with the prevention of cardiovascular diseases, which needs the great caution in programs addressed to the secondary school youth.

Material and method

The study encompasses students of II class of secondary school in Brzeziny (district city in Łódź province), who were present at school from 15 to 19 of September 2003. Based on the date of birth we chose 183 people ending 14th year of life in the year of study. The questionnaire was filled by 167 students, among them 83 were girls (49.7%) and 84 were boys (50.3%). Absent students were excluded from the study, that is 16 people (8.7%), among them 6 boys and 10 girls.

Information that we analyzed we received by using a questionnaire enumerating 14 different features or types of behavior influencing CVD occurrence. Young people ought to point, which of these promote cardiovascular diseases.

We calculated the percent of identified by youth risk factors and we analyzed the knowledge of cardiovascular diseases risk factors, dividing them into three groups:

Table 1. **Number and percent of students recognized cardiovascular diseases risk factors**

Risk factors	Students recognized factor	
	n	%
Alcohol misuse	144	86.2
Smoking	143	85.6
Stressing work	142	85.0
Obesity	124	79.6
Family history of CVD	133	75.4
Sedentary life with low physical activity	126	74.3
Hypertension	122	73.1
Fat meat and fat consumption	121	72.5
Sclerosis	114	68.3
Irregular eating	88	52.7
Slated meal	79	47.3
Male	70	41.9
Frequent eggs consumption	35	21.0
Consumption of cream butter	15	9.0

a) factors connected with lifestyle such a alcohol misuse, cigarette smoking, sedentary lifestyle with low physical activity, stressing work;
b) factors connected with manner of nutrition, in witch we mark out cream butter consumption, frequent eggs consumption, additional salting of meals, irregular eating, fat meat and animal fats consumption;
c) remaining factors such a obesity, sclerosis, family history connected with heart diseases, male sex and high blood pressure.

Results

The highest percent of students – 86.2% people admit, that alcohol misuse is the enhancing risk factor of the cardiovascular diseases, among them girls pointed this factor more often than boys, 94.0% and 78.6% respectively – *Tab. 1*. Cigarette smoking as a risk factor of CVD was pointed by 85.6% of students, including 92.8% of girls and 78.6% of boys. Stressing work with cardiovascular diseases was identified by 85.0% of all students. Obesity was believed to be a CVD risk factor by 79.6% of examined students, family history connected with heart diseases – 75.4%, sedentary lifestyle with low physical activity – 74.3%, high blood pressure – 73.1%, and sclerosis – 68.3% of students. Most of students – 58.1% didn't know, that male sex is a risk factor of cardiovascular diseases. Fat meat and animal fats consumption was believed to be a risk factor of CVD by 72.5% of students, and irregular eating by 52.7%. Factors as additional salting of meals and frequent eggs consumption were pointed by 47.3% and 21.0% of students, respectively, as favoring the occurrence of CVD. Only 9.0% of secondary school students considered that cream butter consumption could enhance the risk of cardiovascular diseases.

The evaluation of secondary school students' knowledge according to the number of identified types of behavior enhancing the risk of CVD occurrence was done by setting together risk factors in groups. All four CVD risk factors connected with lifestyle were pointed by 59.3% of students (66.3% of girls and 52.4% of boys) – *Fig. 1*. Less then every fourth person, that is 24.1% of girls and 21.4% of boys, knew three of four enumerated types of behavior. Two of four behavioral risk factors were pointed by 16.7% of schoolboys and 6.0% of schoolgirls. About 3% of people recognized only one feature connected with improper lifestyle (2.4% of girls and 3.6% of boys). However, 1.2% of girls and 6.0% of boys didn't know any of risk factors of CVD.

Figure 1. **The distribution of the amount of CDV risk factors connected with lifestyle, known by girls and boys**

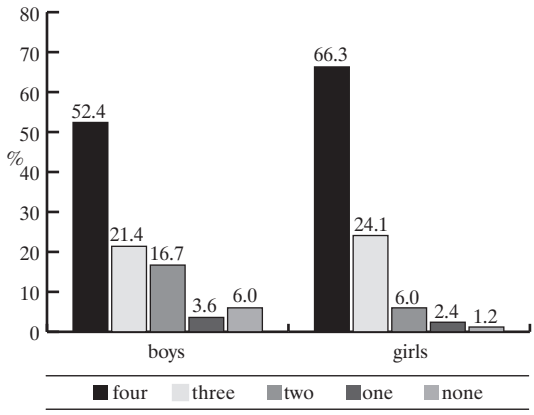
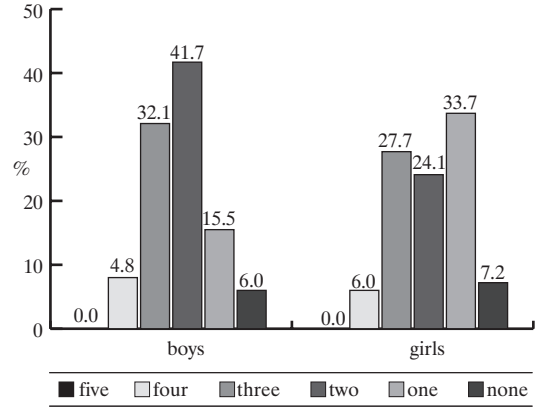


Figure 2. **The distribution of the amount of CDV risk factors connected with nutrition, known by girls and boys**



The study revealed that secondary school youth don't know the risk connected with nutrition. No one, among boys and girls, pointed all five enumerated in questionnaire features of improper nutrition – *Fig. 2*. Girls more often pointed one, and boys two factors in this group. Eleven people (6.6%) couldn't show any one risk factor of CVD connected with nutrition.

Tab. 2 presents the number of recognized by youth cardiovascular diseases risk factors, according to the sex of respondents. None child pointed all enumerated in the questionnaire factors enhancing occurrence of CVD. Ten or more among 14 factors were recognized by 40.7% of students. Half of factors (that is 7) or less knew 24.6% of students. In an examined group there was no person, who knows only one factor.

Table 2. **Number of recognized cardiovascular diseases risk factors, according to sex of respondent**

Number of recognized risk factors	Girls		Boys		Together	
	n	%	n	%	n	%
0	0	0.0	0	0.0	0	0.0
1	1	1.2	1	1.2	2	1.2
2	0	0.0	1	1.2	1	0.6
3	0	0.0	5	6.0	5	3.0
4	3	3.6	0	0.0	3	1.8
5	3	3.6	3	3.6	6	3.6
6	4	4.8	3	3.6	7	4.2
7	8	9.6	9	10.7	17	10.2
8	17	20.4	9	10.7	26	15.6
9	17	20.4	15	15.9	32	19.2
10	9	10.8	20	23.8	29	17.4
11	10	12.0	13	15.5	23	13.8
12	9	10.8	4	4.8	13	7.8
13	2	2.4	1	1.2	3	1.8
14	0	0.0	0	0.0	0	0.0
Total	83	100.0	84	100.0	167	100.0

Discussion

In the 90's there have been edited descriptions, which evaluated the knowledge of CVD risk factors. Such studies were performed, inter alia, among students of selected academies in Warsaw [9], future graduates of medicine departments in Bydgoszcz and Szczecin [10] and also among primary school students in the district Łódź-Górna [11]. In one of those studies, the one in which students of 3rd year of academies in Warsaw participated we fund, that 62.4% of students considered that lifestyle is a factor enhancing CVD [9]. The study performed with secondary school students revealed, that 14-year-olds knowledge in this theme was little less because 59.4% of all students pointed all four enumerated in a questionnaire behavioral factor enhancing the risk of cardiovascular diseases occurrence. It is worth noticing, those secondary school students better than academy students [9] knew inalterable risk factors, especially sclerosis – 68.3% and positive family history – 75.4%, which were pointed by 36.9% and 65.2% of academy students, respectively.

Participating in the study youth emphasized cigarette smoking (85.6%) as a CVD risk factor as often as academy students from Warsaw (85.0%) and future graduates of medicine departments in Bydgoszcz and Szczecin (82.5%), which knowledge in this theme was evaluated in the years 1996-1998 [9,10].

Examined secondary school students, aged 14, showed greater knowledge about CVD risk factors than students of the last years of primary school (aged 13-14) from the district Łódź-Górna [11]. In quoted paper stated, that knowledge of behavioral CVD risk factors has had 48.4% of boys and 44.0% of girls, but in our study 52.4% of boys and 66.3% of girls recognized all four CVD risk factors connected with lifestyle. Youth form Łódź, just like examined secondary school students, the most rarely among all factors pointed cream butter consumption as a risk factor enhancing the risk of CVD occurrence, and however the knowledge of this factor in both groups was differing. The knowledge in this theme had 29.7% of students from Łódź and 9.0% of students from Brzeziny, respectively.

Conclusions

1. The performed study revealed unsatisfied knowledge of cardiovascular diseases risk factors among secondary school students. None of students could point all fourteen enumerated factors. Only 40.7% of students knew ten or more of them.
2. Examined youth showed quite good knowledge of health threats, arising form improper lifestyle, however we noticed, that unsatisfied knowledge about risk factors connected with nutrition.
3. There is a need of including risk factors enhancing cardiovascular diseases issues, particularly in the field of nutrition, in health educational process of students in Poland.

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Burnout, stress and styles of coping among hospital nurses

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Abstract

Purpose: The evaluation of professional burnout among hospital nurses and the analysis of correlations between burnout and a subjectively perceived stress and coping styles.

Material and methods: A study sample consisted of 227 nurses from general medical, neurological and psychiatric hospital wards. A set of 3 questionnaires was used, including Maslach Burnout Inventory (MBI), Coping Inventory for Stressful Situations (CISS) and Subjectively Perceived Stresss (SPS).

Results: Average and high level of burnout in the emotional exhaustion (EE), depersonalisation (D) and personal accomplishment (PA) was present at 71%, 39.8% and 77% of nurses respectively. A significantly higher level of burnout was noted in the subgroup of general medical nurses. The diferences involved the total MBI score and the results of the subscales EE and D ($p<0.01$). A significant correlation has been found between the subjectively perceived stress and the level of burnout ($r=0.51$, $p<0.01$). Significant correlations has been found between MBI scores and CISS scores. Correlation between burnout and a task oriented coping was negative and correlation between burnout and emotion oriented coping was positive.

Conclusions: The level of stress influences the professional burnout among nurses. There is a diversity in the level of burnout depending on the specialization at work, which is not accompanied by a similar diversity in the subjectively perceived stress. The correlation between burnout and a coping style is rather weak, but statistically significant.

Key words: burnout syndrom, stress, nursing profession.

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Introduction

According to the researchers involved in the work on professional burnout, the syndrom appears mainly among the representatives of the professions whose essence is emotional involvement, close contact, interaction with other people and exposure to stress [1-3]. Undoubtedly, to such professions belongs the nursing profession [4,5]. Sęk et al. [6] developed a multifactorial model of stress and professional burnout, according to which the processes of burnout is determined both by situational and individual, subjective factors. Among the individual factors, the authors distinguished the type of control understood as obtaining, avoiding, savouring and coping, and professional convictions. This model did not include individual, dispositional coping styles which seem to be an important factor determining the intensification of the burnout symptoms. The aim of our research was the evaluation of burnout among hospital nurses and the analysis of correlations between burnout, the subjectively perceived level of stress and coping styles.

Material and methods

Initially in the research participated 250 nurses employed in the chosen general medical, neurological and psychiatric hospital wards in Poznań and outside Poznań. Finally, the study included 227 nurses, as some of them did not consent to participate, or did not fully complete the questionnaire. The research was conducted in two stages. The first stage took place in 2002 and included 101 general medical nurses. It consisted of investigating the professional burnout and the level of the subjectively

Table 1. **Characteristics of the study groups**

Subgroups	n (%)	Age (yrs) mean (SD) (min-max)	Total job seniority mean (SD) (min-max)	Job seniority in the ward mean (SD) (min-max)
Psychiatric	54 (23.79)	39.07 (8.5) (21-57)	17.57 (9.0) (0.5-37)	12.95 (9.3) (0.5-34)
Neurological	72 (31.72)	36.36 (6.9) (25-50)	14.60 (7.4) (2-30)	10.30 (7.1) (1-29)
General medical	101 (44.49)	33.59 (7.7) (20-52)	11.65 (7.0) (1-30)	7.51 (7.0) (0.2-30)
Total	227 (100)	35.59 (7.7) (20-57)	14.0 (8.0) (0.5-37)	9.72 (7.9) (0.2-34)

Table 2. **Mean and standard deviations for the Maslach Burnout Inventory (MBI) and Subjectively Perceived Stress (SPS)**

Subgroups	EE	D	PA*	Total MBI	SPS
Psychiatric	19.33 (10.7)[a]	4.30 (4.0)[a]	16.59 (7.8)	40.42 (15.8)[a]	43.85(21.1)
Neurological	21.11 (9.1)[a]	6.24 (6.2)[a]	17.63 (8.1)	44.49 (17.9)[a]	40.76 (22.6)
General medical	28.81 (12.1)[b]	8.87 (7.1)[b]	15.10 (8.6)	52.96 (24.1)[b]	48.59 (21.6)
Total group	24.11 (11.7)	7.0 (6.5)	16.24 (8.3)	47.25 (21.1)	44.9 (22.0)

* – reversed scores. Row scores in the subgroups and in the total group respectively: 31.6, 30.4, 32.8, 31.7
[a,b] – significant difference according to a post hock test
Kruskal-Wallis test for total MBI: H=8.71, p=.0129
Kruskal-Wallis test for EE: H=25.38, p=.0000
Kruskal-Wallis test for D: H=15.9, p=.0004
Kruskal-Wallis test for PA: H=3.81, p=.1481
Kruskal-Wallis test for SPS: H=4.83, p=.08
EE – Emotional Exhaustion, D – Depersonalisation, PA – Personal Accomplishment
SPS – Subjectively Perceived Stress

perceived stress. The second stage was performed from 2003 to 2004. It included 126 psychiatric and neurological nurses. To the previously applied measurment tools the questionnaire of stress coping styles was added. The detailed characteristics of the investigated group are presented in *Tab. 1*.

Burnout was tested with the Polish version of Maslach Burnout Inventory (MBI) [7,8]. The MBI is designed to assess the three components of the burnout syndrome: emotional exhaustion (EE), depersonalisation (D), and reduced personal accomplishment (PA). Distribution of scores in EE subscale ranges from 0-54, in D subscale from 0-30, and in PA subscale from 0-48. Total MBI ranges from 0-132 points. For the EE and D subscales, higher mean scores correspond to higher degrees of burnout. For PA subscale lower mean scores correspond to higher degrees of experienced burnout. In this study we inversed the scores of PA subscale in order to compare scores in all three subscales and in order to count the total MBI score. The coping style for stressful situations was measured with the Polish version of The Coping Inventory for Stressful Situations [9,10]. This inventory measures three main coping strategies: task focused, emotion focused, and avoidance coping. Avoidance coping can be divided further into two types: Distraction subscale and Social Diversion subscale. The score range is 16 to 80 points for the strategies and 5 to 40 and 5-25 for the two subscales. Subjectively perceived stress (SPS) was assessed with 100 millimetre unidimensional analogue scale.

Statistical analysis

Data were analysed using Statistica 2004 version. Descriptive statistics were presented as percents and arithmetic means with standard deviations. Since the distribution of the data was skewed, the hypothesis were tested with the non-parametric methods [11]. The Kruskall-Wallis ANOVA was used to test differences between nurses' burnout level and subjectively perceived stress in general medical ward, neurological and psychiatric wards. The Spearman's rank correlation coefficient was used to analyse the association between styles of coping (CISS) and burnout (MBI). P values below 0.05 were considered significant.

Results

The descriptive statistics of MBI are presented in *Tab. 2*. Because of the various theoretical ranges of particular MBI dimensions, a direct comparison of the median values was not possible. Therefore the saturation of particular subscales and the whole scale were calculated. The value of saturation for the whole scale was 35%, for EE – 44%, for D – 23.3%, and for PA – 33.3%. Therefore, it seems that the highest level of burnout occurred in the dimension of emotional exhaustion, whereas the lowest in the depersonalisation.

Using the categories of the level of burnout established by Maslach [12], it was found that 71%, 39.8% and 77% respon-

Table 3. **Categories of the Maslach Burnout Inventory (MBI) scores according Maslach's categorisation**

Subgroups	EE			D			PA		
	Low <16	Average 17-26	High >27	Low <6	Average 7-12	High >17	Low <16	Average 38-32	High <31
Psychiatric	22 (40.7%)	14 (25.9%)	18 (33.4%)	41 (75.9%)	10 (18.5%)	3 (5.6%)	8 (14.8)	22 (40.7%)	24 (44.4%)
Neurological	21 (29.2%)	35 (48.6%)	16 (22.2%)	48 (66.7%)	14 (19.4%)	10 (13.9%)	13 (18.1%)	19 (26.4%)	40 (55.6%)
General medical	23 (22.8%)	22 (21.9%)	56 (55.5%)	47 (47%)	26 (26%)	27 (27,5%)	30 (30.3%)	26 (26.3%)	43 (43.4%)
Total	66 (29.1%)	71 (31.3%)	90 (39.6%)	136 (59.9%)	50 (22.1%)	40 (17.7%)	51 (22.7%)	67 (29.8%)	107 (47.6%)

EE – Emotional Exhaustion, D – Depersonalisation, PA – Personal Accomplishment

Table 4. **Mean and standard deviations for the Coping Inventory for Stressful Situations (CISS) (N = 126)**

Subgroups	Task oriented	Emotion oriented	Avoidance oriented	Distraction subscale	Social diversion subscale
Psychiatric	55.35 (6.6)	42.17 (9.6)	44.1 (8.1)	18.22 (4.7)	16.43 (3.7)
Neurological	54.25 (8.1)	42.67 (8.1)	47.19 (7.4)	20.67 (4.7)	17.21 (3.3)
Total	54.71 (7.5)	42.45 (8.7)	45.87 (7.8)	19.62 (4.9)	16.87 (3.5)

dents experienced moderate to high levels of EE, D and PA (*Tab. 3*). A significanly higher (as compared to other groups) level of burnout was noted in the subgroup of medical nurses. The differences were found in the total MBI score and in the subscales of EE and D ($p<0.01$). In a similar way, the group of medical nurses was the one with the highest level of burnout in the aspect of EE (55.5%) and D (27.5%).

Among the examined nurses the most common was the task oriented coping style (*Tab. 4*). In order to test the hypothesis of the correlation between the burnout and subjectively perceived stress, we performed a correlation analysis between the MBI and SPS scores. We obtained the following Spearman's correlation coefficients: 0.52 (EE), 0.36 (D), 0.27 (reversed PA) and 0.51 for total MBI scores ($p<0.01$).

In order to test the hypothesis of correlation between burnout and coping styles, we conducted a correlation analysis between these variables. The obtained correlation coefficients varied from 0.001 (between EE and avoidance oriented coping) to 0.31 (between PA and task oriented coping). The correlation coefficients between the total MBI and the task oriented, emotion oriented and avoidance oriented coping were as following: 0.31, 0.17, 0.13. All significant coefficients between burnout and the task oriented coping and avoidance oriented coping were negative ($p<0.05$). A reversed situation was noted in relation to the emotions oriented coping, where significant correlation coefficients were positive ($p<0.05$).

Discussion

The present study showed that medium and high level of burnout in the emotional dimension, depersonalisation and personal involvement occurred respectively among 71%, 39.8% and 77% respondents. We compared our results with a big Canadian study conducted in 1999, in which 6500 nurses participated [13]. Mean scores for EE, D and PA were 22, 6.4 and 37.3 which means that the burnout level among Canadian nurses was similar to the burnout among Polish nurses. Only the scores for PA subscale were noticeably higher which suggests that the Canadian nurses felt more competent and successful than the nurses in our study. We also compared our results with the data from other Polish studies, conducted in the years 1993, 1994, in which 138 hopsital nurses participated [14]. The cited authors achieved the following mean MBI scores: for EE – 19.9, for D – 4.1 and for PA – 35.7. A noticeable difference can be found between all the MBI dimensions, which may suggest that the level of professional burnout among Polish nurses has increased in the last ten years. In our study we observed a significant diversity of burnout among nurses employed in various hospital wards. The diversity was present in two dimensions: emotional exhaustion and depersonalisation, but was not visible in the personal accomplishment. The most severe burnout was noted among the general medical nurses. Neurological and psychiatric nurses formed quite a homogeneous group with a significant lower level of burnout. It should be expected that the diversity of burnout corresponds to a similar diversity in the subjectively perceived stress. Howerver, such a regularity has not been found, despite the fact that the correlation between the perceived stress and the level of burnout was quite high. Beisert [15] believes that the level of burnout depends on the influence of two independent variables: the sense of psychological stress, or, in other words, subjectively perceived stress, and on the sense of one's remedial competences. So, maybe the second factor that we did not include in the study played a key role? Another question that stems from that is whether the nurses of narrower non-invasive specializations, such as psychiatry and neurology, posses a greater sense of professional effectiveness than the nurses with broader specializations, as general medical nurses? If it is so, why did this regularity occur only in two dimensions of burnout, and wasn't present in personal accomplishment? These problems should be focused on in the future research, in both the descriptive as well as explanatory aspect.

On the basis of the initial assumptions and earlier reserach, we expected the persons with task oriented style of coping to achieve lower MBI scores. And, in fact, we did observe such a tendency, but the achieved correlation scores were rather low.

That means that the task oriented coping, although perceived as the most efficient in neutralization of the effects of stress, to some extent protects against burnout. According to the assumptions, the research confirmed the regularity that concentration on personal emotional experiences in the face of stressful situations may lead to intensified burnout, but only in relation to one dimension, and not to a great extent. As far as the avoidance oriented coping is concerned, this style seems to be the one least connected with the process of burnout. In general, the obtained correlations between coping styles and the level of burnout indicate that some relation between these factors exist, however, this relations seem to be fragmentary and weak.

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Dietary habits of men from Podlasie region of Poland in the years 1987-1998 analysed with self-organizing neural networks

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Abstract

The study was conducted on a group of 556 men. Their dietary habits were evaluated 3 times in the years 1987-1998 by the frequency of consumption of 41 food items during last three months. Obtained frequencies were processed by self-organizing Kohonen neural network, allowing to group persons of similar dietary habits into 3 clusters. After analysing frequencies of consumption of each food item in each cluster, in view of health value, one model was described as appropriate, while remaining were described as two different inappropriate models. In three studies during 11 years, statistically significant increase in frequency of appropriate model was observed. That increase was linked with decrease of occurrence of inappropriate models. Additional verification of described models revealed significant differences between them in nutritive ingredients intake, and also in concentrations of HDL cholesterol in the blood serum of men assigned to those dietary patterns.

Key words: prospective studies, neural networks (computer), diet, atherogenic.

Introduction

Analysis of dietery habits, based on frequencies of various food consumption, includes large number of variables, which have to be evaluated simultaneously. These variables, are tied with complicated relationships [1-5]. These essentials are reasons for complexity of the problem and main source of difficulties in drawing conclusions upon nutrition as a whole and its impact on health condition.

The goal of study is the applying of self-organizing Kohonen neural networks to separate prevalent dietary patterns in studied population. The use of neural network would allow the concentration of diffused information about dietary habits into one variable representing dietary pattern. Such approach enables further investigation of relationships between dietary habits and health condition, especially concentrations of plasma lipids.

Material and methods

Studies were conducted from 1987 to 1998 in group of men settled down in north-eastern region of Poland. Each of 556 men participating in the studies was surveyed three times. The first screening was performed in the years 1987-1989, the second one in 1991-1993 and the third in 1996-1998.

The nutrition of studied persons was examined by means of two methods. To determine dietary habits during past 3 months, food frequency questionnaire was used. Its questions concerned 41 food items. Usual frequency of consumption was recalculated to mean monthly frequency of consumption.

Quantitative estimation of dietary habits involved 24-hour consumption questionnaire. In every case it was polled during definite time of year, namely from 25th of January to 31st of March, to exclude seasonal fluctuations of diet composition. From the information on the consumed products and dishes, including their amounts, the energy value and nutritive value, as well as content of the food groups, were calculated.

All men present in the study had their levels of serum lipids measured. Due to objective reasons, it was difficult to ensure employing the same methods during 9 years of the study. Some of the methods have passed out of use and moreover, manufacturers have desisted the production of obsolescent reagents. In case of necessity of method switching, estimated parameter was measured in a number of samples using both new and previ-

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ous methods. The new method was then adjusted so its output would match the results, obtained using the previous method. The concentrations of triglycerides in blood serum during first stage of the study were estimated using reagents produced by Technicon Instruments Corporation Tarrytown. During second and third stage kits from Ciba-Corning Diagnostics Corp. were used. The concentrations of total cholesterol were determined by Libermann-Burchard method during first and second periods of the study, while Ciba-Corning Diagnostics reagents in enzymatic reaction were used during the third one. The levels of HDL cholesterol in the first and second study were estimated using precipitation method by Lopes-Virelle. In the third study enzymatic method with utilization of Ciba-Corning Diagnostics Corp. Reagents was used. To estimate the concentrations of LDL cholesterol in blood serum Friedewald formula was used:

$$LDL\,cholesterol = total\,cholesterol - HDL\,cholesterol - 0.2 \times Triglycerides$$

The frequencies of consumption of various food items in 3-month period preceding the polling were analysed using Kohonen neural network. Obtained models were validated by comparson in view of quantitative consumption of nutritive ingredients and food groups received from 24-hour consumption questionnaire.

To determine the impact of dietary habits on blood serum lipids, the variable describing dietary pattern, which was generated by Kohonen network was used.

Because of lack of normality in distributions of most variables was observed, statistical reasoning involved nonparametric tests. The dependence of quantitative variables from nutrition model was tested with Kruskal-Wallis procedure and *post hoc* comparisons were executed according to Dunn's procedure [6]. The connection of categorical variables were tested with Pearson's chi-square and chi-square for trend [7] tests estimated. All hypotheses in statistical test were verified under desired type I error (alfa) set on 0.05. Statistical analyses of the data were performed with "Statistica" version 6.0 software from StatSoft.

Results

The use of Kohonen neural network allowed to isolate three dietary patterns, grouping persons of similar dietary habits (*Tab. 1*). The main factors differentiating these models were frequencies of consumption of food items containing fats. The 1st dietary pattern is characterized by high frequency of consumption of fresh margarine, fried vegetable oil and low frequency of consumption of fresh butter, fried lard and bacon. In addition, the 1st dietary pattern presented the most frequent consumption of poultry, fresh fish and fruits. The 2nd dietary pattern demonstrated adverse attributes than the 1st one. Very high frequency of consumption of fresh butter and fried lard was distinctive for that pattern. Furthermore, it indicated higher frequencies of consumption of giblets, smoked second-rate meats, bacon, eggs, sweet baking, sugar, jam, sweets, cookies and sweet beverages. The 3rd dietary pattern was characterised by low frequency of consumption of both butter and margarine, as well as the lowest frequency of consumption of milk and cheese.

Table 1. **Mean monthly frequencies of consumption of 41 food items in three separated dietary patterns**

Food items	Dietary pattern		
	1st	2nd	3rd
White bread	26.7	28.3	27.5
Dark bread	5.9	5.0	4.4
Sweet baking	6.7	8.5	4.8
Flour dishes	7.7	8.0	6.3
Cereal and rice	6.5	6.3	5.5
Milk	18.9	18.5	14.3
Cottage cheese	6.8	8.4	4.9
Cheese	7.6	7.3	4.7
Meat	20.3	22.3	21.8
Poultry	5.0	4.1	4.2
Giblets	2.8	3.2	3.2
Sausages	19.1	19.7	18.5
Smoked luxury meats	6.1	6.0	4.8
Smoked second-rate meats	4.8	5.2	5.1
Bacon	3.8	6.0	5.0
Canned meat	1.6	2.0	1.8
Canned fish	3.1	3.1	2.8
Fresh fish	4.2	2.6	2.9
Eggs	5.3	6.8	5.3
Fresh butter	2.2	26.4	6.3
Fried butter	1.0	2.0	1.3
Fresh margarine	26.9	1.3	3.0
Fried margarine	6.5	7.2	5.5
Fresh lard	1.2	1.9	2.5
Fried lard	5.9	14.3	10.6
Fresh oil	8.7	9.7	8.4
Fried oil	9.8	6.1	6.7
Potatoes	22.5	24.7	23.4
Boiled vegetables	8.6	9.3	8.5
Raw vegetables	13.0	15.5	13.2
Leguminous plants	3.6	4.2	4.1
Fruit	18.2	14.0	12.3
Sugar	24.7	27.9	22.8
Jam	5.1	6.7	3.8
Honey	3.0	2.8	2.1
Sweets	6.8	8.3	4.9
Cookies	6.7	7.7	4.6
Sweet beverages	18.8	20.1	17.2
Beer	4.7	3.9	4.6
Wine	0.6	0.8	0.6
Vodka	2.5	3.1	3.2

Described above patterns were created based on frequencies of consumption of various food items during past 3 months. It was purposeful to extend the characteristics of these models by information gained from 24-hour questionnaire, that is quantitative composition of the diet. *Tab. 2* and *Tab. 3* present energy value, nutritive ingredients and groups of products of three discussed patterns. Performed analyses reveal that, energy value, nutritive ingredients values and consumption of most groups of products differed significantly between patterns. There were no significant distinction only for consumption of alcohol, fruits and vegetables containing vitamin C and leguminous plants. The

Table 2. **Influence of dietary pattern on medians of energy value and nutritive values. Only significant p values are stated**

Variable	Dietary pattern			p value*	Pairs of patterns differing significantly**
	1st	2nd	3rd		
Energy [kcal]	2595.6	2946.1	2434.6	0.0001	1-2.2-3
Animal protein [g]	48.2	53.4	47.2	0.0001	1-2.2-3
Vegetable protein [g]	30.3	31.7	28.7	0.0001	1-3.2-3
Animal fat [g]	70.9	99.8	79.2	0.0001	1-2.1-3.2-3
Vegetable fat [g]	25.2	14.7	12.9	0.0001	1-2.1-3
Saccharosis [g]	52.6	71.1	55.2	0.0001	1-2.2-3
Carbohydrates without saccharosis [g]	263.3	274.7	243.7	0.0001	1-2.1-3.2-3
Calcium [mg]	516.7	511.7	385.9	0.0001	1-3.2-3
Ferrum [mg]	13.8	14.9	13.6	0.001	1-2.2-3
Vitamin A [μg]	627.9	690.6	557.4	0.0001	1-2.1-3.2-3
Vitamin B_1 [mg]	1271.0	1449.1	1281.0	0.0001	1-2.2-3
Vitamin B_2 [mg]	1326.4	1476.1	1254.8	0.0001	1-2.2-3
Vitamin C [mg]	45.2	49.6	46.2	0.025	1-2.
Alcohol [g]	0.043	0.029	0.071		

* Kruskal-Wallis test
** Dunn's test

Table 3. **Content of groups of foods in three separated dietary patterns. Only significant p values are stated**

Groups of foods	Dietary pattern			p value*	Pairs of patterns differing significantly**
	1st	2nd	3rd		
Corny products [g]	258.1	266.0	227.4	0.0001	1-3.2-3
Milk and dairy products [g]	250.0	285.5	22.2	0.001	1-3.2-3
Eggs [g]	5.2	7.3	5.6	0.003	1-2
Meat and fish [g]	279.9	307.7	290.2	0.002	1-2
Butter [g]	5.0	22.5	6.0	0.0001	1-2.1-3.2-3
Other fats [g]	44.2	32.6	31.5	0.0001	1-2.1-3
Potatoes [g]	462.0	462.0	462.0		
Vegetables and fruits containing vitamin C [g]	50.0	44.8	47.4		
Vegetables and fruits containing carotene [g]	57.2	60.5	50.0	0.006	2-3
Other vegetable and fruits [g]	237.2	279.4	229.8	0.001	1-2.2-3
Leguminous vegetables [g]	0	0	0		
Sweets [g]	56.6	77.6	60.0	0.0001	1-2.2-3

* Kruskal-Wallis test
** Dunn's test

Table 4. **Influence of dietary pattern on medians of blood lipids profile in each period of study. Only significant p values are stated**

Period of study	Variable	Dietary pattern			p value*	Pairs of patterns differing significantly**
		1st	2nd	3rd		
1st	Total cholesterol [mg/dl]	206	214	217		
	LDL cholesterol [mg/dl]	136.4	135.85	139.4		
	HDL cholesterol [mg/dl]	48	47.15	47.8		
	Triglycerides [mg/dl]	124	124	126		
2nd	Total cholesterol [mg/dl]	209.5	215	218		
	LDL cholesterol [mg/dl]	135.15	142.8	142		
	HDL cholesterol [mg/dl]	47	44	45.4	0.001	1-2.2-3
	Triglycerides [mg/dl]	122	122	123		
3rd	Total cholesterol [mg/dl]	212	202.5	214		
	LDL cholesterol [mg/dl]	132.6	128.8	132.2		
	HDL cholesterol [mg/dl]	49	51	49		
	Triglycerides [mg/dl]	121	104.5	129		

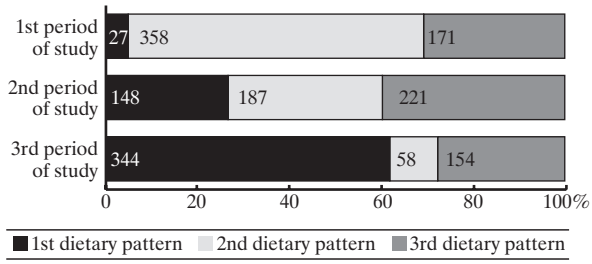
* Kruskal-Wallis test
** Dunn's test

1st dietary pattern was characterised, compared to 2nd dietary pattern, by lower energy intake, lower content of animal fat and saccharosis, whereas higher content of vegetable fat. In addition 1st pattern's diet contained lower quantities of eggs, meat, butter and sweets, and higher quantity of "other fats" (this group includes all fats except for butter, amongst other vegetable oil and margarine) than 2nd dietary pattern. Diet in 3rd pattern was characterised by lowest intake of calcium and content of milk compared to remaining patterns.

After all men have been classified to one of 3 dietary patterns, concentrations of triglycerides, cholesterol and its fractions in blood serum were compared between patterns. Because of changes of methods used to measure these parameters in the course of studies, the comparisons were conducted separately for each of three periods of the study – *Tab. 4*. In the second study, persons qualified by Kohonen network to 1st dietary pattern had significantly higher HDL cholesterol level than persons in 2nd pattern. There were no significant differences in concentrations of triglycerides and total and LDL cholesterol between patterns observed. The most likely reason, that levels of none of measured blood serum lipids differed significantly in the first and the third study, are considerable disproportions in occurrences of 1st and 2nd dietary pattern.

Fig. 1 presents counts of men classified to one of three dietary patterns in each of three periods of study. The frequencies of occurrence of the 1st dietary pattern in subsequent periods of study showed significant rising trend ($p<0.001$), while the 2nd pattern presented significant falling trend ($p<0.001$). The percentage of men qualified to the 1st dietary pattern rose from 4.9% to 61.9% and the percentage of men assigned to the 2nd dietary pattern fell from 64.4% to 10.4%.

Figure 1. **Occurrence of three separated dietary patterns in subsequent studies during 9-year observation**



Discussion

The objective of most neural networks is to find best fitted function transforming input vector data into output vector. Kohonen network in contrary to other types of neural networks, require to train only input data. In the process of learning, network by itself isolates repetitive patterns and learns to recognize them. For this reason, described method is well suited for partitioning large set of data into subsets consisted of similar entities [8,9]. In last 10 years time period, it was unable to find in Medline database resources any publication covering the topic of application of evaluating dietary habits using neural networks, especially Kohonen networks. Just few works applied this method in studies on food itself [10-16].

The application of Kohonen neural network allowed to partition studied group of men into 3 subsets, according to frequencies of consumption of various food items. The significance of that division was verified by estimating its influence on other variables, that were not used in process of learning the network, thus potentially independent of that division. Significant differences among patterns for these variables indicates, that assignment of persons to patterns is not random. The attributes of dietary patterns let describe 1st pattern as beneficial in view of atherosclerosis prevention, 2nd pattern as unfavourable in view of atherosclerosis and obesity prevention and the 3rd one as unfavourable in view of osteoporosis prevention.

The grouping obtained using self-organizing neural network allowed to reveal favourable changes in the dietary habits of studied men during 9 years. In subsequent periods of study, the 1st dietary pattern, described as advantageous in view of atherosclerosis prevention, were displacing the 2nd pattern, likely to stimulate atherosclerosis development.

The work demonstrated relations between dietary habits and quantitative composition of diet, as well as blood serum lipids profile. The blood level of HDL cholesterol of men from the 1st dietary pattern – beneficial in view of atherosclerosis was significantly higher, than in group, that indicated atherogenic features of nutrition – the 2nd dietary pattern.

The advantage of presented method is, that it simultaneously analyses all variables describing dietary habits by frequencies of consumption of various food items and defines homogenous subsets – dietary patterns. Separate analyses of frequencies of consumption of each food item are biased by probability of making an error while testing hypotheses (desired type I error – alfa, usually set for 0.05). While drawing final conclusions from many partial, biased conclusions, these errors accumulate and value of such general conclusions is decreased.

It seems, that application of multivariate analysis methods, such as Kohonen neural networks, in the field of nutritional science has relevant advantages and improves available possibilities of reasoning and generalization.

Conclusions

1. Prospective study of men from Podlasie region in Poland, conducted from 1987 to 1998 indicated significant, beneficial changes of their dietary habits, described by frequencies of consumption of various food items. The percentage of men qualified to 1st dietary pattern, that is characterized by high frequency of consumption of food rich in vegetable plants and low frequency of consumption of foods containing large quantities of animal fat, rose significantly from 4.9% to 61.9%. The percentage of men classified to 2nd dietary pattern, that is indicating high frequency of consumption of food rich in animal plants and low frequency of consumption of foods containing vegetable fat, fell significantly from 64.4% to 10.4%. These changes are advantageous in view of prevention of atherosclerosis, cardiovascular disease and obesity.

2. Dietary pattern determined by self-organizing neural network is variable, that encloses differences in dietary habits, estimated by frequencies of consumption of food items, in a synthetic way. Dietary habits are treated as a whole and not as a set of separate components. The use of such created variable – dietary pattern – allows to define relations between dietary habits and other attributes, characterizing health state.

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Objective and subjective quality of life in schizophrenic patients after a first hospitalization

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Abstract

Purpose: There is no single, universally accepted definition of quality of life (QOL). Both subjective and objective information is necessary to assess QOL. The aim of the study was to evaluate in cross-sectional and prospective manner objective and subjective quality of life in schizophrenic patients 1 month after hospitalization and in one year follow-up.

Material and methods: A study sample consisted of 86 schizophrenic subjects: 52 male and 34 female; age 25.5; ±5.8 (range 17-47) and control group of matched 52 male and 34 female subjects were enrolled. Subjective QOL scale (WHOQOL-BREF), Social Functioning Scale (SFS) and structured questionnaire were used. Patients were evaluated 1 month (T1) and 13 months (T2) after a discharge from the hospital.

Results: In both T1 and T2 we found similar levels of SFS score and subjective measurement of QOL in patients, which were significantly lower than in healthy controls.

Conclusions: This study showed that both objective and subjective quality of life are significantly decreased directly after hospitalization, and they are relatively stable in 1-year follow-up.

Key words: social functioning, quality of life, schizophrenia, first-episode, 1-year follow-up.

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Introduction

Quality of life (QOL) is a complex and multidimensional construct. There is no single, universally accepted definition of QOL. The World Health Organization definition focuses on the subjective perspective [1]. Definitions include several broad concepts such as well-being, happiness/satisfaction and achievement of personal goals. Quality of life instrument can measure both health-related quality of life (HRQOL) and generic QOL. HRQOL is one part of the total QOL. The concept has often been measured in patients with different symptoms of diseases and it is closely connected to health and includes both physical and mental status [2]. Both subjective and objective information is necessary to the construct [3]. Social functioning impairment is essential feature of schizophrenia and belongs to objective indicators of health.

The purpose of this study was to assess social functioning and subjective QOL in first-episode schizophrenia patients, 1 month after hospitalization (T1) and in 1-year follow-up (T2).

Material and methods

Ninety-six patients were qualified for the study after hospitalization due to the first episode of psychosis. At discharge, all study subjects met the diagnostic criteria for schizophrenia (ICD-10) [4]. During a first and a second assessment, respectively, 8 and 2 patients refused to participate, resulting in the final group of 86 subjects: 52 male and 34 female; age 25.5; ±5.8 (range 17-47). The control group comprised 86 psychiatrically healthy subjects: 52 male and 34 female matched according to age. Psychometric measures: Social Functioning Scale (SFS) is a 79-item questionnaire, developed and validated on outpatients with schizophrenia [5]. The questionnaire asks the patient about performance in seven areas: Social Engagement (SE), Interpersonal Communication (IC), Recreational Activity (RA), Social Activity (SA), Independence Competence (INC), Independence Performance (IP) and Occupational Activity

Table 1. **Comparison of social functioning in schizophrenia patients measured with Social Functioning Scale 1 month and 13 months after hospitalization, and the score of healthy control subjects**

	SFS T1	SFS T2	t	p	SFS in healthy controls	SFS in patients (T2) vs controls
	Mean (SD)	Mean (SD)				
SFS global	103.7 (11.88)	105.5 (10.68)	-1.79	0.08	117.0 (6.71)	-8.458***
Social engagement (SE)	105.2 (11.08)	107.1 (12.77)	-1.80	0.08	114.4 (10.14)	-4.149**
Interpersonal communication (IC)	110.3 (19.98)	113.4 (19.88)	-1.45	0.15	130.3 (15.55)	-6.181***
Social activity (SA)	102.3 (15.96)	104.3 (13.43)	-1.06	0.16	120.3 (11.02)	-8.501***
Recreational activity (RA)	99.3 (14.93)	100.4 (14.28)	-.58	0.56	111.4 (13.46)	-5.153**
Independence performance (IP)	93.8 (15.12)	95.7 (15.61)	-1.42	0.15	106.6 (11.70)	-5.131**
Independence competence (INC)	109.3 (14.60)	109.6 (14.92)	-0.80	0.42	117.0 (8.83)	-3.906**
Occupational activity (OA)	109.8 (14.08)	108.9 (13.27)	0.29	0.77	122.3 (1.67)	-9.155***

*** $p<0.001$; ** $p<0.01$

Table 2. **Comparison of subjective quality of life in schizophrenia patients measured with WHOQOL-BREF 1 month and 13 months after hospitalization, and the score of healthy control subjects**

WHOQOL - BREF	WHOQOL T1	WHOQOL T2	t	p	WHOQOL in healthy controls	patients T2 vs controls
	Mean (SD)	Mean (SD)				
Overall quality of life (Q1)	3.3 (0.88)	3.3 (0.91)	0.12	0.90	3.8 (0.84)	3.76 ***
Physical Domain (Ph)	14.6 (2.61)	14.8 (2.51)	-0.67	0.51	16.3 (2.40)	5.23 ***
Self-evaluation of the health status (Q2)	3.1 (0.99)	3.1 (0.99)	0.19	0.85	3.8 (0.86)	4.47 ***
Psychological Domain (Ps)	12.5 (2.69)	12.5 (3.13)	0.13	0.90	14.5 (2.74)	5.41 ***
Social relationships Domain (SR)	13.0 (2.75)	13.1 (3.16)	-0.49	0.62	15.7 (3.21)	6.44 ***
Environment (E)	13.6 (2.34)	14.0 (2.14)	-1.81	0.07	13.8 (2.69)	NS

*** $p<0.001$

(OA). The self-report questionnaire was administered by a verbal interview to the patients. SFS was previously translated into Polish and validated [6]. The WHOQOL-BREF [7] is an international quality of life instrument which produces a profile with four domains scores: Physical (Ph), Psychological (Ps), Social relationships (SR), Environment (E) and two separately scored items about the individual's perception of quality of life (Q1) and health (Q2). According to WHO quality of life is "individuals' perceptions of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns". The English version of the instrument had been previously translated and psychometrically validated in Poland. Psychometric properties of the WHOQOL-BREF are satisfactory in a large extend [8]. Demographic and clinical variables regarding preadmission and hospitalization periods were measured with a structured interview. The protocol of the study was accepted by Bioethical Committee of Poznan University of Medical Sciences. We used Student t-test for independent data to compare results of the patients and the controls. Student t-test for dependent data was used to compare the first and the second measurements of social functioning and subjective OQL in patients.

Results

Study sample consisted of predominantly male (60.5%) and young (62.8% below 22 years of age) patients. At a first admission mean age of patients was 25.5 years (SD 5.8). Female patients at the first admission were older (mean difference 2.8 years, $t=2.26$, $p<0.05$).

After the first hospitalization in 51.2% of patients we observed significant impairment of social functioning (SFS score ≤105). Mean SFS scores in T1 and T2 were 103.7 and 105.5 respectively and did not show significant change. Between first and second assessment, level of social functioning was not changed in majority of patients (59.2%). The difference between T2 results of patients and healthy controls was significant for global assessment ($p<0.001$) and every subscale of SFS. The most significant differences between patients and controls were observed in 3 subscales: IC, SA, OA ($p<0.001$) (*Tab. 1*).

In both assessments more than half of patients were not satisfied with their general quality of life (Q1) – T1: 52.3%, T2: 51.2%. In both assessment significantly lower score in assessment of Ps dimension than in 3 other aspects of subjective quality of life (Ph, E, SR) were observed ($chi^2=71.54$. $df=3$; $p<0.001$).

Subjective quality of life in one-year follow-up was not changed either in the global evaluation and in the domains. In significant number of patients (43%) we observed improvement in E dimension. WHOQOL mean scores were significantly worse in patients than in healthy control group ($p<0.001$), except the environmental domain (*Tab. 2*). Significantly lower number of patients than controls were satistfied with their general quality of life (Q1) – 48.8% vs 72.1% ($t=3.69$, $p<0.01$) and with health status (Q2) – 40.7% vs 68.6% ($t=4.24$, $p<0.01$). In study group mean values for WHOQOL-BREF items were in range 2.6--4.3 points, in comparison subjects in range: 1.5-4.5 points. In patients the lowest subjective rating of quality of life in patients reffered to joy of life, ability to concentrate, amount of money to satisfy needs, aim of life, feeling of safety and sexual life.

Discussion

These results suggest that in schizophrenic patients, quality of life in both functional and subjective dimension is poor one month after a hospitalization and does not change significantly during 1-year follow-up. The impairment of social functioning in early phase of schizophrenia was reported in many studies [9,10,11] and some reported also lack of differences in comparison with patients with longer duration of illness [12]. Similarily, low scores in subjective quality of life were reported in majority of studies in patients with first episode of schizophrenia or early phase of the illness [9,10].

Follow-up studies brought discrepant results concerning changes in subjective and objective quality of life in schizophrenia [10,13]. In several studies no significant change in quality of life was observed [13,14]. Several researchers reported worsening of one or both dimensions of quality of life [9,15], which was associated mainly with drop-out from intensive treatment programs. Conversely, significant improvement of quality of life was associated mainly with different therapeutic interventions [16,17]. These results suggest, that early intervention may improve only short-term outcome [15], and stability of improvement may be associated only with long-term programs aimed at prevention of recurrences.

We replicated findings of other authors, who reported that subjective dissatisfaction with quality of life in patients with schizophrenia is associated with poor social relationships, and difficulties with job, finances and health problems [9,18]. The lowest scores reported in PS dimension may be associated with concept of self, which is disturbed in early phase of schizophrenia [19].

Improvement in Environment (E) dimension of subjective QOL in patients may lead to level of satisfaction observed in healthy subjects. In previous studies, subjective quality of life was better in patients with longer duration of schizophrenia, than in patients with shorter course of illness [12,13], which is probably associated with dynamic adaptation (response shift and quality of life) [20]. In our study improvement in (E) dimension indicates positive impact of environmental factors.

The obtained results point to the role of early pharmacological and psychosocial intervention in schizophrenia. Such an action, may allow to avoid the personality disintegration and help to build social support network, which is essential in establishing appropriate level of functioning in schizophrenic patients.

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The prevalence and clinical significance of antiphospholipid antibodies in the patients with systemic sclerosis – preliminary report

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Abstract

Purpose: The aim of our study was to evaluate the prevalence of anticardiolipin and anti-β2-glikoprotein I (anti-β2GPI) antibodies in patients with systemic sclerosis (SSc) and to correlate the presence of these antibodies with clinical and serological features of the disease.

Material and methods: 22 patients (21 women and 1 man) fulfilling the ACR classification criteria of SSc were included into the study. In all SSc patients a detailed clinical evaluation including skin and internal organ involvement was performed. Moreover, the measurements of anti-topoisomerase I (anti-Scl-70) and anticentromere (ACA) antibodies were done in all patients studied. Anticardiolipin antibodies in IgM and IgG class and anti-β2GPI antibodies in IgM, IgG and IgA class were evaluated using ELISA kits (Hycor Biomedical and DiaSorin).

Results: Anticardiolipin antibodies were found in 10/22 (45.5%) patients with SSc, in 6/12 (50%) with diffuse SSc and in 4/10 (40%) with the limited SSc. Anticardiolipin antibodies in the IgG class were observed in 4/22 (18.2%) patients, and in the IgM class in 9/22 (40.9%) subjects. Anti-β2GPI antibodies were found in 9/22 patients (40.9%), of which 3/22 (13.6%) had antibodies in IgG class, 4/22 (18.2%) in IgM class and 3/22 (13.6%) in the IgA class. Anti-β2GPI antibodies were found exclusively in the patients in whom the anticardiolipin antibodies were also present. An association between the presence of antiphospholipid antibodies and internal organ involvement (pulmonary fibrosis, pulmonary hypertension and the alterations of oesophageal function) was not significant. No significant correlation was found between the presence of anticardiolipin or anti-β2GPI antibodies and the presence of anti-Scl-70 or ACA antibodies.

Conclusions: The results of our study indicate that the prevalence of anticardiolipin antibodies and anti-β2GPI antibodies is relatively high in patients with SSc. A more detailed assessment of the relationship between the presence of antiphospholipid antibodies and the clinical and serological features of SSc requires further studies on the larger group of patients and a several years of follow-up.

Key words: systemic sclerosis, antiphospholipid antibodies, anticardiolipin antibodies, anti-beta2-glycoprotein I antibodies.

Introduction

Antiphospholipid (aPL) antibodies have been investigated for many years. Their contribution to various clinical symptoms, mainly venous and arterial thrombosis, miscarriages and thrombocytopenia has been proved about 20 years ago. The occurrence of these clinical symptoms accompanied by the presence of anticardiolipin (aCL) antibodies and/or lupus anticoagulant (LAC) is called an antiphospholipid syndrome (APS). APS may be of the primary (there is no coincidence of another disease) or secondary origin (in the course of other diseases such as systemic connective tissue diseases, neoplasms, chronic infectious diseases).

Systemic sclerosis (SSc) belongs to the group of the connective tissue diseases. Vascular changes play the key role in the pathogenesis of SSc leading to the ischemia of different tissues and, as consequence, to a number of clinical complications [1-3]. Until recently the pathogenesis of these changes has remained unclear. There have been intensive studies on this subject, in the hope that, the knowledge of the origins of

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Table 1. **Clinical and laboratory characteristics of the patients with systemic sclerosis**

Patients with SSc (n= 22)	
Female	21
Male	1
Disease duration [years]	0.5-17 (mean 4.1)
Raynaud phenomenon no. (%)	21 (95.5)
Pulmonary fibrosis no. (%)	15 (68.1)
a) early changes (HRCT)	5 (22.7)
b) advanced fibrosis	10 (45.5)
Pulmonary hypertension no. (%)	8 (36.4)
Oesophageal dysmotility no. (%)	16 (72.7)
Renal involvement no. (%)	1 (4.5)
The presence of ACA no. (%)	9 (40.9)
The presence of anti-Scl-70 no. (%)	12 (54.5)

SSc=systemic sclerosis, HRCT=high resolution computed tomography, ACA=anticentromere antibodies, anti-Scl-70=anti-topoisomerase I antibodies

the disease may help to treat the patients with SSc more effectively [4].

APS is characterized by the presence of thrombotic changes in the venous and arterial vessels causing tissue ischemia. It has been shown that aCL affect the endothelial cells of the small vessels leading to the activation of the complement system with the following thrombosis. In view of the above theory special attention should be paid to the connection between the presence of aPL antibodies and SSc. The question if aPL antibodies may cause ischemic changes in the course of SSc [1,2], even when the criteria for the diagnosis of the secondary APS are not met, is of crucial importance. There have been only a few studies on the prevalence of the aPL antibodies in the patients with SSc. These studies have been based on the routine assessment of aCL antibodies in the IgG and IgM class while IgA class, which might have a great clinical significance, was not taken into account [5].

During the last few years new types of aPL antibodies, which do not fall into the range of a standard serological diagnostics, have been found. A lot of data indicate that the majority of the routine measurements allow to assess antibodies against the two serum phospholipid binding proteins: beta 2-glicoprotein I (β2GPI) and prothrombin [5,6,7]. Anti-β2GPI antibodies (anti-β2GPI) are mainly responsible for anticardiolipin activity in the serum of the patients with APS [8].

The aim of our study was to evaluate the prevalence of aCL antibodies and anti-β2GPI antibodies and to attempt to correlate the presence of these antibodies with the organ involvement in the patients with SSc.

Material and methods

The study included 22 patients (21 women and 1 man) with SSc (12 with diffuse SSc and 10 with its limited form) aged 23-71 years (mean 51.3 years). All patients met the criteria for the diagnosis of systemic sclerosis according to ARA (American College of Rheumatology, formerly American Rheumatism Association) [9]. In all studied patients a detailed clinical analysis has been performed with the assessment of skin score as well as joint and organ involvement. Moreover, the measurements of anti-topoisomerase I (anti-Scl-70) and anticentromere (ACA) antibodies using Pharmacia Diagnostics kits have been done. Anticardiolipin antibodies in IgM and IgG class and anti-β2GPI antibodies in IgM, IgG i IgA class were evaluated with ELISA kits (Hycor Biomedical and DiaSorin).

Clinical and laboratory data of the SSc patients are shown in *Tab 1*.

Statistical analysis

Statistical analysis was performed using the Mann-Whitney U test and the Fisher's exact test.

P values less than 0.05 were considered statistically significant.

Results

Anticardiolipin antibodies were found in 10 out of 22 (45.5%) patients with SSc, in 6 out of 12 (50%) with diffuse SSc and in 4 out of 10 (40%) with the limited SSc. Anticardiolipin antibodies in the IgG class were observed in 4 out of 22 (18.2%) patients, and in the IgM class in 9 out of 22 (40.9%) subjects. Anti-β2GPI antibodies were observed in 9 out of 22 patients (40.9%), of which 3/22 (13.6%) had antibodies in IgG class, 4/22 (18.2%) in IgM class and 3/22 (13.6%) in the IgA class. Anti-β2GPI antibodies were found exclusively in the patients in whom aCL antibodies were present. Consequently the presence of anti-β2GPI antibodies was confirmed in 9 out of 10 (90%) patients with aCL antibodies. Only in one woman with aCL antibodies there were no anti-β2GPI antibodies observed. The results of the measurements of aCL antibodies and anti-β2GPI antibodies are shown in *Tab. 2*.

In the patients with aCL antibodies and anti-β2GPI antibodies a statistical analysis with clinical symptoms and the presence of SSc-typical antibodies (anti-Scl-70 and ACA) using Fisher's test was done. Correlation between the presence of particular classes of antibodies with pulmonary fibrosis, pulmonary hypertension and the alterations of oesophageal function has also been performed. Our measurements showed no statistically significant correlations (for example the extent of the changes in the oesophagus did not correlate with anti-β2GPI IgG antibodies: p=0.527, whereas there was a trend of correlation with anti--β2GPI IgM antibodies: p=0.087). No statistical significance was found between the presence of aCL antibodies or anti-β2GPI antibodies and the presence of anti-Scl-70 or ACA.

Discussion

There have been reports that the presence of antiphospholipid (aPL) antibodies even in the asymptomatic patients (without thrombosis and miscarriages) indicates a greater risk of the development of vascular changes [10,11]. There are a few

Table 2. **The presence of aCL antibodies and anti-β2GPI antibodies in the patients with SSc**

Patient	aCL IgG	aCL IgM	a-β2GPI IgG	a-β2GPI IgM	a-β2GPI IgA
L.K.	9.8 (-)	9.7 (+)	2.9 (-)	28.66 (+)	1.6 (-)
J.S.	20.6 (++)	10.7 (+)	8.44 (-)	9.5 (-)	2.95 (-)
J.F.	38.6 (++)	5.8 (-)	42.21 (+)	5.95 (-)	2.5 (-)
S.P.	8.0 (-)	13.8 (+)	5.2 (-)	58.27 (+)	3.0 (±)
R.D.	7.3 (-)	12.4 (+)	7.8 (-)	8.0 (-)	15.34 (+)
A.J.	20.0 (++)	52.8 (+++)	24.44 (+)	20.18 (+)	2.5 (-)
A.Z.	4.3 (-)	9.9 (+)	40.01 (+)	10.65 (-)	2.8 (-)
H.P.	9.4 (-)	8.4 (+)	3.59 (-)	8.34 (-)	3.2 (±)
N.G.	21.6 (++)	5.4 (-)	6.74 (-)	10.8 (-)	8.5 (+)
Z.B.	7.4 (-)	50.3 (+++)	7.6 (-)	54.36 (+)	5.0 (+)

theories explaining the association between aPL antibodies and the development of vascular changes [12]. Antiphospholipid antibodies may bind to the phospholipids of the endothelial cells decreasing the release of prostacycline, which is the platelet aggregation inhibitor and a known vasodilating agent. It has also been proved that aPL antibodies inhibit protein C activation, causing an increased blood thrombosis. At present a lot of attention is paid to anti-β2GPI antibodies. It has been found that aPL antibodies do not react directly with phospholipids but instead act against β2GPI, a serum protein which has the capacity to bind to the anion phospholipids [13]. Ieko et al. [14] have found that β2GPI protects the tissue plasminogen activator (tPA) against its inhibitor (PAI-I), which decreases the fibrinolitic activity and leads to the increased thrombosis in the patients with anti-β2GPI antibodies. Anti-β2GPI antibodies in the IgG class may inhibit in vitro thrombin formation and are closely related to clinical manifestation of antiphospholipid syndrome [15]. Carreras et al. [16] have shown that anti-β2GPI antibodies have a much greater importance in the assessment of the risk of the development of thrombosis than aPL antibodies and may sometimes be detected in the absence of aPL antibodies in the standard tests.

Data concerning the frequency of the occurrence of aPL antibodies in the patients with SSc are scarce and contradicting. Different authors reported the presence of aCL antibodies in 0-63% of the patients with SSc [17,18]. Picillo et al. [4] have shown that there is an association between the presence of aCL antibodies and the worse course of SSc. However, Ihn et al. have observed a relation between the incidence of anti-β2GPI antibodies in the IgG class and pulmonary hypertension in the course of SSc [19]. In our study aCL antibodies were found in 10 (45.5%) patients with SSc, while anti-β2GPI antibodies were observed in 9 (40.9%) subjects. In 3 patients with anti-β2GPI antibodies in IgG class, there was no pulmonary hypertension contrary to the findings of Ihn et al. [19]. On the other hand similarly to Sherer et al. [20] there was no association between the presence of aCL antibodies and anti-β2GPI antibodies with systemic hypertension in our study. In the available papers there have been no data concerning the connection between aPL antibodies and the alterations in the lungs and digestive tract in the patients with SSc. In the majority of the patients (90%) a coincidence between aCL antibodies and anti-β2GPI antibodies was observed, which is confirmed by data from other studies.

The results of our study show that the prevalence of aCL antibodies and anti-β2GPI antibodies is not rare in the patients with SSc. A more detailed assessment of the relationship between the presence of aPL antibodies and organ involvement in the course of SSc requires further studies on the larger group of patients and a several years of follow-up.

Taking into account the data from other studies indicating the potential role of aPL antibodies in the development of vascular changes and the fact that vascular complications constitute a vital element of the pathogenesis of SSc, the results of our study suggest the use of anticoagulants as a standard element in the treatment of the patients with SSc. Recently there have been reports of a beneficial effect of statins in the patients with aPL antibodies, which may be explained in terms of the inhibitory effect of statins on endothelial cells simulated by anti-β2GPI antibodies [21].

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The importance of early diagnosis of systemic sclerosis

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Abstract

Systemic sclerosis (SSc) is a connective tissue disease which etiology and pathogenesis is still unknown. The vascular and immunological changes are the major elements of the SSc. The preliminary ACR criteria of SSc are the oldest criteria for rheumatic diseases and are not sensitive enough in respect to early SSc. Many authors suggest that these criteria should be extended by capillaroscopic and immunological changes. In 2001 LeRoy and Medsger proposed new criteria for SSc that could help to identify SSc patients with early stage of the disease. This will give the opportunity for the early and proper treatment.

Key words: systemic sclerosis, early diagnosis.

Systemic sclerosis (SSc) (scleroderma-hardening or sclerosis of the skin) is a connective tissue disease characterized by fibrosis and degenerative changes in the skin and the internal organs – heart, lungs, kidneys and gastrointestinal tract. The etiology and pathogenesis of SSc are unknown but immunologic abnormalities, fibroblast activation, chronic inflammation and vascular damage are considered to be the main elements of the disease [1,2].

Systemic sclerosis is divided into two major variants of sclerodema: Diffuse Systemic Sclerosis (dSSc) and Limited Systemic Sclerosis (lSSc) dependending on degree and extent of cutaneous involvement. LSSc was known as CREST syndrome, where calcinosis, Raynaud's phenomenon, esophageal hypomotility, sclerodactyly and teleangiectasia is observed [2]. These two variants of SSc differ not only in respect to the extent of skin thickening but also in the clinical course and spectrum of internal organ involvement.

In the majority of cases of lSSc the Raynaud's phenomenon is the first manifestation and may proceed skin hardening and the organs involvement for months or years. The Raynaud's phenomenon (RP) is definited as bilateral, episodic di- or triphase (pallor, cyanosis, suffusion) vascular reaction of the fingers, toes, ears or nose [3,4]. This reaction is caused by artery vasospasm. In dSSc the skin and the organs involvement are observed already in first years of the disease. In 90% of SSc patients the immunological changes (the anticentromere and antitopoisomerase-I autoantibodies) are detected. The most patients with SSc have abnormal widefield naifold capillaroscopy with the dilatation and/or avascular areas [3,5].

The American College of Rheumatology (ACR) Preliminary Clinical Criteria for Systemic Sclerosis from 1980 are the oldest criteria of rheumatic disorders [6]. In this preliminary criteria the proximal scleroderma is the single major criteria. Sclerodactyly, digital pitting scars of finger tips or loss of substance of the finger pad, and basilar pulmonary fibrosis contribute further as minor criteria in cases when proximal scleroderma is absent [5]. There are no vascular or immunological changes included in these criteria.

Now after 20 years we know that the absence of cutaneous involvement does not exclude the diagnosis of SSc, which is a mulitisystem, multistage disorder marked by variable manifestation. Difficulty in the diagnosis of the SSc may occur at the early stage prior to development of obvious skin sclerosis. Now it is known that definitive diagnosis may be delayed for several years from the onset of Raynaud's phenomenon until definite characteristic skin changes are seen [5].

During those years significant advances have occurred that have increased our understanding of the pathogenesis of the SSc. In particular it became obvious that immunological and capillaroscopic changes appear already in the earliest phase

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of the disease. The precise autoimmune serology and capillaroscopic evaluation of patients with RP have identified many persons with features of SSc who do not fulfill the preliminary ACR criteria. ACR criteria permit the diagnose of SSc in advanced stages of the disease. Since that many clinicious have suggested that the ACR classification criteria for SSc should be revised to more adequately incorporate those patients without skin sclerosis but with RP, nailfolds capillaroscopy pattern and immunological changes [3,5,7]. Those patients are mainly these with lSSc. Accordingly, Medsger and others, have observed that the ACR preliminary criteria paradoxically exclude patients who have been diagnosed by experienced clinicians as having definite SSc [3]. Therefore in 2001 LeRoy and Medsger proposed the criteria for the classification of early systemic sclerosis [3]. They suggest that typical immunology changes for SSc are: the presence of the selective autoantibodies – anticentromere, antitopoisomerase I, antifibrillarin, anti-PM-Scl, antifibrillin or anti-RNA polymerase I or III in a titer of 1:1000 or higher. Those autoantibodies should by detected by indirect immunofluorescence using HEp-2 cells as a substrate [3]. Typical capillaroscopic changes include the presence of megacapillaries, avascular areas and/or bushy capillaries.

According to LeRoy et al. for the SSc new classification the RP should be well documented for example by cold stimulation (direct observation of any 2 of pallor, cyanosis, or suffusion, objective evidence of delayed recovery after cold challenge) or by others quantitative measure like laser Doppler ultrasound, termography and others [3,8]. When the RP is documented objectively LeRoy and Medsger proposed RP as the single major criterion for the diagnosis of the most limited cutaneous SSc (lSSc). When the RP is subjective only it is suggested to include both the SSc-typical naifold capillary pattern (dilatation and/or avascular areas) and selective autoantibodies. In LeRoy early classification of SSc the lSSc (limited systemic sclerosis) was proposed when RP plus abnormal nailfold capillaroscopy or SSc selective autoantibodies are detected. LcSSc (limited cutaneous systemic sclerosis) was proposed for CREST syndrome and those patients must have fulfill criteria for lSSc and demonstrate cutaneous involvement distal to the elbows, knees and clavicles. Patients with dcSSc (diffuse cutaneous systemic sclerosis) should match criteria for lSSc and demonstrate proximal cutaneous changes (skin tautness of the arms, chest, abdomen or back) [3] (see *Tab. 1*).

We must also remember about other conditions when RP is observed. The dermatomyosistis and polyarteritis nodosa can be associated with scleroderma-like nailfold capillary abnormalities and RP but their clinical outcome distinguish them from SSc [3,4]. The RP is observed also in diabetes mellitus, hyperviscosity syndromes, hypertension and B-blocker therapy. When the RP is observed the vasculitis, systemic lupus erythematosus (SLE), Sjögren syndrome or an overlape syndrome must be excluded [3,8].

In conclusions many writers suggest that ACR preliminary criteria must have been by microvascular and autoimmune techniques completed [3,5,7]. LeRoy and Medsger considered that by adding nailfold capillary findings and anticentromere serology the sensitivity of ARA classification was improved from 33% to 92% [3].

Table 1. **Constellations of criteria for diagnosis SSc – according to LeRoy and Medsger [3]**

lSSc	lcSSc	dcSSc
RP (objective documented) **plus any one**: SSc-type nailfold capillary pattern **or** SSc selective autoantibodies **or** **RP** (subjective only) **plus both**: SSc-type nailfold capillary pattern and SSc selective autoantibodies	Criteria for lSSc **plus** distal cutaneous changes	Criteria for lSSc **plus** proximal cutaneous changes

lSSc – limited Systemic Sclerosis,
dSSc – diffuse Systemic Sclerosis,
RP – Raynaud Phenomenon

This new proposition for SSc criteria could help to create more sensitive criteria and to minimize false positive diagnoses. The new definition of early lSSc can identify those patients who should be carefully observed for internal organs involvement. Early diagnosis of internal organs involvement will give the opportunity for the early and proper treatment. On the other hand early diagnosis of SSc will allow the studies on the events involved in the pathogenesis of the disease.

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The oral cavity hygiene as the basic element of the gingival recession prophylaxis

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Abstract

The purpose of the study was the evaluation of the dental plaque and the influence of determined hygienic factors on gingival recession occurrence in 455 students of The Medical University of Białystok. All the subjects were examined in artificial light, with the use of the probe, mirror, and parodontometer. The distribution of stained dental deposits were estimated with the use of the plaque index according to Quigley and Hein. Moreover, the students were to fill a survey of their own project concerning hygienic habits. The results underwent statistical analysis.

The dental plaque was not present in 71 people. Gingival recession was revealed in 134 out of 455 subjects. The majority of medical students brushed their teeth twice a day, using medium hard toothbrush or electric toothbrush with appropriate movements and medium strength while brushing. The frequency of brushing the teeth, hardness of the toothbrush, the use of electric toothbrush, the movements during brushing the teeth, the strength of brushing, the frequency of toothbrush change, the age, and sex have significant influence on the number of recession.

The increase in the gingival recession in students is connected with: large pressure on the brush while toothbrushing, too frequent brushing and toothbrush change, the use of hard toothbrush and additional hygienic items, movements while brushing, the age (the number of recession elevates with the age), and sex (women showed more recession than men).

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Key words: gingival recession, risk factors for gingival recession, multiple recession.

Introduction

An inappropriate way of toothbrushing is the main causative factor responsible for gingival recession. There are a few elements that should be taken into consideration: inappropriate way of brushing the teeth, the use of too hard a brush, the frequency of brushing, and too much strength used while brushing the teeth [1-3]. These factors cause a repetitive gingival trauma, which leads to epithelial trabecula penetration to damaged gingival tissues, epithelial surface collapse and recession.

Gingival recession is a pathology during which the gingiva is translocated from the boundary of the enamel – cement connection to the apex [4]. Then, the tooth root surface is exposed which in turns causes the increased sensitivity to nutritional and termic stimuli and the possibility of root caries and non-carious defects at the neck. It means dentition esthetics defect and teeth loss fear for a patient.

Clinical studies confirmed the occurrence of this type of recession in people with strict oral cavity hygiene (i.e. those who do not reveal dental plaque). Pro-health awareness presented by medical students sometimes leads to "too ideal" hygiene, which can be displayed by too frequent and too long brushing.

It has been proven that gingival recession occurs both in people who care about oral cavity hygiene and those who do not [5]. Lack of hygiene induces inflammatory reaction leading to connective tissue attachment loss at the surface of the teeth and recession [6].

The purpose of the study was the estimation of the dental plaque and the influence of determined hygienic factors on gingival recession.

Tabela 1. **The dental plaque index according to Quiglen and Hein in 134 subjects with diagnosed gingival recession**

Sex Number of subjects	The scale of dental plaque evaluation according to Quiglen and Hein									
	0	1	2	3	4	5	2+3	3+4	3+5	4+5
Women 100	59 83.1%	8 66.7%	2 66.7%	11 64.7%	3 42.9%	0 0%	2 100%	9 69.2%	5 83.3%	1 50%
Men 34	12 16.9%	4 33.3%	1 33.3%	6 35.3%	4 57.1%	1 100%	0 0%	4 30.8%	1 16.6%	1 50%
Total 134	71	12	3	17	7	1	2	13	6	2

Material and methods

The examined group consisted of 455 students of The Dentistry Department and The Medical Department of The Medical University of Białystok. The age of the subjects ranged from 18 to 32 years.

The group was examined in clinical rooms of The Institute of Conservative Dentistry and Parodontium Diseases of The Medical University of Białystok. The examination took place in artificial light with the use of the dental probe, mirror, and parodontometer.

After staining the tooth surfaces with Butler's liquid, the distribution of stained deposits were assessed using the plaque index according to Quigley and Hein. The criteria for the evaluation were as follows: 0 – lack of plaque; 1 – single plaque islets; 2 – plaque trabeculas at the edge of gingival; 3 – plaque covering 1/3 of the tooth surface at the neck; 4 – plaque covering 2/3 of the tooth surfaces at the neck; 5 – the plaque covers the whole surface of the examined tooth. In order to facilitate the evaluation and obtain precise distribution of the plaque, the following additional determinants were used: 2+3 – the plaque trabeculas occurring at the edge of the gingival and simultaneously covering the 1/3 of the tooth surface at the neck; 3+4 – the plaque extends simultaneously in the 1/3 of the tooth surface at the neck and covers 2/3 of the tooth surface; 3+5 – the plaque extends simultaneously in the 1/3 of the tooth surface at the neck and covers the whole surfaces of the examined teeth; 4+5 – the plaque covers 2/3 of the tooth surface and simultaneously the whole surfaces of the teeth.

After the examination, the students filled the survey concerning hygienic habits.

The results were analyzed statistically (Mann-Whitney test and Pearson Chi^2 test, Kendall tau coefficient, the model of multiple regression).

Results

In 134 subjects with recession the dental plaque was stained and the case history was taken. The students also filled the survey concerning hygienic habits (*Tab. 1*).

The examination and staining the plaque were not announced, the students were examined after their classes thus they had no opportunity to brush their teeth. The dental plaque was not observed in 71 patients with recession. Twelve cases (8 women and 4 men) showed code 1, single islets of the dental plaque. Code 2 was seen in 3 students; the plaque trabeculas at the edge of the gingival, mainly the lingual and palatal surfaces of the lateral upper and lower teeth. In patients with diagnosed gingival recession – the labial surfaces at the teeth with recession were also affected.

Butler's fluid stained the plaque that covered 1/3 of the tooth surface at the neck (code 3) in 17 examined students. Those were mainly lateral teeth, premolars and molars, and more often lower at the lingual side than the upper ones; and at the palatal side in the upper teeth.

However, the dental plaque covering the 2/3 of the tooth surface at the neck (code 4) occurred only in 7 people and it was mainly visible in the lingual surface of the lower incisors and canines.

Only one person (a man) had the plaque covering the whole surfaces of the frontal teeth at the labial sides and the 8th teeth on both surfaces (code 5).

In the evaluation of the oral cavity hygiene it was difficult to determine the code of the plaque occurrence in 21 people. Thus, the combined evaluation was incorporated: code 2+3, 3+4 and 3+5, 4+5. The group revealed bad oral hygiene with 2 women with the dental plaque of the code 2+3, 13 people presented the code 3+4, 6 – the code 3+5, and one man and one woman the code was 4+5.

The gingival recession was observed in 134 subjects out of 455 students (29.45%), more in women than in men (31.74% and 24.28%, respectively). The pathological condition concerned mainly the tooth labial or buccal surfaces. The ratio of the percentage of teeth with gingival recession to the number of all examined teeth was approximately 5.09%.

About 4.84 of the exposed surface of the root was to one examined student with the mean recession number in women was 4.74 and in men was 5.15. The most common localization, in case of subjects with gingival recession, were premolars and the lower canines and incisors.

On the basis of the survey results (*Tab. 2*), it was stated that the majority of medical students brushed their teeth twice a day (219 subjects) while most of those with diagnosed gingival recession – 3 times a day (73 people). The data are statistically significant. The medium toothbrushes were used by 343 students (96 with the gingival recession) and electric brushes, as the basic everyday oral hygiene, were used by 347 students and only 31 with the gingival recession. There was no correlation stated between the kind of toothbrush and the gingival

Table 2. **The variables influencing gingival recession**

Factors affecting gingival recession		Number of subjects in groups	Number and percentage (%) of subjects with gingival recession in groups
Frequency of toothbrushing	1	20	4 (20%) **
	2	219	57 (26%)
	3	216	73 (33%)**
Kind of toothbrush	Hard	57	22 (38.6%)*
	Medium	343	96 (28%)*
	Soft	55	16 (29.9%)
Electric toothbrush	Yes	347	31 (8.9%)
	No	108	103 (95.4%)
Movements while toothbrushing	Regular	410	126 (30.7%)*
	irregular	45	8 (17.7%)*
Strength of brushing	Strongly	107	44 (41.1%)**,***
	Average	340	87 (25.6%)***
	Weakly	8	3 (37.5%)**
Frequency of toothebrush change	<3 months	117	49 (41.9%)***
	every 3 months	237	63 (26.6%)
	>3 months	101	22 (21.8%)***
Additional hygienic items	Yes	340	130 (38.2%)***
	No	115	4 (3.5%)***

*p<0.05 ** p<0.001 ***p<0.0001

recession occurrence. The majority (410 subjects) made normal movements while brushing the teeth. However, traumatic movements (horizontal ones) were used by 45 students and 8 ones with the gingival recession. The data are statistically significant. It was also determined that most of the students chose medium strength while brushing the teeth (340 subjects out of whom 87 with the diagnosed gingival recession), more strength was used by 107 students – 44 with the diagnosed gingival recession).

The statistical analysis showed a very strong correlation between the strength of brushing and the recession (the bigger strength, the more frequent cases of the recession observed). We learnt that 237 people changed their toothbrushes every 3 months (63 subjects with the gingival recession) and more often than every three months – 117 students and 49 people with the gingival recession. The data show statistical dependence. Additional hygienic items (dental floss, toothpick, mouthwash) were used by the majority of students.

In the construction of multiple regression model (*Tab. 3*), the number of recession is considered the dependent variable and the frequency of brushing, the hardness of toothbrush, the use of electric toothbrush, movements while brushing, the strength of pressure, the frequency of toothbrush change as well as the sex and the age were independent variables. F test shows that independent variables have a great impact on the number of recession ($F=33.556$; $p<0.01$; $R2=0.041$; standard estimation error: 2.77).

The value of regression coefficient B, the estimation error for B and the level p were given for each independent variable in *Tab. 3*. The frequency of brushing teeth (each additional brushing gave the increase of recession number by 0.08), the hardness of toothbrush (while using medium and soft ones the number of recession decreased by 0.03), the use of electric brush caused the drop in recession number by 0.03, horizontal movements increased the recession by 0.09, light pressure used caused recession decrease by 0.16, the frequency of brush change (if the brush was changed every 3 months or more seldom, the number of recession dropped by 0.13), the age (the increase was observed by 0.14), and sex (recession was higher in women than in men) have all the great impact on the number of recession.

Table 3. **Multiple regression of analyzed factors**

Variable	Regression coefficient B	SE B	P value
Frequency of toothbrushing	0.083	0.246	p=0.0989
Kind of toothbrush	-0.031	0.478	p=0.0513
Electric toothbrush	-0.031	0.486	p=0.521
Movements while toothbrushing	0.095	0.047	p<0.05
Strength of brushing	-0.156	0.047	p<0.05
Frequency of toothebrush change	-0.126	0.049	p<0.05
Age	0.141	0.068	p<0.05
Sex	-0.429	0.285	p=0.357

Discussion

Numerous epidemiological reports on the gingival recession have pointed to the fact that that pathology became society-wide. National and foreign literature has given the basis to state that last years caused the number of the gingival recession to increase in young people [1,7-9]. Checcchi et al. [3] showed the highest frequency of recession in Italian students (64%) while

significantly lower percentage (35%) was observed in dentistry students of Medical Universities in Wrocław and Gdańsk [8,9] and the lowest value presented the students in Białystok (29.4%).

The students evaluated in our study had a very high oral hygiene. Thus, hygiene neglect can be hardly considered to be an essential cause of the gingival recession. Moreover, the survey revealed differences between the students of dentistry and medical ones as far as professional care of the oral cavity is concerned.

The vast majority of dentistry students use additional hygienic items regularly. Unfortunately, that is the group of subjects that developed "too ideal" a hygiene due to pro-healthy consciousness. And that can not only influence the occurrence of recession but also non-carietic defect appearance, which can disturb dentition esthetics.

The model of multiple regression indicates the effect of pressure on the brush, brushing techniques, the brush hardness, frequency of brushing, and irregular change of the brush on the increase of recession number. Checccchi and Kozłowski [3,9] also showed the relationship between the oral cavity hygiene and recession.

Our as well as other authors' observation have presented the relation between improper and exaggerated oral hygiene and the gingival recession occurrence. Those factors, although significant, are not decisive as for all etiopathological conditions of recession. We should not forget about such factors as abnormal setting of the teeth in the arch, occlusion defects, orthodontic treatment, surgical procedures of parodontium, traumatic occlusion, genetic and anatomical conditions, smoking, and stress that have negative influence on parodontium tissues.

Nowadays, the problem of the gingival recession becomes for a dentist a serious society-wide problem, which requires individual and, which is most important, cautious management of each case. The examination of all possible recession factors, their elimination or at least diminishment is of great importance in the treatment. Such measures, sometimes with surgical intervention, can provide permanent effect of therapy.

Conclusions

The increase in the gingival recession in students is connected with: large pressure on the brush while toothbrushing, too frequent brushing and toothbrush change, the use of hard toothbrush and additional hygienic items, movements while brushing, the age (the number of recession elevates with the age), and sex (women showed more recession than men).

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Factors influencing the maintenance of nicotine abstinence among the habitants of the region of Łódź and Kalisz in the years 1996-2003

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Abstract

The aim of the study was to determine the factors allowing non-smoking for the next 2 years after a 5-year period of non-smoking. A questionnaire study was performed in October 2003 among 449 of men and women chosen from among 1700 contest' 'Quit & Win' Competition participants, which was ending in 1996 2nd International Anti-nicotine Campaign "Quit & Win" in Poland in the region of Łódź and Kalisz. Chosen people were respondents, who during studies conducted in the years 1998 and 2001 stated that they were not smoking at all since their participation in the contest. Filled-in questionnaires were sent back by 296 people (65.9%). The analysis showed that the surveyed with elementary education more rarely than people with other level of education could preserve in non-smoking habit for the next 2 years after a 5-year period of non-smoking. Further maintenance of nicotine abstinence was not dependent on: age, sex, the place of living, the marital status and the source of income.

Key words: nicotine abstinence, "Quit & Win" Competition, socio-demographic features.

Introduction

The problem of maintenance nicotine abstinence is a crucial element of the efficiency of health promotion programmes evaluation [1-3]. Publications show that some people comprised with health education regarding cigarette smoking can preserve non-smoking habit while others cannot break it [4,5]. The efficiency of breaking the habit depends on the degree of nicotine – addiction of the smoker, which is measured with the use of Fagerström Test of Nicotine Dependence (FTND), and the period of time of being addicted [6]. The aim of this study was to determine the factors allowing non-smoking during the next 2 years after a 5-year period of nicotine abstinence.

Material and methods

The study using a mail questionnaire, was conducted in October 2003 among 449 men and women, of 1700, who took part in "Quit & Win" Competition, which was ending 2nd International Anti-nicotine Campaign "Quit & Win" in Poland. The questionnaire was addressed to those, who in the studies conducted in the years 1998 and 2001 had stated, that are still non-smokers. A questionnaire filled-in in 2003 was returned by 296 respondents and it was 65.9% of all sent questionnaires. Respondents living in the region of Łódź sent back 113 of 174 questionnaires sent to them and respondents from the region of Kalisz – 183 out of 275 of questionnaires sent to them. In both regions a similar percent of heavy smokers (those smoking more than 10 cigarettes per day and smoking for longer than 10 years) took part in the contest. All participants from the region of Łódź were large cities inhabitants, while most of the participants from the region of Kalisz lived in small towns or in the country.

To analyse the material gathered we used descriptive methods and the methods of statistical conclusions. To evaluate whether the relations between analysed features are statistically significant, we used the independence test chi^2. The power of relation was established with φ-Yule index.

Results

After the analysis of answers of 296 respondents in October 2003 it turned out, that 274 people were still not smoking dur-

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Table 1. **Factors having influenced on nicotine abstinence maintenance in a studied group**

Socio-demographic features		Total	People, who did not preserve in a 2-year nicotine abstinence after a 5-year period of non-smoking		People, who preserved in a 2-year nicotine abstinence after a 5-year period of non-smoking		chi² value and p value
		n	n	%	n	%	
Age	30-49	108	7	7.3	101	92.7	0.224 p=0.64
	50 and above	188	15	8.7	173	91.3	
Sex	Men	182	11	6.1	171	93.9	1.324 p=0.25
	Women	114	11	9.7	103	90.3	
Region	Łódź	113	12	10.6	101	89.4	2.001 p=0.16
	Kalisz	183	10	5.5	173	94.5	
Marital status	Married	245	19	7.8	226	92.2	0.22 p=0.45
	Single	51	3	5.9	48	94.1	
Education	Elementary	63	10	15.8	53	84.2	8.29 p=0.004
	Other	233	12	5.2	21	94.8	
Source of income	Professional work	153	12	7.8	141	92.2	0.078 p=0.78
	Other sources	143	10	7.0	133	93.0	

ing the next 2 years after a 5-year period of nicotine abstinence (7 years since the moment of participation in the competition, that is since 1996) – *Tab. 1*. Only 22 people, sending filled questionnaire stated, that they could not preserve in the abstinence within the next 2 years. Respondents stating in 2003 that they maintain the nicotine abstinence for the next 2 years, after a 5-year period of non-smoking, made up 92.6%. In the region of Łódź, people who sustained in nicotine abstinence in the analysed period of time, made up 89.4%, and in the region of Kalisz they made up 94.5%. The maintenance of non-smoking for the next 2 years after a 5-year period of nicotine abstinence was not depending on the place of living (p=0.16). Any significant relations between sex and the fact of nicotine abstinence for the next 2 years were not observed. Similar percent of men – 93.9% and women – 90.3% maintained nicotine abstinence in the analysed period of time. Age of the respondents has not had a significant influence on the fact of maintenance of nicotine abstinence. Both younger respondents (up to 49 year of age) and older (over 50 years old) in a similar percentage were not smoking for the next 2 years – 92.7% and 91.3%, respectively. The education level has had some influence on maintenance of nicotine abstinence for the next 2 years after a 5-year period of nicotine abstinence (p=0.0041). People with elementary education in a lower percentage (84.2%), in comparison to respondents having other levels of education (94.8%), who preserved in a non-smoking habit for the next 2 years. The relation was not very strong (φ =0.165). The analysis showed that there was not a statistically significant relation between the source of income and the fact of non-smoking for the next 2 years after a 5-year period of nicotine abstinence. After the next 2 years 92.2% of respondents whose source of income was professional work, still were not smoking and 93.0% of people, whose source of income was other than their profession. The marital status also did not have any influence on non-smoking for the next 2 years after a 5-year period of nicotine abstinence. Married people, as well as single people, in a similar percentage maintained non-smoking during the analysed period of time (92.2% and 94.1%, respectively).

Discussion

There are not many publications in Poland, showing the relations between different socio-demographic features and the fact of nicotine abstinence maintenance [7,8]. The conducted study shows that the maintenance of nicotine abstinence was connected with having a higher than elementary education level. Studies conducted in the years 1997-1999 showed that in Poland the percentage of people who preserved the nicotine abstinence was the highest in a group of respondents with uncompleted university education and full university education (75% of men, 84% of women) [7]. The relation between the level of education and the fact of smoking confirmed studies conducted in Great Britain and Wales among 1911 men and women. Most smokers were among uneducated people. People with low education had more problems with breaking the habit and were returning to smoking more often than educated people [8]. The same study showed, in contrary to studies performed between the region of Łódź and Kalisz, the dependence between sex and the fact of returning to smoking.

Zatoński shows, that the highest and the most systematic increase of number of people maintaining the nicotine abstinence in the last 25 years was observed among people with high socio-economic status [7]. All-Polish studies, conducted in 1999 showed that people from families with the highest income twice more often maintained the nicotine abstinence than the poorest ones [9]. Studies performed in United States of America on a population of 1323 men and 1484 women also confirmed the connection between nicotine abstinence and high socio-economic status [10]. Also other publications confirmed the connection between high socio-economic status and the fact of non-smoking maintenance [11-14]. On the other hand, Glendinning showed no relation between socio-economic status and the fact of nicotine abstinence maintenance [15].

Conclusions

1) The most important factor, which influenced a further 2-year nicotine abstinence maintenance after a 5-year period of non-smoking among the habitants of the region of Łódź and Kalisz was the level of education.

2) The influence of age, sex, the place of living, the marital status and the source of income on nicotine abstinence maintenance was not observed during the analysed period of time.

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The relation between antioxidative ability and the diet of young swimmers

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Abstract

Purpose: **The comparison of nutrition of children with high level of physical activity in dependence on antioxidative efficiency expressed in Ferric Reducing Ability of Plasma – FRAP adapted for saliva.**

Material and methods: **The group consisted of 74 pupils (43 boys and 31 girls) from swimming classes of Sport Championship School in Kraków. FRAP was measured in saliva with the use of colorimetric method and was presented in calculation per 1 gram of proteins.**

Three groups were separated on the basis of FRAP/ /protein (g) values distribution of 15 and 85 percentile. In each group the comparison of particular nutritional components was done with taking into consideration the 24 hour nutritional recall.

Results: **The statistically significant differences in nutrition were observed only in girls group in dependence on the FRAP values. These differences concerned energy and carbohydrates intake. Fats always provided more then 30% of energy, especially among children with high FRAP/ protein (g) value – 34.3%. The shortage of proteins was not observed. The mean intake of calcium, and zinc was below and phosphorus, vitamin A and C intake was above the recommended level.**

Conclusions: **Non-enzymatic mechanisms of antioxidative efficiency (FRAP) are partially being modified by nutritional factors.**

Key words: antioxidative ability (FRAP), children, physical activity, diet.

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Introduction

Raising the level of physical efficiency in the adolescent period and keeping it in the middle age results in better health in the older age, what is being rescheduled for better efficiency of the respiratory and cardiovascular system. In addition people leading the active style of life are less threatened of the occurrence of a number of diseases like arteriosclerosis, the coronary artery disease, hypertension, diseases of the respiratory system [1-3]. Published data inform of profitable impact of the physical activity on antioxidative system ability [4-6]. However, it is important that physical exercises are being executed regularly since only this form of physical effort is influencing profitably the efficiency of antioxidative system [7-9]. In case of excessive burdening with exercises of the organism that is not accustomed to the regular training some disorders of the balance of oxidative-antioxidative system [10] may occur. The sudden increase in demand for oxygen results in production of large quantities of reactive oxygen species, which with the fall of antioxidative capacity leads to the development of oxidative stress [11-13]. The organism is protected from the excess of reactive oxygen species by antioxidative mechanisms. The most important internal antioxidative mechanisms are: enzymatic intracellular line (catalyze, glutathione peroxidaze) which is effective at the correct level of such microelements like copper, manganese, iron, selenium; antioxidants in the blood serum (albumins, transferin, laktoferin, bilirubin, urinary acid); "free radicals sweepers" i.e. low-particle antioxidants like vitamins: A, C, E. Nutrition has a major impact on cellular levels of the "free radicals sweepers". It is important that the diet is rich in fresh fruit, vegetables and fish which are the outstanding source of insatiable fatty acids which are necessary for correct absorbing and the usage of vitamins soluble in fats. Taking under active remark physical activity, it is also important to preserve correct proportions, both in quality and quantity of food components [14,15].

The purpose of presented studies was to compare the methods of feeding in children who are burdened with the physical

Table 1. **The mean level of energy and main nutrients intake in daily nutritional ration depending on FRAP values and gender**

A. **Girls**

Nutrients	Units	I group		II group		III group		p< 0.05
		mean	SD	mean	SD	mean	SD	
Energy	kcal	2898.01	559.81	2361.15	577.66	2382.31	468.65	I : II
Proteins (total)	g	99.81	13.34	83.78	16.44	91.92	12.73	NS
Fats	g	93.18	17.48	89.02	24.73	80.36	12.35	NS
Saturated Fatty Acids (SFA)	g	34.99	5.66	32.92	9.47	32.98	6.13	NS
Polyunsaturated Fatty Acids (PUFA)	g	12.48	5.18	12.85	4.99	8.78	1.70	NS
Cholesterol	mg	395.09	53.64	427.99	137.38	423.29	71.03	NS
Carbohydrates	g	439.25	111.19	325.17	90.20	339.65	88.95	I : II
Fibre	g	28.35	9.99	21.28	6.97	20.03	6.63	NS

B. **Boys**

Nutrients	Units	I group		II group		III group		p<0.05
		mean	SD	mean	SD	mean	SD	
Energy	kcal	2261.39	296.53	2441.30	603.44	2547.10	732.94	NS
Proteins (total)	g	87.37	20.86	89.73	20.52	88.10	24.61	NS
Fats	g	83.61	16.55	83.87	22.51	109.31	38.33	NS
Saturated Fatty Acids (SFA)	g	30.44	8.08	31.43	10.22	41.16	16.32	NS
Polyunsaturated Fatty Acids (PUFA)	g	11.60	3.38	11.78	3.08	15.76	7.98	NS
Cholesterol	mg	441.75	148.73	363.90	154.95	455.07	268.79	NS
Carbohydrates	g	306.88	23.93	352.11	100.68	324.13	94.62	NS
Fibre	g	19.40	2.60	23.34	7.42	23.40	6.67	NS

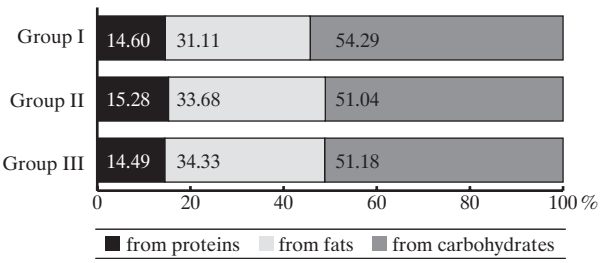
effort and have different levels of FRAP (non-enzyme determinant of antioxidant efficiency).

Material and methods

Seventy-four students were included into the study (43 boys and 31 of girls) from the swimmers classes of Krakow's School of the Sports Championship. Average age was 10.57±0.32 years. Total antioxidative status was measured in saliva on the basis of Ferric Reducing Ability of Plasma (FRAP). FRAP was being measured with the colorimetric method in the saliva and expressed in mmol/l and its values were compared with total amount of proteins per gram. The median, standard deviation, 15 and 85 percentiles were calculated. All studied children were divided into three groups: group I – children with FRAP values below 15 percentile, group II – children with FRAP values in the interval between 15-85 percentile, group III – children with FRAP values above 85 percentile. The comparison in above mentioned groups in the field of received substantial components was made. The evaluation of actual food consumption in the groups was done using 24-hour nutritional recall. The recall was gathered for 2 week days and weekend day in accordance to the one recommended in Poland, prepared by The National Food and Nutrition Institute in Warsaw "Album of products and meals portions". The mean energy value and the levels of basic food components (proteins, fatty acids, carbohydrates) and chosen vitamins (A, C, B1, B2, PP) and minerals (calcium, phosphorus, magnesium, iron, zinc) were calculated without taking into account technological loses. These values were compared with recommended level of intake for Polish children [16].

All statistical calculations were made using the Microsoft™ Excel 2003 PL. The differences between the groups were calculated using the Kolmogorow-Smirnow non-parametric test.

Figure 1. **The participation of proteins, fat and carbohydrates in daily energy intake in all examined groups**



Results

Average FRAP values for groups: I group (<15 percentile): 34.47 μmol/g of proteins (6 girls and 6 boys); II group (15-85 percentile): 80.98 μmol/g of proteins (20 girls and 31 boys); III group (>85 percentile): 410.26 μmol/g of proteins (5 girls and 6 boys). The analysis of daily nutrition rations allowed to assess the mean intake of main nutrients (*Tab. 1*) and their share as an energy source in each group (*Fig. 1*).

The intake of proteins calculated from the recalls was 10-30% above the recommendation (recommended value for 10-12 years old Polish girls and boys is about 75 g/day). The amount of energy derived from proteins was about 15%. The smallest percentage was in the group III and the biggest in group II. Fats always provided more then 30% of energy,

Table 2. **The mean intake of minerals and vitamins in daily nutritional rations among girls and boys with different FRAP/protein (g)**

A. **Girls**

Vitamins & minerals	unit	I group		II group		III group		p<0.05
		mean	SD	mean	SD	mean	SD	
Calcium	mg	983.30	272.92	801.97	247.91	791.18	256.74	NS
Phosphorus	mg	1591.84	251.01	1363.79	282.54	1414.20	144.29	NS
Magnesium	mg	343.30	72.52	273.80	76.27	267.14	60.21	NS
Iron	mg	14.88	3.95	11.28	3.23	10.91	1.48	I : III
Zinc	mg	12.16	2.26	9.70	2.35	9.82	1.58	NS
Vitamin A	μg	1818.88	1508.36	1495.99	915.22	1436.13	1017.43	NS
Thiamine	mg	2.10	0.72	1.38	0.46	1.46	0.34	NS
Riboflavin	mg	2.11	0.27	1.88	0.49	1.80	0.36	NS
Niacin	mg	21.36	6.30	16.48	6.13	20.74	2.98	II : III
Vitamin C	mg	183.39	123.77	166.55	92.54	128.76	72.99	NS

B. **Boys**

Vitamins & minerals	unit	I group		II group		III group		p<0.05
		mean	SD	mean	SD	mean	SD	
Calcium	mg	757.96	284.42	802.20	269.46	710.55	193.73	NS
Phosphorus	mg	1341.90	289.92	1416.50	334.94	1404.15	373.84	NS
Magnesium	mg	259.80	37.54	296.39	84.07	295.77	87.42	NS
Iron	mg	12.49	2.16	13.08	3.24	11.93	4.15	NS
Zinc	mg	9.93	2.09	10.38	2.40	10.68	3.28	NS
Vitamin A	μg	1737.14	1152.78	1245.42	673.43	1591.03	840.62	NS
Thiamine	mg	1.59	0.30	1.75	0.53	1.41	0.59	NS
Riboflavin	mg	2.09	0.64	1.97	0.56	1.83	0.48	NS
Niacin	mg	19.34	4.89	20.28	5.91	21.97	6.27	NS
Vitamin C	mg	96.63	14.37	157.93	108.86	147.92	69.61	I : II

Table 3. **The percentage of norm realization on vitamins and minerals in daily diet in studied groups**

A. **Girls**

Vitamins & minerals	unit	Recommended level	I group (%RL)	II group (%RL)	III group (%RL)
Calcium	mg	1200	81.94	66.83	65.93
Phosphorus	mg	900	176.87	151.53	157.13
Magnesium	mg	300	114.43	91.27	89.05
Iron	mg	14	106.27	80.55	77.94
Zinc	mg	16	76.02	60.65	61.36
Vitamin A	μg	1000	181.89	149.60	143.61
Thiamine	mg	1.5	140.22	92.20	97.20
Riboflavin	mg	1.9	111.14	98.97	94.63
Niacin	mg	20	106.78	82.41	103.71
Vitamin C	mg	70	261.99	237.93	183.95

B. **Boys**

Vitamins & minerals	unit	Recommended level	I group (%RL)	II group (%RL)	III group (%RL)
Calcium	mg	1200	63.16	66.85	59.21
Phosphorus	mg	900	149.10	157.39	156.02
Magnesium	mg	300	86.60	98.80	98.59
Iron	mg	16	78.06	81.73	74.55
Zinc	mg	13	76.37	79.82	82.15
Vitamin A	μg	800	217.14	155.68	198.88
Thiamine	mg	1.3	122.44	134.52	108.59
Riboflavin	mg	1.6	130.52	123.19	114.48
Niacin	mg	18	107.46	112.66	122.03
Vitamin C	mg	70	138.05	225.62	211.32

especially among children with high FRAP/protein (g) values (34.3%). It was due to excessive intake of saturated fatty acids. The high intake of fats was concomitant with too low intake of carbohydrates. The amount of dietary fiber was always close to minimal recommended value (about 21 g/day in all examined children), excepted for girls from group I. Also girls from group I differed from the other two groups in regard of energy intake and the energy sources. It was shown that the intake of carbohydrates was higher than that of cholesterol only in group I, which was exactly opposite to situation in the group II and III. The statistical significance was only observed between group I and II (in case of group III it was very near of statistical significance) (*Tab. 1*).

The mean intake of chosen vitamins and minerals is shown in *Tab. 2* and *Tab. 3* separately for girls and boys because of different Polish recommendations for them.

In all groups very low intake of calcium, zinc and iron was noted (in case of iron statistically significant difference was found in girls from group I and III). The dietary deficit of above mentioned minerals was present without regarding the value of FRAP/protein (g). The highest deficit of dietary calcium and zinc was found in boys from the group III (59.2% of the norm) and the lowest dietary calcium deficit among girls from the group I. In case of iron, deficiency was not present only in girls from the group with the lowest FRAP values. From the remaining analyzed vitamins and minerals the oversupply (in the relation

to the recommended standards) was observed. Also statistically significant differences were present in case of Niacin (girls form group II and III) and Vitamin C (boys from group I and II).

Discussion

The increase in energy demand which takes place during the intensive, repeatable physical activity must find its reflection in the increased quantities of nutrients in the diet. The energy value adapted to the needs of the organism and the suitable structure of daily rations may influence significantly personal capacity to take the desired exercise. Energy demand is dependent on the intensity, the elapsed time and the frequency of the training, e.g. the amount of energy used for running or cycling is around 15-20 times bigger than energy used up during resting. The average consumption of energy is around 0.8 kcal/kg/km during the march and is increasing to about 1.1 kcal/kg/km during the run, and ranges (depending on the style and on the speed that the swimmer wants to reach) from 2 to 5 kcal/kg/km. Moreover after the intensive effort the tissue metabolism does not return at once to the value during rest, as was shown in the studies performed on athletes. It was shown that often up to 12 hours (and sometimes over 24 hours) after the end of the physical effort, the tissue metabolism has sometimes maintained itself on the considerably higher level. Only persons trained suitably can afford such energy expenses through longer periods of time but they must also be prepared dietary suitably to take up the desired exercises [17,18].

Generally the conviction that all athletes should receive the protein rich diet exists. It is tied with muscular mass building during the increased trainings. The insufficient supplementation of proteins may lead to the drop of the muscular mass, as well as to the impairment of regeneration processes. However, there are no studies which would suggest that increased protein supply increases the synthesis of muscular proteins. It's shown that their excess is utilized as the substratum in tissues metabolism. It doesn't mean however, that it isn't necessary in case of athletes to give bigger quantities of proteins in diet because one should remember about the increased protein oxidization during the physical effort.

Adequate supplementation of mineral components and microelements in the diet is equally important, because they are the components (co-enzymes) of numerous enzymes which catalyze biochemical reactions of the organism, and in that way influence physical efficiency. Deficiencies of iron in daily rations that take place in children and adolescents are able to lead to gentle deficits which may manifest in bad moods, pains, dizziness, sleeping and concentration disorders.

Results obtained in our study point the lack of dissimilarities in the method of feeding children with various antioxidant efficiency. Deficiencies are present in regarding the same food components in all studied subjects. So the method of feeding doesn't find reflection in FRAP/protein values (g) being one of indicators of non-enzymatic line of antioxidative efficiency of the system. Our study tied with data from world literature, let us observe worrying trends which concern young people. First significant deficiencies of substantial components of the diet were found in children who require specially balanced diet. Moreover, our data put forward the significance of correct physical development in the connection with respiratory-circulation system efficiency, which only may be reached at the training taken some more suitably, in order to reach the potential chances of the young organism.

Conclusions

Use of samples of saliva in the present study must be seen as an attempt to find out a simple, non-invasive and easy to obtain sample, suitable for frequently repeated determinations of antioxidative mechanisms. However, it seems that non-enzymatic mechanisms of antioxidative efficiency FRAP are partially being modified by nutritional factors.

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Overweight and obesity and their determinants among men from Podlasie region in the years 1987-1998

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Abstract

The goal of the study was to determine the frequencies of occurrence of obesity and overweight among men from Podlasie region of Poland, as well as nutritional and environmental factors related to these conditions.

During 9-year period (1987-1998), dietary habit of each of 556 men was evaluated three times using 24-hour consumption questionnaire. At the same time body mass index (BMI) was also calculated.

BMI increased significantly from 26.2 kg/m^2 to 27.6 kg/m^2 during discussed period, while percentage of overweight grew up from 62.7% to 73.2% and percentage of obesity rose from 14.5% to 22.5%. Executed multiple regression analysis revealed a variety of predictors of obesity and overweight. Among nutritional factors, the increase of energy and carbohydrates (especially saccharose) in diet were the reasons of increasing BMI. Considering psychological, sociological and economical features, multi-shift work provoked increase of BMI, while decrease of BMI was induced by smoking.

Observed increase of spread of overweight and obesity among men, had its nutritional and environmental reasons.

Key words: men, overweight, obesity, dietary habit, environmental factors, a prospective study.

Introduction

Obesity is a risk factor of many contemporary diseases, such as coronary heart disease, hypertension, diabetes mellitus and cancer. Obesity itself induces also other risk factors of coronary heart disease, such as hiperlipidemia, hypertension and diabetes mellitus [1-4].

The main cause of increasing obesity is positive energy balance, arising from improper nutrition and from the other hand from low physical activity. The development of populations in last half-age is accompanied by rapid increase of overweight and obesity, which cannot be stopped and therefore is called an epidemic or even a pandemic of obesity [5-7].

In this paper we decided to evaluate the occurrence of overweight and obesity in men inhabitants of Podlasie region and refer it to the dietary habit and other environmental determinants.

Material and methods

The study was conducted in the years 1987-1998 and it was concerning men, inhabitants of north-eastern region of Poland. All participating 556 men were examined three times. First study was conducted in the years 1987-1989, the second one in the years 1991-1993 and third in the years 1996-1998.

Based on the measurement of men' height and weight we calculated the body mass index (BMI). The value of BMI was referred to: age, the period of study birth cohort, physical activity, the character of work, education, work shifts, the marital status, the number of people in the family, the income per person in a family, smoking, leisure time, the skill to evaluate own nutrition and the features consisting the A model of behaviour (the need of achievements, domination tendency, aggressiveness, behaviour dynamics, hurry and impatience).

The quantitative evaluation of nutrition was conducted with the use of 24-consumption questionnaire. Based on quantity and kind of consumed products and meals we calculated the nutritive value of daily consumption.

To determine the influence of nutritional and environmental factors on the BMI, a multidimensional linear regression was used. In statistical analysis we used SAS statistical set. To com-

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Table 1. **Body mass index (BMI) of 556 men examined three times in the years 1987-1998. And the number and percent of people in distributed classes of BMI (according to WHO)**

Examined parameter		I study	II study	III study	Statistically significant differences
BMI	Mean	26.2	26.8	27.6	I-II, II-III, I-III*
	SD	3.5	3.8	3.8	
BMI<18.5	n	1	1	0	
	%	0.2	0.2	0	
8.5≤BMI<25	n	206	187	149	I-II-III**
	%	37.1	33.6	26.8	
25≤BMI<30	n	268	258	282	
	%	48.2	46.4	50.7	
30≤BMI<35	n	72	97	104	I-II-III**
	%	12.9	17.4	18.7	
35≤BMI<40	n	9	10	19	
	%	1.6	1.8	3.4	
BMI≥40	n	0	3	2	
	%	0	0.5	0.4	

* Dunn test ** χ^2 test

Table 2. **The influence of energy value of 24-hour consumption on body mass index of 556 men. Linear regression analysis included age, period of study and cohort were included additionally**

Independent variables / Dependent variable		Age Δ=1.0 year	Differences between periods		Differences between cohorts		Energy value of the diet Δ=1.0 kcal
			I-II	I-III	A-B	A-C	
BMI	Δ	0.011	0.53	1.21	-0.48	-0.96	0.0001
	p	0.84	0.02*	0.02*	0.48	0.38	0.03*

* statistically significant variable

pare the BMI between particular periods of study we used Dunn test. The evaluation of the significance of change of the number of particular BMI classes in the next studies during 9 years was done based on χ^2 test. Hypotheses in all statistical tests were verified at significance level $\alpha=0.05$.

Results

The value of the body mass index of men during 9 years is presented in *Tab. 1* and *Fig. 1*. Body mass index (BMI) increased significantly from 26.2 kg/m^2 in the 1st study to 27.6 kg/m^2 in the 3rd study. The percent of men with overweight also increased (BMI≥25 kg/m^2) from 62.7% in the 1st study to 73.2% in the 3rd study, and at the same time in a group of obese men (BMI≥30 kg/m^2) an increase of percent from 14,5 % in the 1st study to 22.5% in the 3rd study was the highest.

The analysis presented in *Tab. 2* shows that increasing age of men was not influencing the body mass index and similarly the affiliation of men to the particular birth cohort has not had an influence on BMI. On the contrary the differences between the periods of study had a significant influence on the increase of body mass index. The variance of BMI connected with the period of study certainly was not the consequence of the differences in the measurement procedure, because it was relatively simple and easy to keep in standard, so an influence of "study period" may only arise from an influence of many particular features, creating the characteristic of a certain period. An influence on BMI of several of these features, which were not appearing in models presented in *Tab. 2*, is presented in *Tab. 5*. In a multidimensional regression analysis, concerning actual caloric values of the diet we observed that increasing caloric values of the diet significantly (p=0.03) influenced the body mass index.

As you can see in *Tab. 3*, the value of the body mass index was increasing significantly with an increase of amount of total

Figure 1. **Overweight and obesity among men during next 3 studies in 9-year observation period**

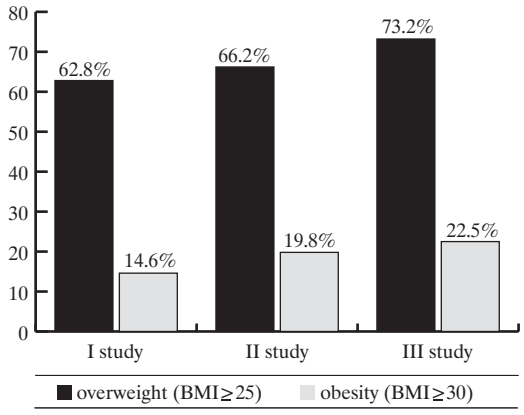

Table 3. **The influence of nutrients from the diet of men on body mass index. Linear regression analysis included age, period of study and cohort were included additionally**

Dependent variable		Independent variables	Age Δ=1.0 year	Differences between periods I-II	Differences between periods I-III	Differences between periods A-B	Differences between periods A-C	Animal protein Δ=1.0g	Plant protein Δ=1.0g	Animal fat Δ=1.0g	Plant fat Δ=1.0g	Total carbohydrates Δ=1.0g	Pure alcohol Δ=1.0g
BMI	Model No. 1	Δ	0.01	0.56	1.126	-0.49	-1.00	0.0003	-0.006	0.01	-0.002	0.002	0.006
		p	0.85	0.02*	0.01*	0.47	0.36	0.92	0.39	0.41	0.57	0.05*	0.46
	Model No. 2	Δ	0.01	0.53	1.21	-0.49	-0.97					0.001	
		p	0.85	0.02*	0.02*	0.48	0.38					0.03*	

* statistically significant variable

Table 4. **The influence of nutrients of the diet of men on body mass index. Linear regression analysis included age, period of study and cohort were included additionally**

Dependent variable		Independent variables	Age Δ=1.0 year	Differences between periods I-II	Differences between periods I-III	Differences between cohorts A-B	Differences between cohorts A-C	Animal protein Δ=1.0g	Plant protein Δ=1.0g	Animal fat Δ=1.0g	Plant fat Δ=1.0g	Carbohydrates without saccharosis Δ=1.0g	Saccharosis Δ=1.0g	Pure alcohol Δ=1.0g
BMI	Model No. 1	Δ	0.01	0.56	1.26	-0.48	-1.00	0.0002	-0.007	0.001	-0.002	0.002	0.001	0.006
		p	0.85	0.02*	0.01*	0.47	0.36	0.93	0.49	0.41	0.57	0.25	0.17	0.45
	Model No. 2	Δ	0.01	0.55	1.24	-0.48	-0.96			0.002			0.002	
		p	0.85	0.02*	0.01*	0.49	0.38			0.11			0.10	
	Model No. 3	Δ	0.06	0.54	1.23	-0.51	-1.03						0.002	
		p	0.91	0.02	0.01*	0.46	0.36						0.06	

* statistically significant variable

carbohydrates consumed by men. Explaining, whether saccharides with differentiate structure influence the body mass index to the same extent we excluded disaccharide saccharosis (sugar) from the group "total carbohydrates", and remaining saccharides were called "carbohydrates without saccharosis". Performed regression analysis, including the differences between the structure of the saccharides (*Tab. 4*), revealed in a model using elimination of the variables with step-by-step method (in model no. 3 variables remained with the value of p=0.06) that the body mass index may be influenced mainly by saccharosis (sugar) and other saccharides (saccharides without saccharosis) may not. The presuming mood arises from the value of p=0.06.

Among analysed sociological, economic and psychological factors only shift work caused an increase of the body mass index, while smoking significantly decreased its value – *Tab. 5*.

Discussion

Based on conducted research of body mass index changes in men we can ascertain that the nourishment of examined men in the years 1987-98 was improper. The evaluation showed overweight in 63-73% of examined men and obesity in 15-23% with the tendency to increase of those two states during 9 years of observation. Therefore feeding of examined men, in an observed period of time, did not act as it basically should, because it was providing too much calories according to body needs.

Observed values of BMI in examined men are comparable with the data collected in other studies in the last two decades, conducted in Poland. Szponar [8] examining men hired in big industrial work in the years 1991-94, observed overweight in 59% of men and obesity in 11% of men. On the contrary, in Pol-MONICA study (conducted in 1993) overweight was observed in 68% and obesity alone in 22% of men aged 35-64 years old, inhabitants of Warsaw [9]. Among men, inhabitants of a large Łódź agglomeration and small town area next to it, overweight was observed in 52-58% of examined [10].

The analysis of influence of nutrients in the diet of examined men on the value of their BMI shows that we can only say about an influence of an amount of total carbohydrates consumed, eventually including saccharosis, on BMI. Therefore the more total carbohydrates were consumed by men, including saccharosis, the greater values of BMI were observed in these men and contrariwise. The influence of feeding on health and the age of

Table 5. **Social, economic and psychological determinants of body mass index of 556 men, examined 3 times in the years 1987-1998. Linear regression analysis included age, period of study and cohort were included additionally**

Dependent variable / Independent variables		BMI (kg/m²)			
		Model No. 1		Model No. 2	
		Δ	p	Δ	p
Age (Δ=1.0 year)		0.004	0.94	0.01	0.85
Differences between periods	I-II	0.46	0.06	0.50	0.03*
	I-III	1.02	0.05*	1.18	0.02*
Differences between cohorts	A-B	-0.14	0.84	-0.20	0.76
	A-C	-0.70	0.52	-0.82	0.45
Physical activity according to FAO/WHO (Δ=1.0)		-0.39	0.55		
Character of work (physical/intellectual)		-0.31	0.42		
Education (elementary/secondary, university)		-0.05	0.89		
Shift work (one shift/more shifts)		0.47	0.04*	0.52	0.02*
Health status (healthy/ill)		0.14	0.42		
Marital status (single/married)		0.50	0.19		
Number of people in a family (Δ=1.0)		-0.14	0.22		
Income per person in a family (Δ=1000 PLN)		0.02	0.18		
Smoking (no/yes)		-0.62	0.003*	-0.62	0.003*
Leisure time (passive/active)		-0.14	0.68		
Skilled to evaluate own consumption (no/yes)		-0.03	0.82		
Behaviour model A – subscales (Δ=1.0)	the need of achievements	0.01	0.55		
	domination tendency	0.04	0.20		
	aggressiveness	-0.004	0.85		
	behaviour dynamics	-0.02	0.37		
	hurry and impatience	-0.002	0.93		

* statistically significant variable

survival was showed in the experimental studies on animals, who received fewer saccharides, mainly saccharosis, what was significantly slowing down the biological process of aging and elongated life [11,12].

The comparison of BMI with caloric value of the diet required additional including of several factors. Simple set of trends of those two features could lead to false results, especially in a prospective study. Prentice [13], presenting trends concerning with the frequency of obesity occurrence and the energy value of the diet in the years 1950-90 in England, showed the need of consideration of environmental and interpersonal determinants, and especially the lifestyle. Otherwise we may observe that both energy value of the diet and the amount of consumed fat does not relate to an increase of obesity occurrence. These factors influencing BMI may arise from the environmental conditions and lifestyle elements, for example: working in management, regular physical activity, driving a car instead of walking, leisure time connected with watching television for many hours [13-16], which problems were not identified as detailed in own study, but which are believed to cause an increase of obesity in England [13] and in United States of America [15]. In our own study, when age, environmental factors connected with the period of study and the affiliation to the particular birth cohort were included in multidimensional analysis of the connection between BMI and the caloric value of the diet, we then observed significant influence of the caloric value of the diet on BMI, that is with decreasing caloric value of the diet the BMI value was also decreasing.

The change of shift work into one shift work in examined group of men caused the decrease of BMI value, probably because of elimination of many physiological abnormalities in daily rhythms, arising during night work. Shift work was connected with long pauses between meals and lower number of meals eaten and it was accompanied by significant increase of obesity [17]. Much higher concentration of insulin is observed after meals with such feeding habits and it may also lead to the development of diabetes mellitus [18].

Non-smoking or breaking the habit of smoking caused higher BMI values in examined men in comparison to smoking ones. Other researchers also showed greater values of body weight measurements, body fat weight, BMI or higher frequency of obesity occurrence in non-smoking men in comparison to smoking ones [17,19-22]. In American studies on a group of 7000 men, there were less men with overweight among smoking – 52,8% than among non-smokers who never started smoking – 63,3% [21]. Also in Pol-MONICA study, the study of 2600 men showed lower content of body fat weight in active smokers in comparison to non-smokers and ex-smokers [20]. The influence of cigarette smoking on the decrease of body weight or body fat weight is connected by authors with an increase of total metabolism, preceded by activation by nicotine of sympathic system, what leads, as Hofsteter [23] showed, just after one day of cigarette smoking total metabolism was increasing by about 10%, with an increase of noradrenalin secretion with the urine at the same time.

Conclusions

- Body mass index in the group of 556 men improved significantly after 9 years of study from 26.2 kg/m^2 to 27.6 kg/m^2.
- In examined group of men the percent of people with overweight (BMI≥25) increased after 9 years from 62.8% to 73.2% and the percent of obese men (BMI≥30) increased from 14.6% to 22.5%.
- Among evaluated psychological, social and economic factors we showed that cigarette smoking influenced the decrease of body mass index, while shift work was increasing its value.
- The evaluation of the influence of diet on the body mass index shows that increasing caloric value of the diet and increased consumption of total carbohydrates caused significant increase of that index. Considering two subclasses within consumed carbohydrates, saccharosis consumption itself caused more significant increase of the body mass index than other carbohydrates.
- Resolving the obesity problem in an individual and social dimension requires using behaviour therapy, including health behaviour holistically, with the behaviour connected with nutrition in prevention of contemporary diseases.

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Common knowledge of leukemia among the youth and their attitude to the diagnosed disease

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Abstract

Purpose: **The aim of the study is to evaluate common knowledge shared by leukemia patients aged 12-18 yrs and to determine their attitude to the diagnosed disease.**

Material and method: **The study group consisted 30 of youth aged 12-18 yrs with diagnosed leukemia, which expressed agreement on participation in investigation. The study employed an own questionnaire entitled: "Common Knowledge of Leukemia among Youth and Their Attitudes to the Diagnosed Disease".**

Results: **Results passed of investigations one surrendered to analysis and one introduced inform of diagrams. Talked over results of investigations summed up are discussion and conclusions. Discussion achieves results of own investigations to these passed by Binnbesela's and of relating current knowledge about new-coined word disease among young people from 12 to 18 year of life, contains also considerations relating situation in which one is found young people with recognized leukemia.**

Conclusions: **The level of knowledge about leukemia in 12-18-year-old patients is highest in 18-year-old respondents. There is no dependence between the time lapse from the moment of diagnosis and the increase of knowledge on the subject. The attitude of young leukemia patients to their own disease does not change with the time lapse from the moment of diagnosis.**

Key words: leukemia, neoplastic, chemotherapy, radiotherapy.

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Introduction

Leukemias are the most frequent neoplastic diseases that occur in children and youth. According to the literature on the subject, they constitute 30-35% of all neoplastic cases in the age group 0-19 yrs [1]. It is generally known that people are not really interested in problems that do not concern them. However, when the disease occurs among their closest family members, they look for information on the subject. Common knowledge about neoplasms is usually limited to unverified facts, overheard relations and strongly negative emotions connected with the conviction that every cancer-stricken person must die [2,3]. Hence, we can conclude that the Polish society has got little knowledge of neoplastic diseases. Basing on this knowledge, they create their own attitude to the disease and pass it on to other people. It is particularly important for children and youth who, having already got minimum knowledge of human body functions, use it to account for the causes and effects of the disease.

The diagnosis of the disease scares a young person and makes him or her think about its causes and effects, and finally about the end of life. Young patients often actively participate in treatment, want to control the situation and try to get as much information as possible to be able to cope with the treatment effects. They also expect support and understanding from both, the medical staff and their parents.

Aim of the study The aim of the study is to evaluate common knowledge shared by leukemia patients aged 12-18 yrs and to determine their attitude to the diagnosed disease.

It was assumed that the following questions would be answered by our respondents:

1. Does the lapse of time from the disease diagnosis influence the amount of knowledge about the very disease?
2. Do the age and place of living of a patent increase the interest in the disease?
3. Does the attitude of a leukemia patient change with the time that has passed since the diagnosis?

Figure 1. **Age of a child at the time of diagnosis**

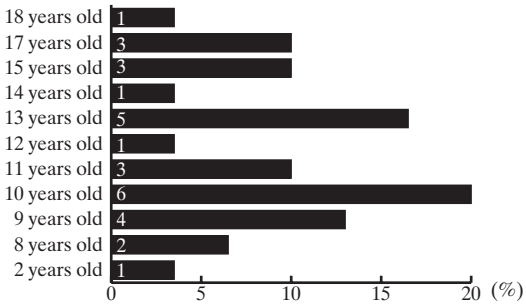


Figure 2. **Types of leukemia diagnosed in the examined youth**

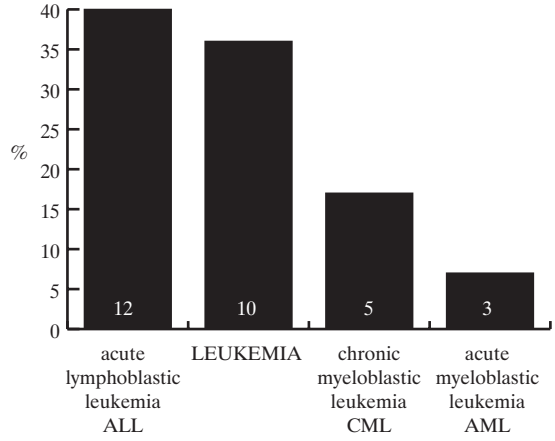
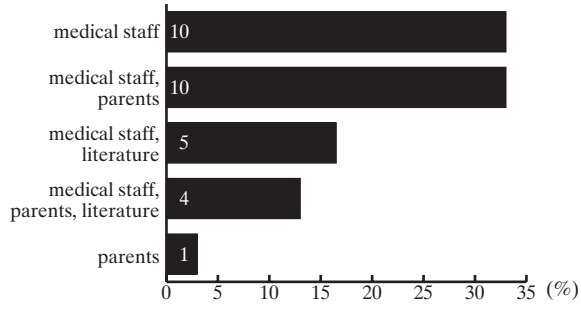


Figure 3. **The source of knowledge about the disease**



Material and methods

The study involved leukemia patients treated in the Chair and Department of Pediatric Hematology and Oncology in Bydgoszcz and in A. Jurasz Outpatient Department of Pediatric Hematology and Oncology in Bydgoszcz. The study group consisted of youth aged 12-18 yrs; 51% of girls and 49% of boys. Patients aged 12-15 yrs constituted 67% of the subjects, and patients aged 16-18 yrs constituted 33%. There were 67% of patients from towns and 33% of patients from villages.

The patients under study were informed about the study aim, their voluntary participation and its anonymity.

The study employed an own questionnaire entitled: "Common Knowledge of Leukemia among Youth and Their Attitudes to the Diagnosed Disease". The questionnaire was made up of three parts. The first one dealt with social-demographic data such as age, sex and place of living. The second part focused on the lapse of time from the moment of diagnosis, the type of disease and the knowledge of the disease. The last part dealt with the attitudes young people represent towards themselves and other patients with leukemia.

The questionnaire was filled in by the youth that met the following criteria:

– age 12-18 years of age
– diagnosed leukemia
– their consent to take part in the study.

Results

Young patients were divided into two groups, i.e. 12-14 and 15-18 years of age, taking into consideration possible differences in their intellectual-emotional development level which is connected with the ease of acquiring knowledge about their disease. The 12-14 yrs patient group consisted of 16 subjects (53%) – 7 (23%) girls and 9 (30%) boys. There were 14 (47%) subjects in the 16-18 yrs age group – 9 (30%) girls and 5 (17%) boys. There were 20 (67%) children from towns and 10 (33%) from villages.

The analysis of the collected data showed that the highest number of respondents had the leukemia diagnosis when they were 10 years old 6 (20%). This diagnosis was made at the age of 13 in 5 (16.7%) children and 4 (13%) were diagnosed when they were 9. There were three cases of leukemia diagnosed at the age of 17, 15 and 11 (10%) and in two (6%) children it was diagnosed when they were 8 years old. In 4 (13.3%) cases, the diagnosis was made when the patients were 18, 14, and 12 years old (*Fig. 1*).

Out of 30 youth under study, 12 (40%) had acute lymphoblastic leukemia (ALL). A marked group of patients – 10 (36%) did not give any answer as, particularly in the age group 12-14 they did not know the leukemia type they suffered from. They knew the general diagnosis but not the type. It resulted in non-marking the type of leukemia in the questionnaire. In 5 (17%) cases, it was chronic myeloblastic leukemia (CML), and in 3 (7%) – acute myeloblastic leukemia (AML) (*Fig. 2*).

In majority, the young patients marked medical staff or medical staff and parents – 10 cases each (33% each) as the source of information about the disease. There was only one person (3.3%) who obtained this information from the parents (*Fig. 3*).

The analysis concerning the knowledge of the youth as to what the disease really is showed that 27 (90%) of respondents described it as a proliferation of leukocytes (white blood cells) of one type in the human organism. None of them pointed at proliferation of red blood cells which proves they have got good knowledge of the disease. Only 3 (10%) patients marked the answer which was atrophy of leukocytes.

Figure 4. **The knowledge of chemotherapy purpose**

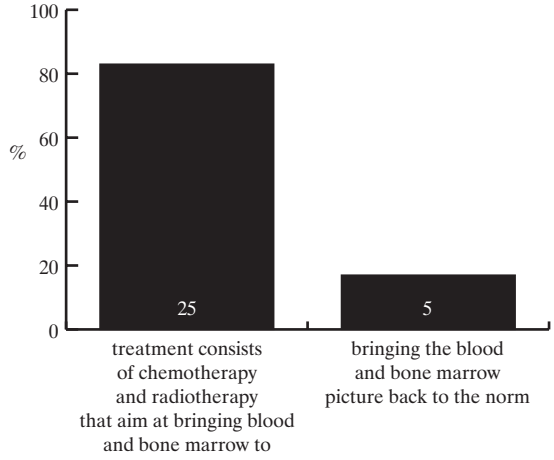
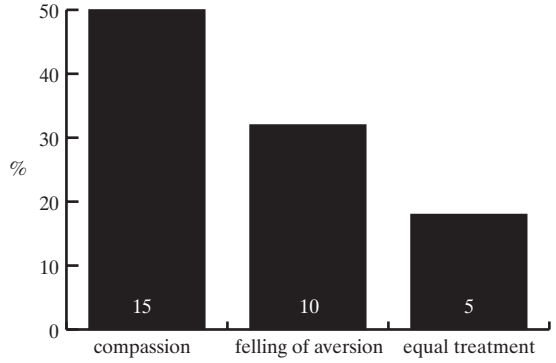


Figure 5. **Attitudes of the youth to other leukemia patients**



The respondents have good orientation about the causes of the disease they suffer from. 28 (93.4%) patients answered that the most important factors in the development of the disease were some viral infections, bone marrow damage caused by chemical substances (benzene), ionizing radiation or genetic factors. Only 1 (3.3%) child thinks that the disease is caused by the loss of a big amount of blood and diseases of unknown etiology.

The question about the most frequent initial symptoms was answered correctly by the majority of respondents – 24 (80%) who marked correct answers given by medical literature: pallor, dyspnea, weakness, susceptibility to infections, fever, lymph nodes swelling. It was very rare for them to mark the symptoms characteristic for leukemia and other diseases. It has been very important for the study that the young patients know and realize the purpose of anti-neoplastic treatment i.e. the application of chemotherapy in acute leukemic conditions.

The analysis of questionnaires shows that 25 (83.3%) of respondents know that the treatment of acute conditions consists in chemotherapy, mainly and its primary aim is to reach remission i.e. to bring the blood and bone marrow picture back to the norm and to reduce the number of neoplastic cells by at least 1 000 times. They have sufficient knowledge to understand that application of remission maintenance treatment is necessary. None of the respondents thinks that the aim of remission is to bring the blood and bone marrow picture back to normal without the change in the number of neoplastic cells. They also know that, beside chemotherapy and radiotherapy, there is also a possibility of bone marrow transplantation (*Fig. 4*).

All respondents say they fight and do not give in. During a casual conversation they all say they fight, do not give in do not feel pity for themselves and do not like pity or exaggerated emotions from their closest relatives.

The analysis of data on the attitude of the youth to other leukemia patients lets us state that about 50% of all respondents – leukemia sufferers feel compassion to the others suffering from the same disease. It is surprising, however, that 10 (33%) patients, males mostly, aged 12-15 feel aversion to patients that are in the same departments and suffer from the same disease. Only 5 respondents, when speaking about other leukemia patients, say that "they are exactly the same like us and should be treated identically, no matter if they are ill or not" (*Fig. 5*).

Discussion

Appropriate knowledge about neoplastic diseases causes the decrease of the fear level which is closely connected with emotional suffering. According to Chojnacka-Szawłowska [1] the knowledge of leukemias possessed by the Polish society can be described as common knowledge. Unverified facts are treated as information and they usually make people think that a cancer patient must die.

Available, although limited, literature [2,4] distinguishes three sources of common knowledge about diseases:

- own experience of a person providing fragmentary knowledge only, but it seems to be the most important source
- information, opinions and attitudes that come from actual sufferers and those who have contact with such patients or claim to have had it
- knowledge acquired from mass media.

Having talked to the examined youth, we can conclude that the most information about their disease comes from physicians and nurses who work in the department. The same amount of information is given to them by parents who learn it from medical staff and literature. Moreover, the young patients often get information from other patients who have the same kind of leukemia and stay together in the same department.

According to the studies by Świerczak-Bażańska et al. [5], 78.75% of youth suffering from a neoplasm have got sufficient knowledge of their disease.

The analysis of own research, particularly of the questionnaires' Part II, 57% of patients from the 12-18 age group have got good or very good knowledge of leukemia. The best knowledge is represented by the oldest participants of the study – those aged 18, irregardless of sex, place of living and time lapse from the moment of diagnosis. Boys aged 12-13 (57%) show the

lowest level of knowledge. They have got very little information about their disease. Taking into consideration the division into 12-14 and 15-18 age groups and their intellectual abilities, the study shows that 44% in the first group and 64% of respondents in the second group have satisfactory knowledge of leukemia. The remaining 56% from the 12-14 age group did not have even basic knowledge about the disease. It can be assumed that this lack of knowledge may result from the lack of interest in the disease, no access to information or the leukemia stage at the time of the study. It has been noticed that the amount of knowledge of leukemia among the youth with diagnosed leukemia is much bigger in older participants of the study.

Another factor analyzed statistically was the comparison of leukemia knowledge and the lapse of time from the moment of diagnosis. According to literature [1,2,6], the level of knowledge about the disease increases with the lapse of time from the diagnosis. Our study does not confirm this statement. The analysis of our results shows that in 10 (33%) cases of patients with the disease diagnosed 8-13 years ago, the knowledge about leukemia is lower than in the remaining 20 (67%) respondents. The answers given by these patients may not reflect the actual knowledge about the disease. Having observed them and talked to them, one can say they already feel tired by the whole situation, i.e. by continuous hospital stays, diagnostics and the very treatment the started to dominate their lives. They are not really willing to talk about the disease and become nervous when this subject is brought up. They are keen on talking about any other subject of interest to them.

The attitude of leukemia patients to the disease itself is a very important element of the therapeutic-nursing process. Hence, the answer to the question "does this attitude change and when" was looked for. It turns out that the study results are unequivocal. All respondents fight with the disease and do not give in. The respondents do have breakdowns, go through very difficult moments, and sometimes are fed up with it. Such situations take place in the moments that take them aback. Here, they most often speak about adverse effects of the first chemotherapy such as changes in appearance, constant nausea, vomiting, or chronic mucous membrane inflammation. As they say, they were aware of chemotherapy side effects, but there is a difference about knowing about them and actually going through them. The attitudes of leukemia patients that can be described as hope, fight and not giving in are not dependant on anything at all. Sex, age, and place of living or the time lapse from the moment of diagnosis does not affect these attitudes. Their fight with leukemia is surely supported by those who consciously or unconsciously do not let them give in.

Carrying out a survey with the application of own questionnaire has allowed to evaluate the level of knowledge and types of attitudes to the disease among leukemia patients who are aged 12 to18 years.

Each disease, particularly a neoplastic one, ruins the external and internal order in the life of every human being. Everything must be subordinated to many hospital stays and treatment cycles. The youth suffering from leukemia go through experiences they have not known so far, experiences they neither understand nor they want to understand.

Conclusions

The analysis of the collected material has let formulate the following conclusions:

1. The level of knowledge about leukemia in 12-18-year-old patients is highest in 18-year-old respondents;
2. There is no dependence between the time lapse from the moment of diagnosis and the increase of knowledge on the subject;
3. The attitude of young leukemia patients to their own disease does not change with the time lapse from the moment of diagnosis.

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Nurses′ attitudes towards transplantology

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Abstract

This paper is an attempt to examine nurses' attitudes towards transplantology, a branch of clinical medicine responsible for organ transplants. 84 registered nurses were interviewed. The questionnaire was of an audit character and it was filled under the supervision of interviewers. Nurses' knowledge about issues concerning transplantology was very incomplete. Very few nurses had their own experience in being a tissue donor (blood, bone marrow) for another human being. Many participants didn't see any difference between diagnosed death of brain stem and being a potential donor. Transplantology issues are still a taboo in many families. The majority of nurses involved in the study, thought they could be a donor ex mortuo. As an ex vivo donor, participants would agree to give their bone marrow. 9.5% of interviewed nurses didn't see anything wrong in buying organs.

Key words: nurses, transplantology, donor.

Introduction

Last year, the 50th anniversary of the first successful human kidney transplantation was celebrated. December 1954, when Joe Murray performed first successful transplant of a twin kidney, is perceived to be the beginning of the human organs transplantology era [1]. This year, it will be 40 years since Prof. Jan Nielubowicz, together with his team, transplanted a kidney taken from a dead person for the first time in Warsaw. A student nurse was the organ recipient [2]. "Alexis Carrel, who between 1900 and 1920 dreamt the dream (…) of surgical exchange of fatally sick organs into healthy ones, is considered the father of the transplantation idea" [3].

The second part of 20th century has been called transplantology times because of the sudden development of this branch of medicine. Currently, transplantology is a branch of clinical medicine. As a science it considers problems of cells, tissues and organ transplants.

An extreme failure of a particular organ, tissue defect, organ defect or they absence are the reasons leading doctors to perform that kind of surgery. About 1 million people with a transplanted organ are living around the world nowadays [1].

A term of transplant comes from the word *transplantare*, describing an activity of transplanting or moving. It is a surgical intervention of cell, tissue and organ transplantation from donor into recipient organism performed in therapeutic purposes. When a criterion of donor vital state is taken into consideration, two kinds of transplants can be distinguished: *ex mortuo* – transplanted organ comes from a dead person, *ex vivo* – transplanted organ comes from a living donor [1].

There are many reasons why transplants of organs taken from living donors – patient's relatives amount to 3-4% of all transplanting interventions in Poland. Of 1279 organs taken from donors in 2002, only 38 came from living donors. The conclusion arises that lives of huge number of patients depends on post-mortem donation [4].

Medical practise shows that benefits can be derived from the whole human body, and transplantologists underline that from a technical point of view, any organ can be transplanted [1].

Fast development of transplantology forced an act introducing precise and comprehensive regulations concerning issues of taking and transplanting organs. On 26th October 1995, The Polish Parliament passed an act about taking and transplanting cells, tissues and organs. Regulations included in that act,

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together with 10 other executive acts, came into force in March 1996. The regulations concern *ex mortuo* and *ex vivo* transplants and they are based on nine leading rules of transplantology: (1) legality of collecting organs from dead people, (2) objective diagnosis of potential donor's death, (3) preferring *ex mortuo* transplantations, (4) donor must be of age, (5) organ's trade is forbidden, (6) no announcements of payment for transplantation are allowed, (7) honesty of medical personnel, (8) due salary and (9) primacy of health needs. [5]

Although transplants become more prevalent in medical practise and develop continuously, they are not free from problems and questions. Despite the increase in number of performed transplants, the group of patients, waiting for organ or tissue, grows all the time. The supply of organs never satisfies demand for them. Therefore, problems concerning distribution of donated organs taken from human corpses, and the question of choosing the right recipient, emerge [1].

Organ transplantation is a very specific form of treatment. Apart from a patient and medical staff, an organ, taken from dead or living donor, is necessary. The biggest group of donors consists of young people, usually tragically killed in transport accidents or victims of other sudden death – e.g. suicides. A form "potential donor" describes a person, after whose death there is a theoretical possibility of taking his/her organs [2].

The Catholic Church position, which is definitely positive in the matter of organ transplants, is very important in forming social attitudes of Catholics towards transplantations. The moral authority of The Catholic Church – John Paul II, supports the idea of transplantology [7]. The Church approves transplantations but not unconditionally.

The most significant conditions, under which The Church allows *ex mortuo* organ explantations, concern donor's death and consent expressed by the donor himself. As far as the first condition is concerned, The Church accepts medical criteria of death and approves the idea of brain death. The donor's consent is the second ethical condition of organ explantations after donor's death. Christian ethical norms point to the need of conscious consent of a future donor for taking his/her organs, or acceptance given by statutory representative [7,8].

The number of dialysis increases, but still 3000 people suffering from chronic renal failure die every year in Poland. Situation of people waiting for heart or liver transplantations is much worse. In their cases there are no "substitute organ" therapy. The only rescue for those patients is transplant intervention. More than half of patients waiting for transplants die before desired surgery is performed, for the number of taken organs are not sufficient [2].

Transplant medicine, as no other medical speciality, is connected with many extremely difficult problems. One of them concerns still present difficulties resulting from complicated immunology processes. The success depends on immunological reaction of recipient's organism to new cells, tissues or organs. Transplantologists are still meeting moral barriers, which except general and social aspect, also seem to be present in medical environment. Moreover, transplantology centres experience more financial problems all the time [2].

Currently, in Poland 1771 patients await vascularized organ transplants. Meanwhile, the list of potential patients, registered on the national List of Poltransplant Recipients, includes: 1473 kidney, 20 kidney and pancreas, 113 liver, 148 heart and 17 heart and lung recipients [6].

There is no doubt that organ transplants are modern, needed and effective method of treatment in the case of irreversible renal failure.

The purpose of our study was to examine nurses' attitudes towards transplantology and use conclusions in nursing education process at Bachelor's degree level.

Material and methods

The study utilised diagnostic survey method based on a questionnaire. Eighty-eight registered nurses were interviewed. A method of diagnostic survey with questionnaire technique was used. A questionnaire including 38 items (open, half open and closed questions) was utilised as a measuring tool. The questionnaire of an auditory character was filled under the supervision of interviewers between 17 and 19th December 2004 by the group of students at The Podhale Public School of Higher Vocational Education in Nowy Targ.

Women were the majority of the sample (98.8%). Nurses between 31 and 35 years old comprised the biggest age group – 41.7% of all participants. That group consisted only of females. The age of male participants ranged from 36 to 40 (1.2% of the cohort) and 46-50 (1.2%).

The proportion of single participants to married ones was 1 to 3. The divorced and widows comprised 2.3% of all participants. The participants worked in the following departments: interventional – 32.1% (surgical, dialysis, emergency), conservative – 35.7% (internal, paediatric), care – 5.9% (care, Social Care Centres) and outpatient care – 17.8% (outpatient clinic, schools). The rest of the sample (8.3%) didn't answer the question. The majority of participants had worked for at least 10 years.

Results

Unfortunately, less than 55% of all participants knew the name of the institution coordinating organisational matters concerning transplants in Poland. All the male participants and 53.6% of female nurses comprised this group. The rest of female nurses didn't answer the question at all (15.8%) or gave a wrong name of The Centre of Transplantology (30.6%).

98.8% of interviewed nurses believed that heart and kidney transplants were possible. Smaller number of nurses (92.8%) said that liver transplantations were performed, and only 13.1% heard about pancreas transplants. The same number of participants said, spleen transplants were possible (*Fig. 1*).

When asked if they were donors of tissue or organs, 3.6% of all respondents said they were blood donors, and 1.2% donated bone marrow to other people. All the donors were female. This information is particularly interesting when the fact, that 29.8% stated they were honorary blood donors, is taken into consideration. 2/3rd of nurses who gave their blood weren't honorary blood donors, and they gave blood as a "respond to some kind

Figure 1. **Performed transplants according to the participants**

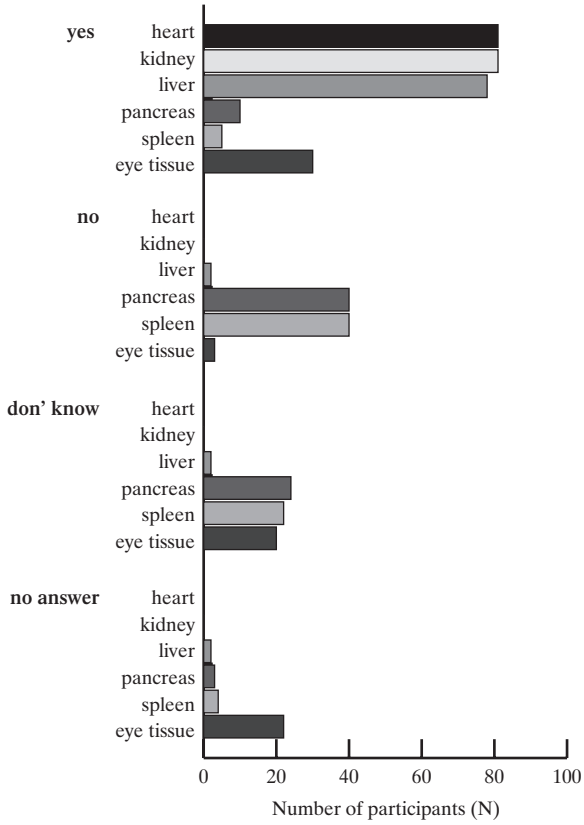
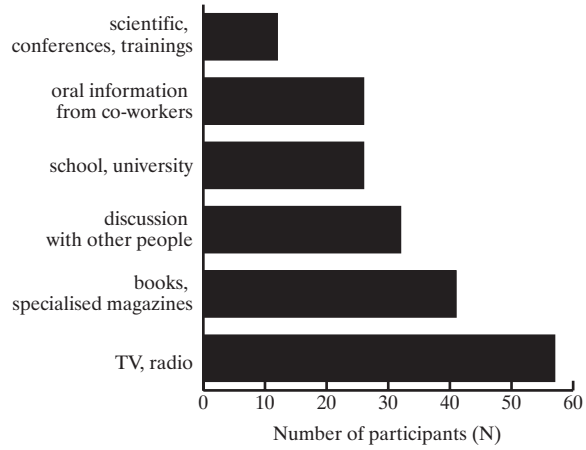


Figure 2. **Sources of knowledge concerning transplantations**



of action". 40.5% of all respondents claimed their relatives were honorary blood donors. The largest part of that group comprised of nurses' husbands (35.3%) and their parents (17.6%). 64% of nurses being an honorary blood donor, didn't give blood as a "respond to the call". The rest gave blood either as a respond to an organised action or to their relatives or strangers request. Only one person (1.2%) who wasn't an honorary blood donor gave blood as a respond to a request.

More than half of all respondents (54.8%) saw the most serious problem of current transplantology in "small number of donors", which meant, "lack of organs". The interviewed nurses perceived other problems like: "high costs of surgery" (27.4%), "small financial resources" (17.8%) and "protests of dead person relatives" linked to "small social consciousness" (23.8%) and lack of social education in that area (14.3%). 5.9% of all respondents admitted, they were not interested in problems of transplantology. Moreover, one person refused to be a post-mortem donor. In the group of nurses, who didn't care about transplantology problems, the relation of the number of respondents willing to become a donor after their death to those refusing to be a donor was 3:2.

A form "potential donor" describes a person, after whose death there is a theoretical possibility of taking his/her organs [2]. The respondents understood "potential donor" as: "every healthy man" (25%), "every person qualified as a donor" (20.2%), "every person from the street" (9.5%). 8.3% of nurses believed that a "young man, mainly after accident" is a potential donor. 7.1% of all participants paid attention to the question of lack of refusal, and half of that number thought about the aspect of brain stem death (3.6%). 12% of nurses participating in the study believes that "potential donor" must express his/her consent when he/she is alive, so he/she can be *ex mortuo* donor after death.

More than 58% of the respondents met, in their professional work, a person with diagnosed death of the brain stem. This information becomes significant in the light of previous statements of respondents, where only 32% of them said they met a potential donor in their professional work. Less than half of all nurses (48.8%), who had a contact with a patient with diagnosed death of the brain stem, linked that fact with potential organ donor. The biggest group of nurses, who saw a patient with dead brain stem, worked in the surgical departments. Also, not less than 40% of nurses working in the care centres and the surgical unit and the same number of nurses from outpatient clinics stated that they took care of a patient with diagnosed death of the brain stem.

59.5% of all respondents believed that The Catholic Church "supports", "allows", "doesn't oppose" organ transplantation, 2%, however, said that The Church supports this idea but under certain conditions, which they didn't name. 26.2% of participants didn't know what kind of attitude The Church presented, and according to the opinion of 7 nurses (8.3%) The Church was against transplantations.

The majority of all respondents thought that "buying organs" is reprehensible. Only 9.5% didn't see anything wrong in it, and 2.3% of the sample believed that "it will be always possible to buy anything". Only 4.7% of the respondents noticed the legal aspect of organ trade.

For 67.8% of all respondents, the television was the main source of information about issues concerning transplantology, meanwhile school or university were classified as no 4 on that list (*Fig. 2*).

Presumed consent is present in half of the European countries, and it is written in the resolution of The European Cabinet. The logic of this idea called presumed consent is based on the thesis that lack of refusal means acceptance of

organ donation from one's dead body. As far as legal aspect is concerned, no one, even the closest relatives cannot successfully forbid organ donation. However, ethical aspects and morality point to the need of informing the family about intended organ donation from the body of a dead close relative.

The vast majority of the respondents (92.8%) said they didn't express their refusal to organ donation from their bodies after death. However, most of them knew how one can formulate his/her refusal e.g. 30.8% pointed to The Central Register, more than 44% – written statement. 71.4% of all nurses expressed their will to be donors, however 1/3rd of that group agreed to be a donor only after their heart dies.

The act, being in use in Poland, clearly describes the ways of refusal (article 5). 17.8% of nurses knew about registration of refusals in The Central Register. The majority (54.8%) was aware of written form of refusal, 30.9% of nurses suggested a written information in the identity card, and 7.1% believes this information can be included in the last will.

13.1% of all nurses perceived the opinion of family as a form of refusal concerning taking organs after one's death.

Very often, it is the family of a dead person, who protest against organ donation although this person never expressed refusal. That's why family discussion about that matters is so important. 1/3rd of all nurses (38%) didn't talk about these problems with their families at all. 47.6% of the sample said they talked about transplants with their relatives rarely, 13% often. 71.4% of all participants who didn't discuss transplantology matters in their families (38% of all) expressed the will to become a donor after their death. Those who want to be donors believe their families know their will in 89.5%.

As many as 64.3% of all nurses, didn't know their closest relatives' will about consent for taking organs from them after their death.

More than the half of the respondents (53.6%) claimed their relatives knew their opinion about organ donation, but only 66.7% of that group discussed that question with their families, and the rest believed their families knew their will because they presume it.

When situation of death of a close relative was concerned, 45.2% of all nurses didn't know whether they would agree to take organs from the dead, and 16.7% would protest definitely. In that last group, 57.2% of the sample didn't know their relatives' will about organ donation after their death, and 42.8% claimed they had this knowledge, so they would act according to dead person's will. Surprisingly, those who weren't sure what kind of decision they would make, said in 23.7% of the cases they knew their relatives' will.

Transplanted organs come from the dead almost always. In the case of a twin organ like kidney or bone marrow, it is possible to take them from living donors. According to 95.2% of the nurses said that an *ex vivo* donor had to be healthy, 8.7% paid particular attention to the question of absence of neoplastic diseases, and 7.5% underlined negative results of the HIV and HBS tests. 21.4% underlined also the fact of donor's consent and 17.8% remembered about demanded biological consistency between the donor and recipient.

If there was such a need, 87.4% of all nurses were ready to give their kidney to one of their relatives, and 90.5% would agree to be a bone marrow donor for their relatives. In both cases none of the participants refused, the remaining ones answered, "I don't know". If a nurse was a kidney donor to a stranger, the majority of participants (58.3%) would say "don't know", the rest was equally divided into two groups – "yes" group (21.4%) and "no" group (20.2%). Being a bone marrow donor wasn't a problem for 55.9% of all respondents, and 11.9% of them said "no".

Discussion

Specialists believe that in Poland transplantology presents dynamic development, and creation of "Poltransplant", The Organisational-Coordinative Centre for Transplantology Matters, was the turning point in more prevalent use of transplantology [4]. Surprisingly only half of the nurse respondents, working in health care, knew the name of this institution.

The following organs are transplanted in Poland: kidney, heart, liver, pancreas, and lungs. It is possible to transplant several organs at the same time (multi-organ transplants) e.g. heart with lungs or kidney with pancreas [1]. It is interesting that 13.1% of all participants thought that spleen transplants were performed.

There is no doubt that elements like: participants' experiences or his/her relatives' experiences concerning tissue or organ donation for another man, influence one's opinion. 95% of examined population didn't have any personal experiences in this area. Only 4,8% of all respondents said they were blood donors or bone marrow to other people.

Transplantology is connected with many problems concerning the following elements: immunosupression, distribution of treatment "possibilities" (choice of recipient), ethics, morality, law and finances. Surprisingly, none of nurse respondents paid attention to medical aspects of transplants concerning immunosupression.

The transplantology act, being in use in Poland, regulates, according to the European standards, the issues concerning transplants of tissue and organs taken from both: living and dead donors. The conditions of taking organs from dead people are based on the idea of presumed consent. Everyone has the right to express refusal, and if the possibility of taking organs from him/her is problematic, one will think about it when he/she is alive [5]. 12% of participants revealed complete lack of knowledge about law acts, who said that potential donors had to express the consent when they were alive.

Despite legal "presumed consent", 13.1% of respondent confirmed that in Polish reality the decision about taking organs from a dead person stays in his family hands. As many as 64.3% of all nurses, didn't know their closest relatives' will about consent for taking organs from them after their death. It seems to be quite interesting, since 60.7% of participants claimed they discuss topics concerning transplantations, so 3.6% touched on those issues but not when the question of learning their relatives' will was concerned.

The act, being in use in Poland, clearly describes the ways of refusal (article 5): through the registration in The Central Register, written statement signed personally and verbal state-

ment expressed in the presence of two witnesses at least when a patient is admitted to hospital or stays there [5]. Respondents showed little knowledge about possible forms of refusing to become *ex mortuo* donor. 7.1% of all respondents thought that the last will might have been a way of expressing refusal, which shows complete misunderstanding of the transplantation idea.

If a potential donor didn't express the refusal when he/she was alive, entire procedure is commenced with all its demands. The first step is to diagnose the death. Since the respirator had been invented, a new definition of death had to be formulated. Before that a classical definition was in use. The lack of heart and lungs activity was understood as the end of human life. Brain death concerns its stem, which is responsible for processes like: breathing, heart action, and blood circulation. Consciousness and biographical memory, which are placed in upper parts of the brain, die earlier. Therefore, the brain stem death means human being death as integrity, although some parts may still be alive (e.g. organs) [2,5]. Nurses didn't relate brain stem death with a potential donor, which is an undoubtful evidence of ignorance in the field of transplantology.

Shortages in donated organs caused that paid and rewarded donors appeared. The world's population is divided into poor and rich. Therefore, there is a danger that people from poor countries will sell their and their children's organs in order to avoid poverty. Polish transplantology act unambiguously forbids accepting any financial rewards for taken cells, tissues and organs (article 18). There is also a penalty of 3 years of imprisonment and even 10 years for organ trade [5]. Vast majority of participants said that "organ trade" is blameworthy, but only 4.7% paid attention to legal aspects of this procedure. There fore, we can assume that others considered moral aspect as the most important.

In Poland no transplants of organs taken from paid donors are performed. Medical environments, parliaments of many countries, the World Health Organisation and the European Council condemned commercialisation and organ trade and passed the Bioethical Convention in 1996. Articles, with sensational titles, concerning organ thefts, more frequent nowadays, make people lose their trust and suspect the doctors responsible for transplants, and finally complicate making decisions about approval or refusal to take organs from a donor after his/her death. The Press, radio, but most of all TV often present problems of a single person in too emotional way (while not concerning social problems). However, emotions can easily lead to carelessness [2]. For 67.8% of all respondents, the television was the main source of information about issues concerning transplantology. For a professional group like nurses, TV shouldn't be the main source of information.

Conclusions

The examined nurses possessed incomplete knowledge concerning medical and legal aspects of transplantology. Few nurses have their own experience as a blood or bone marrow donor to another person. Topics concerning transplantology are taboo in many families. The majority of the respondents claimed they could be donors *ex mortuo*. TV was the basic source of information about topics concerning transplantology for the examined nurses.

Education is of a great importance in promoting the conviction that acceptance of transplantology matters to all people. Each one of us and of our families not only can be a potential donor but also a recipient.

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Concentration and microheterogeneity of acute-phase glycoproteins in patients with Systemic Lupus Erythematosus

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Abstract

Purpose: To determinate glycosylation of selected acute-phase glycoproteins (AGP, ACT, CP) and serum concentration of this proteins in Systemic Lupus Erythematosus (SLE) patients.

Patients and methods: The study was carried out on 35 patients with active SLE and 15 healthy volunteers. The immunological measurements were performed at first day of hospitalisation, before receiving treatment. The concentration of CRP, AGP, ACT and CP were evaluated by electroimmunoassay using anti-AGP, anti-ACT, anti-CP antibodies. CRP levels were determined by radial immunodiffusion with anti-CRP antibodies. The microheterogeneity of the acute phase proteins was assessed by agarose affinity electrophoresis using Con A as a ligand, as was described by Bøg-Hansen.

Results: Between SLE patients and control group statistically significant differences ($p<0.01$) were observed in serum concentration of all investigated parameters. There were no significant differences in serum acute-phase proteins levels with regards to patient's age, sex and disease activity. The reactivity coefficients: AGP-RC, ACT-RC, CP-RC in SLE patients were similar to the healthy group. The precipitate curves were similar in both groups. The main difference was in the area of the precipitant, which was bigger in the SLE patients.

Conclusions: Configuration of analysis serum concentration and heterogeneity of acute-phase proteins is one of important diagnostic tests in SLE.

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Key words: Systemic Lupus Erythematosus, acute-phase proteins, heterogeneity, glycosylation.

Abbreviations: SLE – Systemic Lupus Erythemetosus, APP – acute-phase proteins, AGP – α1-acid glycoproteins, ACT – antichymotripsin, CP – ceruloplasmin, CRP – C-reactive protein, RC – reactivity coefficient, Con A – concanavalin A, IL-interleukin.

Introduction

The concentration and microheterogeneity of acute-phase proteins (APP) differs in acute and chronic types of inflammation [1,2]. The qualitative changes of some acute-phase glycoproteins are referred as a major microheterogeneity. Affinity electrophoresis with a lectin, concanavalin A (Con A) as a ligand has been successfully used to determine acute-phase glycoproteins microheterogeneity. The concentration and microheterogeneity of acute-phase proteins can be used in early diagnosis, management and prognosis of chronic inflammatory stages.

Systemic Lupus Erythematosus (SLE) is a chronic autoimmunological inflammation and is the most clinically and serologically diverse of the autoimmune connective tissue diseases; it may affects any organ of the body and displays a broad spectrum of clinical and immunological manifestations. In other chronic inflammatory disease, like in rheumatoid arthritis, ancylosing spondylitis, polymyalgia rheumatica and Crohn's disease a significantly decreased proportion of acute phase proteins reacting with Con A were observed.

In the present study, we evaluated the determination of concentration and microheterogeneity of α1-acid glycoprotein (AGP), antichymtripsin (ACT), ceruloplasmin (CP) and C-reactive protein (CRP) in early diagnosing of SLE. In order to get a better insight into acute-phase proteins network regulation in Systemic Lupus Erythematosus, we analysed levels of this proteins in the sera from 35 SLE patients.

Table 1. **Characteristics of SLE patients**

Patients number	35	
Sex (M:F)	3:32	
Median age in years (range)	34.7 (21–50)	
Median duration of disease in years (range)	6.9 (0.5-28.0)	
Clinical manifestations	Arthritis	13
	Skin manifestation	20
	Serositis	7
	Fever	15
Positive antinuclear antibodies (ANA)	35	
Haematological symptoms	Anaemia	25
	Leukopenia	27
	Thrombocytopenia	17

Table 2. **Medium serum levels of acute phase proteins and medium reactivity coefficient in the SLE patients and healthy individuals**

	SLE patients	Healthy individuals
Median serum levels of AGP (ng/ml)	1234.0 (967.7-1615.7)*	623.7 (432.1-678.9)
RC-AGP	1.29 (0.976-1.361)	1.02 (0.876-1.298)
Median serum levels of ACT(ng/ml)	669.0 (578.0-781.0)*	221.6 (132.8-265.8)
RC- ACT	3.98 (3.12- 4.54)	4.25 (4.01-4.87)
Median serum levels of CP (ng/ml)	538.0 (481.0-589.0)*	267.7 (198.4-311.7)
RC- CP	1.298 (0.87-2.43)	1.4 (0.76-2.2)
Median serum levels of CRP (ng/ml)	21.7 (11.6-41.0)*	7.1 (2.9-13.5)

* p value statistically significant

Patients and methods

The study included 35 patients with active SLE. They had been hospitalised in The Department of Rheumatology and Internal Diseases, Medical University in Białystok from March 2001 to June 2003. All patients fulfilled The American Rheumatism Association revised criteria for classification of SLE [3]. The activity of the SLE was graded at the time of blood sampling, based on SLEDAI criteria [4]. The clinical profile of the patients is presented in the *Tab. 1*.

The control group consisted of 15 healthy individuals (4 males, 11 females) with mean age of 42.3 years. There were no significant differences in age and sex between the patients and the controls.

Serum AGP, ACT, CP levels were measured by electroimmunoassay using anti-AGP, anti-ACT, anti-CP antibodies [5]. CRP levels were determined by radial immunodiffusion with anti-CRP antibodies.

The microheterogeneity of the acute-phase proteins was assessed by agarose affinity electrophoresis using Con A as a ligand, as was described by Bøg-Hansen [6]. 50 μM Con A was included in the first dimension gel. Electrophoresis was carried out for 60-70 minutes, at 20 V/cm. Two gel adjacent of the first dimension gel, one containing specific antibodies, and the other containing methyl-mannosid, were cast. Electrophoresis of second dimension was carried out for 18 hours at 1.5 V/cm. The gel was dried and stained by Commasie brillant blue. This method reveals 4 microheterogeneous variants of AGP, ACT and CP. Variant 0 is nonreactive with ConA, variant 1st is slightly reactive, variant 2nd – strongly reactive, 3rd – very strongly reactive, often precipitated in the first dimension. The area under the precipitate curves was determinated planimetry and the reactivity coefficient (RC) was calculated according to formula:

$$RC = \frac{\text{Sum of Con reactive variants}}{\text{Sum of Con nonreactive variants}}$$

All blood samples were collected from each patient before receiving treatment. Serum samples were stored at -80°C until assayed.

Statystical analysis

Data were presented as mean ± 1 SD or median (range), depending on distribution provided by Shapiro test. Data for concentration in serum acute-phase proteins from healthy individuals and patients with SLE were analysed using Student's T-test. In the case of skeweew distribution we used Mann-Whitney's test. Differences between group were regarded as statistically significant at $p<0.05$.

Results

α1-acid glycoprotein (AGP)

Serum levels of AGP in SLE patients with are shown in *Tab. 2*. AGP level in all patients with SLE were very high and were significantly higher than in healthy population ($p<0.001$). There were no significant differences in serum AGP levels with regards to patients age, sex and disease activity ($p=0.52$). The median reactivity coefficient (AGP-RC) was 1.29 (1.361-0.9760). AGP-RC was similar like in healthy individuals ($p=0.321$). The precipitate curves were similar in both groups. The main difference was in the area of the precipitant, which was bigger in the SLE patients (*Fig. 1*).

Antichymotripsin (ACT)

The median levels of ACT in sera patients with SLE were 669.0 ng/ml (578.0-781.0 ng/ml) and were significantly higher compared with those in healthy individuals ($p<0.001$). There were no significant differences in serum AGP levels with regards to patients age, sex and disease activity ($p=0.312$).

The median reactivity coefficient (ACT-RC) in SLE patients was 3.98 (3.12-4.54) and was similar to ACT-RC in healthy group ($p=0.123$) (*Fig. 2*). The precipitate curves were similar in both groups. The main difference was in the area of the precipitant, which was bigger in the SLE patients. The picture was corresponded to the AGP curves.

Figure 1. **Affinity electrophoresis, using concanavalin A of AGP in the healthy group (1) and SLE patient (2)**

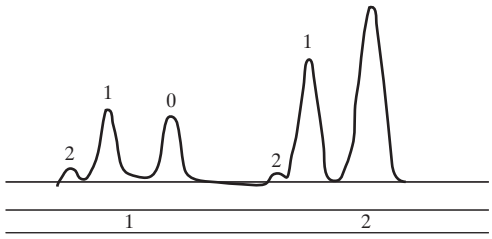
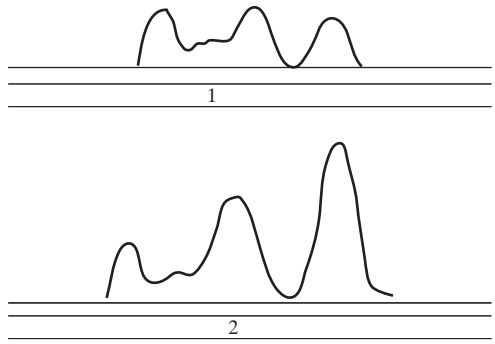


Figure 2. **Affinity electophoresis, using concanavalin A of ACT in the healthy group (1) and SLE patients (2)**



Ceruloplasmin (CP)

The median levels of CP in sera patients with SLE were 538.0 ng/ml (481.0-589.00 ng/ml). They were almost two times higher than in control group ($p<0.001$). There were no significant differences in serum CP levels with regards to patients age, sex and disease activity ($p=0.52$).

The median reactivity coefficient (CP-RC) in SLE patients was 1.298 (0.87-2.43) and was similar to CP-RC in healthy group ($p=0.123$). The precipitate curves were similar in both groups. The main difference was in the area of the precipitant, which was bigger in the SLE patients. The picture was corresponded to the AGP and ACT curves.

C-reactive protein

The median levels of CRP in sera patients with SLE were 21.7 ng/ml (11.6-41.0 ng/ml). It was almost three times higher than in control group ($p<0.001$).

Discussion

Values of concentrations of acute-phase protein and decrease values of reactivity coefficient were previously found in chronic inflammatory processes. This parameter can be also useful in diagnostic and management of SLE [7]. Changes observed in sera of SLE patients were similar to healthy individuals. Reactivity coefficients of AGP, ACT and CP were normal, compared with results using sera control group. SLE activity did not alter the reactivity with Con A in sera SLE patients. Although concentrations of AGP, ACT, CP increase significantly. There was one exception – C-reactive protein. Generally levels of serum CRP were normal or only slightly higher than in control group. All these above featured changes are very typical for SLE. Some authors suggested that elevated levels of CRP might serve as a marker for infection in SLE [8]. However, the usefulness of this measure has been controversy.

Therefore, it seems likely that the reactivity of proteins with Con A depends on regulatory mechanisms of inflammatory reaction than on the disease itself. Still unexplained is a lack of change and normal value of RC in active SLE. Unchanged glycosylation pattern in this disease may be explained by the very low stimulation of hepatic synthesis of proteins. The expression of this is very low C-reactive protein level. In the other hand levels of AGP, ACT, CP were very high. This observation suggests that glycosylation is differently regulated than synthesis of the acute-phase proteins. The main role in the regulatory process has probably cytokines.

Baumann suggested that there are two main groups of cytokines, which influence on synthesis and action of acute-phase proteins [10]. Type I cytokines (IL-1α, β and TNF-α) stimulate the synthesis of such proteins like CRP, Serum Amyloid A, AGP. Macrophages and monocytes release these cytokines. They can also decrease synthesis of other proteins like CP, ACT. Type II cytokines (interleukin-6, interleukin-11, leukemia inhibitory factor) stimulate the second group of acute-phase proteins, like fibrinogen, ACT, CP [11].

Quantification of the serum IL-10 level showed increased levels in SLE and RA patients as compared to healthy controls. Serum IL-6 level was found to be elevated in SLE patients. IL-10 has a potent immunosuppressive activity, IL-10 did not correlate with APP either in SLE patients. However, the elevation of IL-10 serum levels in SLE and the correlation between IL-10 and IL-6 in SLE may suggest that IL-10 may play a central role in regulation of synthesis acute-phase proteins [12].

It has been reported that the antibodies to modified CRP were present in some autoimmunological disease. These antibodies represent a novel group of autoantibodies, first described in one patient with SLE and later in patients suffering from toxic oil syndrome (TOS). The occurrence of antibodies to CRP and to other acute-phase proteins in a larger group of patients with SLE and other autoimmune diseases were demonstrated [13]. Patients with SLE have a high incidence of antibodies to acute-phase proteins, preferentially to CRP.

The diagnosis and management of SLE is still predominately based on clinical parameters. Nevertheless, specific laboratory diagnostic test may often be critically helpful. Configuration of analysis serum concentration and heterogeneity of acute-phase proteins is one of important diagnostic test in SLE.

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Information support concerning care of a baby provided for lying-in women during their stay in maternity ward in rooming-in system

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Abstract

The aim of the study was to estimate the need for information support concerned with care of a baby and evaluation of lying-in women expectations referred to sources of support, methods and devices used during presentation.

The research included 200 lying-in women hospitalized in Clinic of Obstetrics and Perinatology, Pomeranian Medical University in Szczecin; there were separated the study group which consisted of primiparas (n=100) and reference group – multiparas (n=100). The applied method was medical history of a patient, and a research tool was author's questionnaire.

The results show that primiparas noticeably more often than multiparas need information support related to care of umbilical stump ($p<0.001$), bathing ($p<0.001$), care of skin and mucous membranes ($p<0.001$), management of regurgitation, management of colic ($p<0.001$), signs of neonatal transient states, and checking for concern-raising signs ($p<0.001$).

Lying-in women much more often indicate a nurse/midwife and a doctor working in maternity ward as a source of information support, and considerably more often expect information to be provided in the form of training and chatty lecture with the use of brochures.

Conclusions:

1. Primiparas require greater involvement of health professionals in providing information support and especially giving information on baby care.

2. A nurse/midwife and a doctor are these people in maternity ward who are particularly expected to provide information support for both primiparas and multiparas.

3. Different methods (training, chatty lecture) may be applied when information support is provided and the choice should correspond with patients' needs, goals and organizational possibilities.

4. Lying-in women expect various devices used for providing information support, but in most cases they are brochures with information on particular topics.

Key words: information support, postnatal care, nursing a baby, rooming-in.

Introduction

After giving birth to a child a family and especially a woman expect protection and support from the close relatives as well as from the health service workers. Helena Sęk [1] defines social support as a kind of interaction which occurs in difficult or problematic situations. Its aim is to cause one or both participants of the interaction to get closer to the possible solution of a problem, to overcome difficulties, reorganize the disturbed relation with environment and provide emotional support. Social support leads to exchange of emotions, information, devices, and properties. Variability of behaviours which take place during interaction made it necessary to separate different categories of support, among them information support. It is related to providing information on possible ways of dealing with concrete situations, giving advice, and teaching new skills. Some of the sources of information support are: health service workers (ex. nurses/midwives, doctors), but also family, friends and support groups. The provided information should include knowledge of baby care, proper development of a baby, necessity of prophylactic vaccinations, the use of screening examinations in the diagnostics of metabolic diseases, and necessity of preparing lying-in women for basic nursing activities [2-4].

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Table 1. **The demand for information on baby care declared by the lying-in women from the study and reference groups**

No	Issues	Groups				χ^2	p
		Study n=100		Reference n=100			
		Yes	No	Yes	No		
1.	Changing diapers and dressing	28	72	3	97	23.86	<0.001
2.	Bathing	66	34	12	88	61.29	<0.001
3.	Diapers and buttock care	22	78	2	98	18.94	<0.001
4.	Holding and lying the neonate	26	74	1	99	26.76	<0.001
5.	Care of umbilical stump	75	25	33	67	35.51	<0.001
6.	Care of skin and mucous membranes	44	56	9	91	31.45	<0.001
7.	Management of regurgitation	37	63	5	95	30.86	<0.001
8.	Management of colic	54	46	17	83	29.89	<0.001
9.	Feeding during the first year of life	41	59	6	94	34.07	<0.001
10.	Infant safety	12	88	2	98	7.68	<0.01
11.	Touching the child	8	92	2	98	2.63 (Y)	>0.05
12.	Signs of neonatal transient states	63	37	31	69	20.55	<0.001
13.	Observation of concern-raising signs	63	37	22	78	34.39	<0.001
14.	Vaccinations	4	96	2	98	0.17 (Y)	>0.05
15.	Screening tests in the neonate	45	55	18	82	16.89	<0.001

χ^2 – a chi-square independence test
p – significance level
Y – Yates' correction factor

The research aimed at:

1. The assessment of the need for information support related to baby care declared by lying-in women staying in maternity ward in rooming-in system.
2. The evaluation of lying-in women's expectations concerned with the sources of support, methods and devices applied while providing information support.

Material and methods

The research included 200 lying-in women hospitalized in Clinic of Obstetrics and Perinatology, Pomeranian Medical University in Szczecin. All of them were lying-in women with physiological course of the early stage of puerperium. There were separated the study group which comprised 100 primiparas and the reference group which consisted of 100 multiparas. The youngest woman in the study group was at the age of 15, the oldest one – 38 (the median – 24.5 years). In reference group the youngest lying-in woman was 20, and the oldest – 43 (the median – 29 years).

The method applied in the research was patient medical history questionnaire and the author's research tool which consisted of 15 issues connected with information support related to baby care and provided for lying-in women staying in maternity ward in rooming-in system. The lying-in women were to define which methods, devices and information they regard as particularly valuable; they were also to appoint the most important people to convey information. The women were surveyed after they had agreed to take part in the research. The collected material was statistically analyzed with the use of the classic methods.

Results

Analysis of the questionnaire results (*Tab. 1*) was used to assess the demand for information support connected with baby care declared by lying-in women staying in maternity ward in rooming-in system. The patients from the study group declared interest in all issues more frequently than those from the reference group. Statistically significant differences ($p<0.001$) were concerned with changing diapers and dressing, bathing, diapers and buttock care, care of umbilical stump, care of skin and mucous membranes, management of regurgitation, management of colic, feeding during the first year of life, signs of neonatal transient states, observation of concern-raising signs, and screening tests in the neonate.

Statistically essential differences ($p<0.01$) occurred only in one case referred to infant safety. As for other determinants: necessity of touching the child and benefits of vaccinations, some distinctions could be noticed but statistically they were not vital ($p>0.05$).

Tab. 2 illustrates expectations of the lying-in women from the study and reference groups, referred to the sources of information support on baby care.

The patients from the study group appointed a nurse/midwife in the maternity ward as a source of information support on eight out of fifteen topics: care of umbilical stump ($p<0.001$), bathing ($p<0.001$), changing diapers and dressing ($p<0.01$), care of skin and mucous membranes ($p<0.001$), management of colic ($p<0.01$), screening tests in the neonate ($p<0.01$), holding and lying the neonate ($p<0.05$), management of regurgitation ($p<0.05$).

The primiparas chose a nurse/midwife to be the main source of information support for three out fifteen issues only: care of umbilical stump ($p<0.001$), management of colic ($p<0.05$) and

Table 2. Expectations of the lying-in women from the study and reference groups as for the sources of information support concerned with baby care

No	Issues	The study gruop											The reference group										
		The expected source of support											The expected source of support										
		The number of patients	A doctor in outpatient clinic	A doctor in the ward	A nurse/midwife in the ward	Community nurse/ midwife	Other members of medical staff	Other patients	Support groups	A husband	Family	Friends	The number of paitents	A doctor in outpatient clinic	A doctor in the ward	A nurse/midwife in the ward	Community nurse/ midwife	Other members of medical staff	Other patients	Support groups	A husband	Family	Friends
1.	Changing diapers and dressing	28			14	2**							3			2							
2.	Bathing	66			29	2***					6***		12			3					5		
3.	Diapers and buttock care	22			8						2		2										
4.	Holding and lying the neonate	26			11	1*					2*		1										
5.	Care of umbilical stump	75		1***	48	3***				1***	2***		33			20	3***				4**		
6.	Care of skin and mucous membranes	44	1***	1***	23	1***							9			5	1				2		
7.	Management of regurgitation	37	2**		16	4*				1***			5			2					1		
8.	Management of colic	54	5**		22	7**					1***		17	1*		9	2				1*		
9.	Feeding during the first year of life	41	4		7	7					1		6	2		1	1						
10.	Infant safety	12			7	1							2			2							
11.	Touching the child	8			6	1							2			2							
12.	Signs of neonatal transient states	63	3***	36	7***								31		23	5***							
13.	Observation of concern-raising signs	63	9	8	4								22	4	4	5							
14.	Vaccinations	4	1		1								2				2						
15.	Screening tests in the neonate	45	2**	9**	29								18		5	10	1*						

* $p<0.05$ ** $p<0.01$ *** $p<0.001$

*, ** or *** were put at natural numbers which statisfically much different from the biggest number occurring in the area marked with grey colour for a particular question (comparative test of two results) – Armitage P.
To make the statement clear the *** were not placed at the greatest values for particular issues if more than one answer was given.
In case of issues where only one answer was given, a star was put if the differences were statistically vital.

Table 3. Expectations of the lying-in women from the study and reference groups as for the methods and devices applied when information support is provided

No	Issues	The expected methods												The expected devices									
		The study group						The reference group						The study group					The reference group				
		The number of patients	Lecture	Training	Demonstration	Chatty lecture	Others	The number of patients	Lecture	Training	Demonstration	Chatty lecture	Others	The number of patients	Film video	Scientific book	Brochure	Materials in the ward	The number of patients	Film video	Scientific book	Brochure	The materials in the ward
1.	Changing diapers and dressing	28		22	1***	2***		3		2	1	1		28	3**	1***	16	1***	3			1	2
2.	Bathing	66		44	4***	1***		12		8*				66	6***		44		12			7*	
3.	Diapers and buttock care	22		16	1***	1***		2		1				22	1**	1**	14	3*	2			1	
4.	Holding and lying the neonate	26		19	3**	1**		1		1				26	1**	1**	12		1			1	
5.	Care of umbilical stump	75		65	3***	1***		33		29	2***			75	2***	1***	52	4***	33			20	2***
6.	Care of skin and mucous membranes	44		28	1***	9**		9		4		4		44	4***	1***	24	1***	9			5	
7.	Management of regurgitation	37		9*	1***	25		5		2		3		37			24	3***	5			3	
8.	Management of colic	54		9***	2***	40		17		2**	1**	14		54		1***	42	2***	17			12	1**
9.	Feeding during the first year of life	41	1***	9**		28	1***	6		2		4		41		1***	31	1***	6			4	
10.	Infant safety	12	1	2	1	7		2				2		12			7	1	2			1	1
11.	Touching the child	8		2	1	5		2				2		8	1		3		2				1
12.	Signs of neonatal transient states	63	1***	2***	2***	58		31		1***		30		63			52	2***	31	1***		23	1***
13.	Observation of concern-raising signs	63	2***	3***	1***	51		22		1***		18		63			49	1***	22			17	1***
14.	Vaccinations	4			1	3		2				2		4			3	1	2		1	1	
15.	Screening tests in the neonate	45		1***		44		18				18***		45			40	1***	18		1***	15	1***

* $p<0.05$ ** $p<0.01$ *** $p<0.001$

*, ** or *** were put at natural numbers which statisfically much different from the biggest number occurring in the area marked with grey colour for a particular question (comparative test of two results) – Armitage P.
To make the statement clear the *** were not placed at the greatest values for particular issues if more than one answer was given.
In case of issues where only one answer was given, a star was put if the differences were statistically vital.

screening tests in the neonate ($p<0.05$). The patients from the study and reference groups would like to be informed about signs of neonatal transient states by the doctor in maternity ward ($p<0.001$).

Tab. 3 depicts expectations of the lying-in women from the study and reference groups as for methods and devices applied to provide information support on baby care. The lying-in women from the study group much more often chose training as a method used for providing information support on six questions: changing diapers and dressing ($p<0.001$), bathing ($p<0.001$), diapers and buttock care ($p<0.001$), holding and lying the neonate ($p<0.01$), care of umbilical stump ($p<0.001$), care of skin and mucous membranes ($p<0.001$). For other six questions a chatty lecture was a method much more often chosen by the patients from the study group: management of regurgitation ($p<0.01$), management of colic ($p<0.001$), feeding during the first year of life ($p<0.001$), signs of neonatal transient states ($p<0.001$), observation of concern-raising signs ($p<0.001$), benefits of screening tests in the neonate ($p<0.001$).

The lying-in women from the reference group considerably more often appointed training as a method applied for providing information support on the following issues: bathing ($p<0.05$), care of umbilical stump ($p<0.001$), management of colic ($p<0.01$), signs of neonatal transient states ($p<0.001$), observation of concern-raising signs ($p<0.001$), screening tests in the neonate ($p<0.001$).

The women in childbirth from the study and reference groups noticeably more often appointed brochures as devices used for providing information support; in the study group it referred to twelve issues, and in the reference group – six.

Discussion and conclusions

Numerous authors emphasize the necessity of preparing lying-in women for care of a baby. Szczawińska [5] claims that staying with a baby in rooming-in system, a mother learns how to care for her baby, she becomes skilled at basic nursing activities like: bathing, and changing diapers; at the beginning she performs these activities under control of a nurse/midwife, and then on her own. According to Stright and Harrison [6] it is absolutely necessary to prepare parents for care of their baby, to assist and support them, while they are getting parental skills, and developing the relation between the parents and a child.

Święcka's [7] research show that 64% of respondents think that problematics of health-related education ought to include nursing and care of a baby. Kmita and co-authors [8] state that preparation at The Childbirth School has a very positive effect on the process of adaptation to the mother's role. It finds its reflection, among others, in successful dealing with nursing care activities during stay in maternity ward in rooming-in system.

Conclusions

1. During their stay in maternity ward, primiparas require greater involvement of health professionals in providing information support and especially giving information on baby care.
2. A nurse/midwife and a doctor are these people in maternity ward who are particularly expected to provide information support for both primiparas and multiparas.
3. Different methods (training, chatty lecture) may be applied when information support is provided and the choice should correspond with patients' needs, goals and organizational possibilities.
4. Lying-in women expect various devices used for providing information support, but in most cases they are brochures with information on particular topics.

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Nutrition habits of patients operated because of coronary heart disease: income structure linkage

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Abstract

Purpose: The purpose of the above work is description and assessment of nutritional habits of the patient group operated because of CHD in relation to their income sources.

Material and methods: Among 100 patients hospitalized in The Cardiosurgery Clinic of Pomeranian Medical University in Szczecin, (72 M and 28 F) there were collected data concerning nutritional habits and income sources. To estimate the way of nutrition there was used the method of a direct interview, led individually according to the questions of an anonymous questionnaire. Quantitative biomedical data connected with body mass index (BMI), systolic (RRs) and diastolic (RRd) blood pressure and total cholesterol (CHL) came from the hospital files.

Results: The diet of all investigated people was not consistent with the requirements of rational nutrition in respect of quality (sort of meat, brown bread, fruit and vegetables) and daily quantity of meals. This incorrectness was particularly showed in not working group of people (pensioners, people on unemployment benefits). Almost all measured parameters (BMI, CHL, RRs), except RRd, are higher than commonly admitted referenced values.

Conclusions: Our investigated category of patients proves how important is adapting to the requirements of rational nutrition, especially in lower socio-economic status societies.

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Key words: nutrition, socio-economic status, coronary heart disease.

Introduction

The social-economic situation of the Polish society has changed remarkably since the beginning of the 1990's. Similarly to other European countries, also in Poland appeared social classes with utterly different incomes and increasing disproportions among them cause probably deepening of so-called "health inequalities" [1,2]. Despite extensive knowledge concerning atherogenic factors, not many investigations evaluating patient's nutritional habits in relation to their social-economic status were carried out in our country. Therefore it appeared necessary to show the differences in nutritional habits, linked to health and disease among the people with coronary heart disease (CHD), who differ as regards incomes. Moreover, the results of reports from other countries show that unhealthy diet of people with lower social-economic status is one of the factors causing increase of the mortality due to CHD [3].

The purpose of our work is description and evaluation of nutritional habits of the patient group operated because of CHD in relation to their incomes sources.

Material and methods

In a group of 100 patients admitted to The Cardiosurgery Clinic of PMU in Szczecin, 72 male (M) at the age of 57+8.9 and female (F) at the age of 63.2+7.8 data concerning nutritional habits and income sources were obtained. To estimate the way of nutrition the method of a direct anonymous questionnaire interview was used. Quantitative biomedical data connected with body mass index (BMI), systolic (RRs) and diastolic (RRd) blood pressure and total cholesterol (CHL) were obtained from direct measurements performed while admitting patients to hospital and recorded in the hospital files.

Table 1. **Arithmetic means (x±SD) BMI, CHL, RRs, RRd in relation to income source of the investigated people**

Parameter	Income sources				
	Permanent job (n=24)	Pension (n=51)	Disability pension (n=5)	Unemployment benefit (n=20)	Pension + Benefit (n=76)
BMI [kg/m²]	28.6±4.9	30.3±4.6	26.9±2.7	29.5±5.5	29.8±4.8
CHL [mg/dl]	216.4±63.9	234.2±65.0	245.0±107.2	245.8±64.7	238.0±67.2
RRs [mm Hg]	150.3±17.4	144.8±16.8	145.6±11.5	141.6±16.3	144.0±16.3
RRd [mm Hg]	85.7±11.8	83.4±13.7	85.6±8.9	78.8±9.5	82.3±12.6

Figure 1. **A structure of the investigated people according to the place of living and their education level**

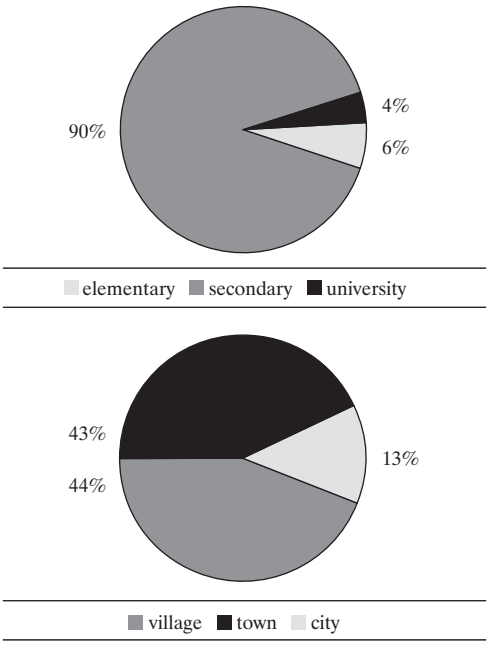
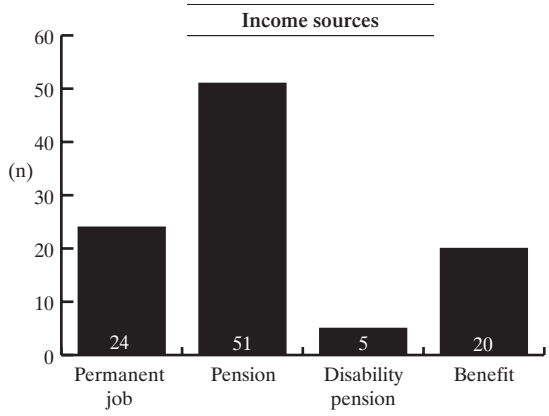


Figure 2. **A structure of the investigated people according to their income sources**



Results

The investigated group consisted of 100 people operated in The Cardiosurgical Clinic of Pomeranian Medical University in Szczecin because of advanced form of CHD. All patients were treated with the use of coronary artery bypass grafting (CABG).

Data introduced in *Fig. 1* show that the citizens coming from big cities (over 40 000 population) constituted only 13% of the investigated group. Majority of them had secondary education (90%), 6% elementary education, and only 4% university education.

Among hospitalized patients (*Fig. 2*) the most numerous group constituted not working people, i.e. pensioners and people who make the living by unemployment benefit – 76 people together, 51 M and 25 F. In examined group was only 24 percent people who had permanent incomes from work.

Average values of BMI, RRs, RRd and CHL in blood serum were presented in *Tab. 1*. Presented outcomes confirmed the diagnosis of CHD of the patients of Cardiosurgery Clinic – almost all measured parameters, except RRd, are higher than commonly admitted referenced values.

As it results from the meal consumption schedule, only the working group had 4-5 meals a day, i.e. in compliance with the rational nourishment principles (*Tab. 2*). The most numerous group consisted of retired people (56%), who consumed only 3 meals per day. The least numerous group, 20% of the investigated, were patients on unemployment benefit, who ate only 2 meals daily. In the daily menu of the not working group, especially among people on unemployment benefit, daily meals were not admitted: breakfast (31.5%), lunch (86.8%) and also afternoon snack (85.5%).

Data included in *Tab. 3* show that the material status did not have considerable influence on the sort of consumed meat. Moreover, predominance of those who prefer eating pork and beef was clear regardless of the source of income.

On the grounds of data presented in *Tab. 4* it can be easily concluded that fresh fruit and vegetables are eaten once a day by only 19% of the investigated, and 17% (pensioners and people on unemployment benefit) did not consume them at all. Brown bread was not eaten by 86% of the patients, among whom there were 72% of not working ones. Above 3/4 (74%) of the patients are reported not to eat fish and they never eat.

Discussion

The review of the literature concerning socio-economic factors and their relations with CHD, made by Kaplan and Keil [4] showed that socio-economic status is the essential factor which modifies the progress of the disease. Because of difficulties

Table 2. **The quantities of the investigated people according to categories of frequency of meal intaking habits and income sources**

Frequency categories of consumed melas	Income source of the investigated people			
	Permanent job	Pension	Unemployment benefit	Together
Breakfast				
Never	-	9	15	24
Usually	3	19	2	24
Always	21	28	3	52
Lunch				
Never	1	48	18	67
Usually	5	5	1	11
Always	18	3	1	22
Diner				
Never	-	-	-	0
Usually	-	22	1	23
Always	24	34	19	77
Afternoon snack				
Never	-	45	20	65
Usually	4	9	-	13
Always	20	2	-	22
Supper				
Never	-	-	-	0
Usually	2	-	-	3
Always	22	55	20	97

Table 3. **The quantities of people according to prefered sort of meat and incomes source**

Prefered sort of meat	Number of people according to income source				
	Permanent job	Pension	Disability Pension	Unemployment benefis	Together
Pork	8	22	2	7	39
Beef	9	17	1	9	36
Poultry	5	11	1	3	20
Fishes	2	1	1	1	5
Together	24	51	5	20	100

Table 4. **The quantities of people according to weekly frequency of intaking of selected food products and income sources**

Product: frequency of intaking	Income source				
	Permanent job	Pension	Disability pension	Unemployment benefit	Together
Fresh fruit and vegetables					
1. more than once a day	-	-	-	-	0
2. once a day	4	15	-	-	19
3. at least once a day	20	31	5	8	64
4. never	-	5	-	12	17
Brown bread					
1. more than once a day	-	-	-	-	0
2. once a day	-	-	-	-	0
3. at least once a day	-	10	2	2	14
4. never	24	41	3	18	86
Milk and its products					
1. more than once a day	-	48	5	8	61
2. once a day	20	3	-	12	35
3. at least a day	4	-	-	-	4
4. never	-	-	-	-	0
Fishes					
1. more than once a day	-	-	-	-	0
2. once a day	-	-	-	-	0
3. at least once a day	10	2	-	2	14
4. never	12	39	5	18	74

in obtaining detailed information about the value of incomes of the investigated people, we used indirect data in our work; assuming that working people have higher incomes than pensioners and people on unemployment benefit. Nutrition habits of the investigated group of patients suffering from CHD are an example of the diet leading straight to the operation in the Cardiosurgery Clinic. As it appears from *Tab. 2* in the diet of the investigated were too few products containing: mono- and polyunsaturated acids, fibre, mineral elements and vitamins. Obtained results confirmed the preference of so-called red meat with low fish and white meat consumption and insufficient consumption of fruit and vegetables by the patients from the Cardiosurgery Clinic irrespective of their income sources, similarly to the majority of Polish population. Population investigations indicate explicitly, that regular eating of fish is connected with decreasing of CHD and stroke [5] similarly to the diet rich with fibre (vegetables, fruit, brown bread) [6,7]. In the Polish literature available for us cohort studies similar to our profile of our investigations were not found. However, Finnish investigation showed that people with higher socio-economic status consume more cheese, vegetables and fruit with a lower amount of bread, butter and milk [8]. Other studies indicate higher consumption of saturated acids and low consumption of fruit and vegetables in the male group with low socio-economic status when in the female group these differences were not statistically significant [9]. In Polish studies, where the changes in daily diet of the Warsaw population in the years 1984-1993 were analyzed, it was assumed that the income influenced on the structure of diet of the investigated people and the people having better financial abilities adapted to a higher level their nutrition to the recommended ones in prevention of atherosclerosis [10].

Proper nutrition means not only satisfying the organism's needs concerning energy and feeding components, but also such daily meal arrangement which enables providing all necessary nutrition's components in every basic meal [11,12]. In our study the explicit majority of working people from the investigated group ate 4-5 meals a day, while the patients on unemployment benefits consumed usually only 2 meals. In the second group

one can easily observe a shift of the meals to the afternoon and evening hours, resulting probably from poverty or bad feeding habits.

Conclusions

Our investigated category of patients proves the importance of adoption to the requirements of rational nutrition, especially in lower socio-economic status societies. The basis of all recommendations, not only for this group of patients, who are in danger of the loss of life, should be quite old but still actual thesis that no therapy or supplementation can replace rational nutrition and a healthy lifestyle.

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Depression and anxiety in elderly patients as a challenge for geriatric therapeutic team

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Abstract

Coexistence of many illnesses of various etiology in elderly patients is one of the most important issues of contemporary geriatrics. Frequent coexistence of depression and fear is one of the increasing problems in general clinical picture. Depression and fear are responsible for unclear and non-uniform clinical signs. They may modify the course of many illnesses and make diagnosis difficult.

Firstly, the aim of research was to determine the difference of anxiety level in depressed patients compared with patients not suffering from depression. Secondly, examining if there is a dependence between the anxiety level and depression exacerbation. Thirdly, researching what types of psychical and somatic signs are most often related to anxiety.

Total number of examined patients amounted to 60 persons aged 65 and older. The persons were treated in The Geriatric Clinic of Medical Academy in Bydgoszcz. The patients did not suffer from dementia and their somatic state allowed to examine them. Geriatric Depression Scale (GDS) was used in the research. Anxiety level was examined with Hamilton Anxiety Scale (HAMA). Medical history on the patients current life situations was collected. The patients were divided into two groups of 30 persons based on the GDS examination result. One of the groups gathered patients with the signs of depression in every person while the other grouped those without depression.

Examination results proved that the anxiety level in depressed patients is significantly higher than in non-depressed patients. They also showed what kinds of psychical and somatic signs are most often related to anxiety. Taking depression and fear symptoms into consideration makes the therapy proper and causes relief for the patients and makes them feel better. Interdisciplinary approach to treatment of elderly patients, covering medical and non-medical areas of life can help in limiting the number of recurring hospitalization.

Key words: depression, anxiety, coexistence, old age, therapeutic team, quality of life.

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Introduction

Depression is the most common mental disorder appearing in elderly age. It has become an increasing clinical and social problem [1]. There is an increased risk of occurring depression or its relapse in the elderly age. Following episodes of disease are prolonged and the periods of remission shorten. Symptoms of depression maintain usually for few months or even longer in the elderly patients [2]. In these patients, depressive disorders that are resistant to the treatment are more common. One of the most common symptoms, accompanying depressive disorders in the elderly patients, is anxiety. Its intensity and duration may differ among different patients. The anxiety may touch many different spheres of life. In the emotional sphere, it may manifest as: sense of threatening, sense of constant tension, inability to relax, difficulties in decision making. In the cognitive sphere, anxiety usually causes deterioration of concentration, and makes that feelings dominate over rational evaluation of situation. In the behaviour, anxiety is usually manifested by hyperactivity such as: inability to rest in one position while sitting or lying, necessity of walking or bending of hands. Sometimes anxiety and its symptoms induce thoughts of serious somatic illness. The anxiety may manifest itself as headache, hypertonus, palpitation, dyspnoea,

sense of choking, dryness in mouth, sweatiness, pressure in urinary bladder, chronic constipation and others. One of the most frequent somatic symptoms is pain in the chest described as pressure or weight around heart, it is an anxiety called "precardiac phobia". Elderly patients with anxiety symptoms caused mainly by depression often complain of pain. Most of them suffer from many different somatic disorders, thus differentiation of pain complaints caused by anxiety or somatic disorders may be difficult. The anxiety coexisting with depression in the elderly patients causes lower self-esteem, and sometimes becomes life-threatening symptom, because it may intensify suicidal thoughts and tendencies. Suicide rate increases with age, and is highest among people between 60 and 80 years old. Elderly people do not usually take up suicidal attempt without serious intentions of killing themselves. Therefore, early diagnosis of depression and suicidal menace is essential. Screening tests are required among elderly people who came to health care service to improve diagnosing of depression [2-8].

It is very important to be able to appropriately treat an elderly patient. It is crucial to remember about the fact of multiple illnesses and high risk of functional inefficiency occurrence. According to Motta and others [9], you can not only treat the current illness but you have to take a general approach to the health problems of the elderly patients. It is also very important to protect the patients against possible dangers and threats during hospitalization and to increase the general efficiency of the patient that influences the quality of life. It is essential in geriatrics to distinguish the natural ageing symptoms from illnesses typical for the elderly (osteoporosis, falling, incontinence of sphincters and others) as well as from illnesses coexisting with elderly age (diabetes, hypertension, cardiac insufficiency) having other symptoms than with younger patients. Psychological state of patients has tremendous influence on the way the senior patients suffer. Significantly changed life conditions (family, social, economical) have also impact on the course of the illness in geriatrics. Described examples prove that therapeutic team is the basis for geriatric treatment. Various specialists cooperate on the therapeutic team. There are doctors of many specialities, nurses, psychologist, physiotherapist and a social worker. This group of specialists is an important factor protecting against the risk of an early recurring hospitalization of patients [10].

Aim of this study

The aim of this study was to determine differences in anxiety level among hospitalized patients suffering from depression compared with patients without depressive disorders. The study aims at testing whether there is a relationship between anxiety level and intensification of depression and determining which of somatic and psychiatric symptoms are most often related to anxiety.

Material and methods

The research was set in The Geriatric Clinic of Ludwik Rydygier Medical Academy in Bydgoszcz, in 2004. Patients included in this study were elderly people (65 years or more), without dementia, whose health state allowed to examine them. They were admitted to The Geriatric Clinic for holistic geriatric examination. Patients included in this study were divided into two groups, 30 persons each. The first group consisted of patients, whose Geriatric Depression Scale score indicated the presence of depression, which was confirmed by observation and anamnesis conducted according to ICD-10 criterions of diagnosing of depression. The second group was formed by patients, whose GDS score indicated lack of depressive disorders.

Full version of Geriatric Depression Scale (GDS) was used in the research consisting of 30 questions [11]. Anxiety level was measured with Hamilton Anxiety Scale (HAMA). The anxiety is measured as a psychopathological syndrome that is a complex of psychical, somatic and behavioural symptoms measured in five-degree, fourteen positional scale. Following socio-demographical variables were controlled: age, gender, marital state, children, education, health state self-esteem, place of living and income.

Table 1. **Descriptive statistics for anxiety level variable, all patients included**

HAMA	All patients (n=60)	Patients without depression (n=30)	Patients suffering from depression (n=30)
Average	18.1	9.5	26.6
Minimum	3.0	3.0	12.0
Maximum	39.0	23.0	39.0
Standard deviation	10.6	5.7	6.9

Results

Sixty patients aged 65 and over were included in this study. The average age was 75.7. The group consisted of 47 women (78.3%) and 13 men (21.7%). Patients included in the study were divided into two groups, 30 persons each. There were 22 women and 8 men at the age between 65 and 93 in the first group. These patients had no symptoms of depression according to Geriatric Depression Scale score. In the second group there were 25 women and 5 men in the age between 65 and 86 years. These people's Geriatric Depression Scale score indicated presence of depressive disorders. Both groups had similar age, marital state, educational level and life conditions indicators. The group included in this study was representative according to marital state, educational level, and income for the population of elderly people. The anxiety level in the HAMA scale in the whole investigated group was 18.1. Among patients without depressive disorders, it was 9.5 and among patients with depression 26.6. Descriptive statistics of variables: anxiety level, depression level are listed in *Tab. 1-3*.

Cognitive functions in both groups were similar. Average score in MMSE among patients without depressive disorders was 28.8, and 28.0 in the second group.

Statistical analysis proved that differences in anxiety level

Table 2. **Distribution of HAMA scale scores for patients included in the study**

HAMA score, anxiety level	Patients without depression		Patients suffering from depression	
	Patients	Percent	Patients	Percent
Below 17 (no symptoms or mild)	25	83.33	2	6.67
18-24 (mild to moderate)	5	16.67	12	40.00
25-30 (moderate to heavy)	0	0.00	9	30.00
Over 30 (heavy to very heavy)	0	0.00	7	23.33

Table 3. **Descriptive statistics for depression level variable, all patients included**

GDS (depression level)	All patients (N=60)	Patients without depression (N=30)	Patients suffering from depression (N=30)
Average	10.2	4.8	15.6
Minimum	0.0	0.0	11.0
Maximum	25.0	10.0	25.0
Standard deviation	6.5	3.0	4.2

Table 4. **Correlations between depression level, particular symptoms measured with Hamilton Anxiety Scale and anxiety level**

Correlations
Statistically relevan level p<0.05000
N=60

	1 Anxious mood	2 Tension	3 Fears	4 Insomnia	5 Intelectual	6 Depressive mood	7 Somatic complaints – muscular	8 Somatic complaints – sensory	9 Cardiovascular symptoms	10 Respiratory symptoms	11 Gastrointestinal symptoms	12 Genitourinary symptoms	13 Autonomic symptoms	14 Behaviour at interview	Anxiety level	Depression level
depression level	0.72*	0.64*	0.44*	0.55*	0.53*	0.70*	0.29*	0.24	0.53*	0.37*	0.48*	0.40*	0.52*	0.53*	0.81*	1.00

between both groups are highly relevant as computed using Mann's and Whitney's U test (Z=-6.28; p<0.0000001). The study confirmed hypothesis stating that there is a correlation between anxiety and depression level among elderly patients. Pearson's r correlation factors indicate that depression level correlates with almost all symptoms measured with Hamilton's Anxiety Scale. The higher depression level, the higher anxiety level (r=0.81; p<0.05) – *Tab. 4*.

According to the averages obtained from analysis of particular questions of HAMA questionnaire, we found that the most common anxiety symptoms among patients suffering from depressive disorders were: vegetative symptoms such as dryness in mouth, increased sweatiness, skin redness or paleness; insomnia (difficulties in falling asleep, intermitted sleep or bad dreams); tension (dreading, crying, and palpitations); gastric symptoms (difficulties in swallowing, nausea, vomiting, constipation, weight loss); cardiovascular symptoms (palpitations, pain in the chest, notion of fainting).

Discussion

Anxiety is quite a common symptom that accompanies depressive disorders among elderly patients [7]. According to publications, anxiety accompanies depressive disorders in elderly patients 15-20 times more often [6]. This study indicated that compared groups (patients suffering from depressive disorders vs patients without symptoms of depression) relatively differed statistically, concerning anxiety level measured with Hamilton's Anxiety Scale. Among patients without depressive disorders Hamilton's Anxiety Scale average was 9.5 (from 3 to 23 points) compared with the second group (patients suffering from depression) it was 26.6 (from 12 to 39). Analysis of those averages proved that among patients without depressive disorders, there is lack of anxiety symptoms, or they are mild. Among patients with depression, anxiety symptoms are moderate or heavy. Among patients who had no symptoms of depression, none had heavy or very heavy anxiety symptoms, in the second group such signs were found in 7 patients. According to literature, general state of patients who have depression coexisting with anxiety disorders is worse when compared with patients who have depression without anxiety disorders. Coexistence of depressive and anxiety symptoms has great influence on debilitate level, social function and behaviour oriented for search for help [13]. This study over population of geriatric patients confirmed possibility of existence of many different disease symptoms, which often had no reason in patients physical state. The most common anxiety signs found among patients suffering from depression were: vegetative symptoms, insomnia, tension, gastrointestinal and cardiovascular symptoms. These examples

verify hypothesis stating that, psychological and somatic anxiety symptoms coexist with depression and may dominate in clinical features of such disorders. Anxiety may be the reason of physical symptoms that may be misdiagnosed as a somatic disease. Both, acute and chronic anxiety disorganize human complex activity, sometimes may be responsible for exclusion out of social life. Heavy between anxiety disorders and depression seems to be less evident, when we consider the latest studies anxiety may cause exhaustion or even desiccation [6,14].

Our study proved, that there is a direct relationship between intensification of depression and anxiety level among hospitalized elderly patients: the higher depression level, the higher anxiety level. Depression level correlated positively with particular anxiety symptoms: psychiatric, somatic and behavioural included in Hamilton's Anxiety Scale. This conclusion confirms that clear separation between depression and anxiety symptoms may be sometimes difficult. Clear demarcation between anxiety disorders and depression seems to be less evident, when we consider the latest studies of distribution of this kind of disorders in population. According to epidemiological data, depression and anxiety coexists much more often than it was expected [15]. Clinical practice also proves that both disorders infiltrate, however, in individual cases they are significantly different diagnostic categories. Some authors use the term depressive-anxiety syndrome to describe coexistence of anxiety and depressive disorders in elderly patients, this category has its equivalent in the ICD-10 classification (mixed depressive and anxiety disorders). Using this category is justified when both depression and anxiety symptoms are present, but none of them is intensive enough to diagnose it individually. Variable tendencies of dominating symptoms are characteristic for that kind of disorders [16-18]. Differential diagnosis is difficult among elderly patients, because clinical signs are not specific. Signs of depression and anxiety may manifest as "somatic mask" (complaints are not specific) or may be prefaced by somatic disorders [6]. Depression and anxiety when not diagnosed, cause a lot of serious health damages which are often iatrogenic. When mistreated, depression and anxiety may cause insomnia, pain syndromes, pain killers and hypnotic drug addiction as well as increase of suicide ratio. Moreover, wrong diagnosis causes irrelevant tests and costs of medication.

To improve diagnosing of depression and anxiety interdisciplinary approach for diagnosing and treatment of elderly patients is needed. Knowledge of clinical features of depression signs and cooperation with people who have experience in psychiatry of elderly patients is also required. Correct diagnosis of these disorders precises epicrisis and simplifies taking up the best treatment [19,20].

Conclusions

1. Difference in anxiety level between patients with depression and patients who have no signs of such disorders is statistically relevant. Group of depressed patients had higher anxiety level when compared with the group of patients without depressive disorders.
2. Among patients included in this study, the most common anxiety signs were: vegetative symptoms, insomnia, tension, gastrointestinal and cardiovascular symptoms.
3. There is rectilinear relationship between depression and anxiety level in elderly patients. The higher depression level, the higher anxiety intensification.

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The knowledge of pedagogic students on suicidal behaviors in adolescents

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Abstract

Suicide, taking one's own life, seems to be in contradiction with the will to live. However, it is not so obvious, as there is not the same patterns of behavior for all people. People differ from one another as far as reactions, behavior, and actions are concerned. Some are mobilized, others are discouraged by failures. It is often thought that suicidal behavior occurs due to a mental disorder. The purpose of the study was to check the knowledge of IV-year-students of Pedagogy and Psychology of The University in Białystok concerning suicidal behavior. Danger of suicidal phenomenon among young people was also to be noticed and discussed. The examination was conducted in the group of 50 students of the IV year of Pedagogy and Psychology of The University in Białystok in 2002. Students, 21-25 years of age, comprised the most numerous group. Women were the majority (84%) while men were 16%. The examination tool was the questionnaire of 29 open and closed questions. The analysis of the results points to the fact that making a decision of suicide is a result of long reflections expanded in time. Personal and family problems are most common causes of suicidal behavior given by the responders. Social isolation and bad mental condition were behaviors indicating the will to commit suicide. Lonely people, chronically ill, emotionally immature and the young people were those of the high risk groups. According to the examined students, pain connected with physical suffering may influence suicidal behavior.

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Introduction

Human life is the value in itself. However, a man is capable of choosing between life and death as he possesses the free will. The choice is controversial for some people because decisions and responsibilities of existence depend on them no matter how great their failures are.

Suicide is one of the most frequent causes of youths deaths [1]. Young people are specifically exposed to suicide due to a difficult puberty and emotional instability [2]. The risk of committing suicide by a child under 10 years old is slight although the age limit as far as destructive behavior is concerned is lowered [3,4]. The number of suicides, however, is increased among young people at the age of 20 [5]. Suicide is connected, according to the youths, with freedom and is, in a way, an attempt to attract other's attention in view of accumulated problems [2]. It is sometimes a conscious act of aggression directed towards real people in the closest environment. The act which has serious consequences and gives strong feeling of guilt. Suicide is one of most drastic ways of influencing other people [4,6].

In the prophylaxis of suicidal behavior, a detailed analysis of mental condition before a suicidal attempt (a prodromal phase, noticed as the state of psychic crisis) is of great importance [5]. The prodromal phase shows the symptoms which denote suicide. These are: dyssomia, anxiety, psychosomatic complaints, and such behavior as rebelliousness, drinking alcohol, bad school marks [7]. Prodromal period may last for several months and its dynamics is differentiated individually. Therefore there is a real possibility of preventing suicide [5,7].

Suicidal behaviors will not be a problem only when specialists and the society enter the fight against them. Each man who can recognize signals of danger can save a youngster who lost his sense of life. It is particularly important in work with young people who are immature emotionally and seek for the place in

the world. Thus, listening and observation are crucial in coping with a man in a critical situation.

The aim of the study was to check the knowledge of the IV-year-students of Pedagogy and Psychology of The University in Białystok concerning suicidal behavior in young people.

Material and method

The examination was conducted among the students of the IV year of Pedagogy and Psychology in 2002. Questionnaire was filled by 50 people (42 women – 84% and 8 men – 6%). The most numerous group comprised of students, aged 21-25 years (62%) while 24% were 26-30 years of age, and 12% – 31-35 years. There were no people below 20 and above 40 years of age. The examination was based on the author's questionnaire including 29 open and open questions. The analysis concerned the knowledge of the students on suicidal behavior with particular stress put on youths behavior.

Study problems were concentrated on the following points:

- what are the most common causes of suicidal behavior?
- what symptoms can reveal the will to commit suicide?
- what is the duration of decision making by an endangered person?
- are there groups of increased risk of suicide?
- is there any relationship between the suicide and aggression or autoaggression?
- what are the diseases that can induce the suicidal behavior?

The students were informed about the aim of the study and consented to the examination, which was anonymous. The surveys were filled in the presence of the examiner and every ambiguity was cleared while writing. Data were collected and presented in tables and diagrams, the graphic analysis was performed in Excel and Word.

Results and discussion

According to responders, among the causes of suicidal attempts, there are unhappy love, inability to cope with problems, family problems, misunderstandings, school problems, rejection by environment, loss of a close person or a life goal, incurable diseases. Loneliness, lack of hope and self-acceptance happen to be in the background. The responders also connected suicidal behavior with depression and mental disorders or an attempt to attract other's attention and "crying for help". Physical or psychic harassing may also be a factor leading to an attempted suicide (*Tab. 1*).

The causes of suicide attempts given by the students are in accordance with the literature. It is well known that each of them can bring about lack of the will to live, specifically when the problems accumulate. On the other hand, not everyone tries to take his life when he experienced disaster, but there are very sensitive people, weak psychically, who cannot deal with everyday problems. Another issue to study was students' awareness of symptoms that can reveal the will to commit suicide. Most of people's actions is preceded by various signs of the will to fulfill them. The same is attributed to the attempt of life taking: an individual tells the surrounding about the intention. Sometimes the signals are very weak, sometimes they "cry out". However, it is usually difficult to distinguish them and it is still more hard to believe in them and try to prevent.

Table 1. **Chosen causes of suicidal behavior according to the students**

Causes of suicide determined by students	N	%
1. unhappy love	20	40
2. inability to cope with problems	20	40
3. bad financial situation	17	34
4. family problems, misunderstandings	14	28
5. school problems	13	26
6. rejection by environment	13	26
7. loss of a close person	12	24
8. loss of work	12	24
9. incurable diseases	9	18
10. loss of aim in life	8	16
11. big problems	8	16
12. loneliness	7	14
13. divorce	6	12
14. addictions	5	10
15. work problems	4	8
16. depression	3	6
17. lack of self-acceptance	3	6
18. dismissal	3	6

* data are not summed up due to multiplication of choice

The symptoms, described by the responders, were different. The majority of answers pointed to "social isolation", "becoming withdrawn"; the other symptoms are presented in *Tab. 2*.

It is disturbing to notice that people attempting a suicide "do not have any symptoms" and "behave normally". Then, a question can be set to what extent the symptoms really do not exist and to what extent they are invisible. It seems that the symptoms concern bad psychic feelings and disturbed perception of oneself in the world outside. The students observed that a person who feels internally unhappy is usually isolated and, mostly, has difficulties in contacts with the closest surrounding which all leads to suicidal thoughts.

Giving away one's belongings, putting one's affairs in order-before the final farewell is a very significant and radical symptom according to Anthony et al. [8,9]. Only 4% of the students were aware of the existence of that symptom. The survey clearly showed that the knowledge of suicidal symptoms among the students is not adequate and based on myths.

Suicide is a decisive process expanded in time and therefore the students were asked about the time of making a decision to commit suicide; whether it comes to one's mind suddenly or is a result of long thinking. That question was not answered by 4% of responders, 76% thinks that the decision is made after long thinking, and 20% – that the thought occurs instantly (*Tab. 3*).

The answers can be interpreted differently; e.g. the first thought of committing suicide is realized or maybe the thought occurs in time and the deed is a sudden reaction. On the other

Table 2. **Symptoms denoting the will to commit suicide**

Somatic diseases *	N	%
Neoplasms	22	44
Incurable diseases	17	34
AIDS	14	28
Cripplehood	10	20
Paralysis	4	8
General suffering	3	6
Sclerosis multiplex (SM)	2	4
Jaundice	2	4
Amputation, Alzheimer Syndrome	1	2
Bone diseases, epilepsy	1	2
Chosen psychic/social diseases	**N**	**%**
Mental disorders	18	36
Depression	12	24
Alcoholism	8	16
Drug-addiction	6	12
Anorexia	3	6
Bulimia	2	4

* data are not summed up due to multiplication of choice

Table 3. **The origin of suicide decision according to the responders**

Origin of suicide decision	N	%
Sudden	10	20
Result of long thinking	38	76
Lack of answer	2	4
Total	50	100

Table 4. **Chosen diseases that can induce suicide attempts**

	Symptoms described by the students	N	%
1.	social isolation	25	50
2.	becoming withdrawn	21	42
3.	mood changes, irritation	14	28
4.	talking about suicide	12	24
5.	depression	10	20
6.	absent-mindness	7	14
7.	indifference	5	10
8.	signaling the problem	5	10
9.	aggression	5	10
10.	maintenance that life is senseless	4	8
11.	people have no symptoms, they behave normally	3	6
12.	take refuge in bad habits	2	4
13.	pessimism	2	4
14.	behavior changes	2	4
15.	taking away one' s things	2	4
16.	bidding close people farewell	1	2
17.	attract others' attention	1	2
18.	shutting oneself away	1	2
19.	such people are insecure	1	2

* data are not summed up due to multiplication of choice

hand, a person tries to manage his problems and "suddenly" comes to his mind that he should take his life. The literature on the subject confirms observations of 76% of the responders who noticed that suicide requires long hours of thinking. A man first internalizes the idea of giving up life, thinks it through and then chooses the way and time to do it. These activities are expanded in time; there are people who live thinking about committing suicide for months and even years.

Another analyzed question touched upon risk factor groups. The students pointed out the following groups: lonely, chronically ill, addicted, mentally disordered people, those who do not know how to cope with problems, stress-prone, disappointed in love affairs, psychically weak, those who do not accept themselves, emotionally immature, young people in puberty, isolated people. Prisoners, sect members, subculture members, policemen, soldiers, and artists are more specific risk factor groups.

As we can see, there are discrepancies in observations. It seems that each field of life, profession, property, life situation are in the group of high suicidal risk. Everyone can actually do it in given conditions, usually extreme. The next question asked was the relation between suicidal attempt and an illness. Only 6% did not find such diseases, however, 94% agreed with those presented in *Tab. 4*. The responders enumerated more somatic than psychic diseases. It appears that physical pain is for the students a dominant factor leading to suicide. However, according to the literature on this subject, psychic diseases have a strong influence on suicide. Psychic suffering, lack of faith in oneself, love and hope, burdening oneself with others' problems are the main causes of suicidal attempts.

It is assumed that most diseases, especially chronic and incurable, may cause the life loses its sense. Therefore, it is essential for an ill person to have a group of support, family and friends, who could help in emotionally difficult moments. The responders' points of view on the relation between suicide and aggression or autoaggression was also examined. It turned out that 36% connected it with autoaggression, 22% with aggression (however, they did not directed it), and 18% thought suicide had nothing in common with aggression.

Suicide is an autoaggressive action. However, the action can be also directed against a given individual or environment and then the victim wants to arouse the feeling of guilt in the individual. The prophylaxis of suicidal intentions is difficult and requires the knowledge of both the causes of autoaggressive behavior and symptoms of a person's bad psychic condition. Experienced crisis is usually unnoticed as it concerns the inner side of the individual. Young people fighting with "the unfriendly" world are not lucky enough to find a specialist at the early stage of their problems. Thus, knowing the signals of threat is so important for such people as teachers, medical staff, priests, etc.; those who have contact with endangered young people. A vast knowledge on suicidology is not able to eradicate the phenomenon but it can facilitate its diagnosis and prophylaxis.

Conclusions

1) The most common causes of suicidal behavior were, according to the responders: unhappy love, inability to cope with problems, family and school problems.

2) The symptoms seem to be a social isolation and becoming withdrawn. They concerned bad psychic condition and disturbed perception of oneself in the world.

3) According to most students, the decision of suicide is a result of long thinking expanded in time.

4) The high risk groups are: the lonely, chronically ill, addicted, with mental disorders, emotionally immature people, and the young people.

5) Somatic diseases are, according to the students, the main cause of suicidal attempts. Pain connected with physical suffering has a dominant influence in suicidal behavior.

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Prevalence of visual acuity anomalies among pupils in age 7 and 8 years in Westpomeranian Region (Poland)

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Abstract

Purpose: Evaluation of visual acuity anomalies among 7 and 8 year olds pupils in Westpomeranian Region in the aspect of school nurses health services quality in that matter.

Material and methods: Representative sample (n=141) from the whole population of 7 and 8 years old pupils of Westpomeranian schools were screened for visual acuity with the use of Snellen standard boards. Classical methods for statistical analysis of results were used.

Results: 141 children were examined, among them 59 (42%) from urban areas and 82 (58%) from rural areas. The prevalence of abnormal visual acuity in general population of children in the age of 7 and 8 years in the region was estimated on the base of results from studied sample on the level of 17.7%±5.0% for confidence interval 95% and was in the range 12.3-24.9%.

Conclusions: High prevalence of visual acuity anomalies in general population of pupils (17.7±5.0%) indicates that more intensive preventive care is needed, also serving by school nurses. Precision in defining methodical approach in nursing care and procedure standards with respect to the affected pupils will result in improved preventive strategies.

Key words: pupils, visual acuity anomalies, school nurses.

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Introduction

Preventive health care over pupils is assigned to general practitioners, dentists, school nurses [1]. Planning and realization of health care services in the school area such as: health promotion, diseases prevention, diagnostic, care and treatment services belongs to school nurse duties [2]. Abnormal visual acuity and refraction errors are common and very troublesome changes in sight organ. Their role in creating well-being, life quality, learning progress and school functioning of a child is essential. Their basic reason is disproportion between eye optical refraction and eye bulb axis. The prevalence of this abnormality is frequent, 10-40% among school children [3-7].

Material and methods

Assuming that the expected prevalence of visual acuity anomalies is 10%, minimal sample number [8,9] was calculated as 139 from 41980 pupils, aged 7-8 years attending to Westpomeranian schools. From the list of public schools delivered by School Inspectorate, 5 placements with basic schools on their area were chosen randomly. With the agreement of all interested persons (pupils, parents, local authorities and school nurses) 141 children took part in our study. Their age was 7-8 years +/-3 months.

Each child, who accepted the procedure, was examined with the use of Snellen standard boards. Examined persons were standing front to the board, distance was 5 meters, board hanging at the level of their eyes, place (medical cabinet) was illuminated appropriately. The Snellen board contained black, dull numeric optotypes on white, dull background. The examination was done over each eye of a child, with appropriate covering of other eye at the same time. The task of a child was to read exactly numbers pointed by examiner. Visual acuity of examined persons was expressed as the ratio of the range to the Snellen board to the distance were healthy eye can see the sign normally. Normal visual acuity was noted as follows: visual acuity of right

Table 1. **II Quantitative comparison of number of pupils in age 7 and 8 years in Westpomeranian area, together with examined sample**

Age (years)	Sex	Westpomeranian schools population		Examined sample – cities (C)		Examined sample – villages (V)		Children from cities and villages – comparison C and V (p)	Examined sample	
		n	%	n	%	n	%		N	%
7	M	10 581	25.2	11	18.7	21	25.6	p>0.32	32	22.7
7	W	10 227	24.4	12	20.3	15	18.3	p>0.76	27	19.1
8	M	10 787	25.7	17	28.8	22	26.8	p>0.79	39	27.7
8	W	10 385	24.7	19	32.2	24	29.3	p>0.70	43	30.5
Total	M+W	41 980	100	59	100	82	100		141	100.0

eye VRE 1.0 (visus right eye) and visual acuity of left eye VLE 1.0 (visus left eye).

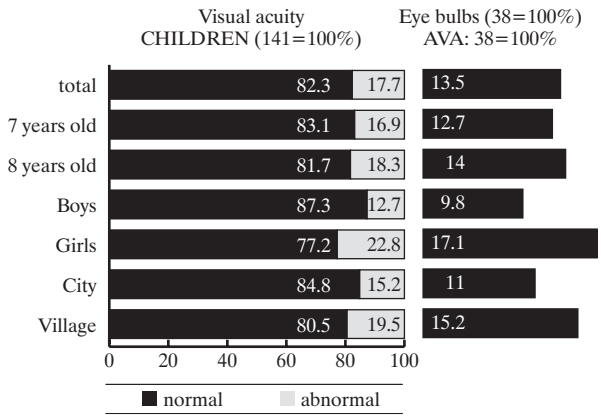
Obtained numeric data were statistically analysed [8,10]. Statistical was done with the use of STATISTICA 5.1 PL for Windows 95/NT software. Comparisons of quality features for both groups of children (rural vs city areas and with normal vs impaired visual acuity) were done with the use of chi-square test or chi-square test with Yates correction. For quantitative features U Mann-Whitney test was used. Correlation of two quantitative features was characterised by sample number (n), Spearman's rank correlation index (r_s), Pearson's lineal correlation index (r) and p values for these indexes in lineal correlation.

Results

141 children were examined, among them 59 (42%) from urban areas and 82 (58%) from rural areas. Representativeness of the sample shows *Tab. 1*, containing also the results of quantitative comparison of general population of 7-8 years old pupils of Westpomeranian region together with quantitative structure of examined sample, taking into account small cities and rural backgrounds. Compatibility chi-square (chi^2) test for structure of 7 and 8 years old children (boys and girls) of general population (N=41980) with the structure of examined sample (n=141), with the number of freedom degrees on level of 3 (n.f.d.=3) showed that chi^2 was 4.027 (by n.f.d.=3; p>0.20). This allows a statement that the structure of examined sample was compatible to the structure of general population under study and the results may be interpreted as representative for analysed population of 7-8 years old pupils in Westpomeranian area, with level of mistake ±5% (by n.f.d.=3; test $\chi^2=3.995$; p>0.20).

According to *Tab. 1* no statistically significant difference was seen among population structures of rural and urban areas. In examined sample 9 (6.38%) children were wearing correction glasses. Normal visual acuity of both eyes was estimated by 116 (82.3%) children, and by 25 pupils (17.7%) abnormalities in visual acuity of one or both eyes were detected. Study showed that 86.6% of children had normal visual acuity (NVA) of a right eye (RE) and 13.4% (19 children) had anomalies in that matter. Examination of visual acuity of left eye revealed 17 pupils (12.1%) having abnormal visual acuity (AVA). In the group of children with AVA, 12 (48% of that group) had vision errors of both eyes. After visual acuity evaluation of our studied sample (n=141) the number of children with AVA within this group was 25 (17.7%). Age, sex and environment structure evaluation of this group was done.

Figure 1. **Proportions of examined pupils/eye bulbs with NVA and AVA in total and according to age, sex, environment – Westpomeranian region**



Among children with AVA 10 (40%) were 7 years old, among them 6 girls and 4 boys, 15 (60%) children were 8 years old, among them 10 girls and 5 boys. Pupils from rural areas (64%) were dominating over children from urban areas (36%) in examined sample.

The prevalence of visual acuity anomalies in general population of children in the age of 7 and 8 years in Westpomeranian area was estimated on the base of results from studied sample on the level of 17.7%±5.0% for confidence interval 95% and was in the range 12.3-24.9%. *Fig. 1* shows percentage proportions of children and eye bulbs according to normal visual acuity (NVA) and abnormal visual acuity (AVA) screening test. These data support the importance of this health problem and indicate the necessity of diagnostic procedures to be performed by eye specialists among children in early school years, in Westpomeranian region.

Proportions of examined children shown in *Fig. 1* informs that abnormal results of visual test affected 17.7±5.0% of total examined population and they were higher by:

8 years old (18.3%) than 7 years old (16.9%); girls (22.8%) than boys (12.7%); children from village schools (19.5%) than city schools (15.2%).

It is obvious that proportions of eye bulbs with AVA were

different from proportions of children. AVA in total was noticed in 38 (13.5±5%) eye bulbs, and their specific proportions distribution were identical to evaluation of internal structure of studied children group. AVA was relatively more frequent by: 8 years old pupils (14.0%) than 7 years old pupils (12.7%); girls (17.1%) than boys (9.8%); children from village schools (15.2%) than from city schools (11.0%).

Discussion

Obtained results of visual acuity screening test were divided in two categories: normal visual acuity (NVA) and abnormal visual acuity (AVA) according to standards for nurse diagnosis delivered by Mother and Child Institute, School Medicine Department in 2003 [11,12]. Distribution and structure of this data were similar to results obtained in other studies, including studies done by eye specialists. Taking into account that screening tests (done by nurses) may be interpreted only as a probable diagnosis for a specialist and do not determine this diagnosis, our data and proportions of positive results (AVA) were comparable, although higher, with results of complex studies done by eye specialists. To prove this statement following positions from literature are worth mentioning.

In the year 2001 Muszyńska-Lachota [13] studied 138 children in 7-8 year of age from Westpomeranian region proving that among 7 years old children hyperopia was the dominating refraction error affecting 75% girls and 75.3 % boys. Emmetropia was detected in 11.7% girls and 19.7% boys. Myopia in 3.2% girls and 2.5% boys. Among 8 years old children hyperopia was also a common problem (80.8% girls and 74.1% boys); emmetropia was detected in 12.8% girls and 18.5% boys, astigmatism in 2.1% girls and 3.7% boys. The prevalence of particular refraction errors among both age groups showed no statistically significant difference.

According to Czepita et al. [14,15] study, 5 023 pupils in the age 6-18 years examined in the are of city Szczecin 15% showed myopia. As the study reports the prevalence of myopia follows the age that is: in the group of 6-10 years old children was 1.5-7.8%, in the group between 11-14 years was 10.7-12% and by 15-18 years old children myopia was detected in 22-42% cases. No correlation between the degree of refraction error and sex was reported.

Pechmann et al. [16] reported myopia in about one third of examined population of 6 000 children in age 6-19 years living in Szczecin. Correlation between growing number of children with myopia and the growing duration of education was noticed. It was reported that prevalence of myopia is similar to that in Europe and USA and lower than in Asian countries. It was also proved that genetical and environmental factor played an important role in developing myopia.

According to data from Health Care Statistical Reference Book of Westpomeranian region for year 2002, which was elaborated by Westpomeranian Center of Health Organisation and Promotion [17] from the examined 14 217 children in age of 6 years 7.2% were qualified to active health care, because of refraction errors and eye diseases and respectively 9.3% from the group of 10 years old children (16 294).

Studies done in other countries report diverse prevalence of refraction errors.

Kässmann-Kellner et al. [18] examining uncorrected visual acuity among German children in age 6-7 years (12 192 person) stated that it was lower than 0.7 in 30.8% cases. Lee et al. [19] examining children in age 6-19 reported visual acuity lower than 20/30 without correction in 10.8% white persons and 19.1% Puertoricans in the same age. Myopia was more frequent in children from urban ares in that study. Wender et al. [20] reported impaired visual acuity more than 0.5 in 1.7% of Tanzanian children and youth from rural areas.

Since the year 2003 Poland has been coming through a next variant of health care system reform. According to that, children and youth preventive health care was assigned to:

1. general practitioner; 2. dentist; 3. nurse (school nurse). As a result of this system the only health care representative, responsible also for preventive activity in school is a nurse. Her responsibilities and assignments, among all in the area of pupil's visual acuity anomalies prevention are defined in several law acts, among them Act of Nurse and Midwife Profession together with Ministry of Health regulation about range and description of preventive, diagnostic, treatment and rehabilitation procedures done by a nurse without physician's order [21-24].

Reported visual acuity impairment prevalence among westpomeranian 7-8 years old pupils on the level of 17.7±5%, which imposes the duty of delivering proper information to parents of such children together with directing them to GP or eye specialist, should be also a supportive signal for the need of proper and precise nurse documentation. Namely, the result of physician consultation (GP or eye specialist) should be noted in nurse documentation allowing her to monitor doctor's orders, proper pupils education, eventually their parents, as well as in the range of school as house health care. It seems also that a better cooperation between teachers and school nurse is essential for improving the quality of preventive medicine among pupils. Having the results of physician consultation well documented, a nurse would be able to influence more efficiently adults around children (parents, teachers), focusing them on monitoring doctors orders realization by a child. Taking into account the results of our study, where each age group of examined young children showed consecutive raise of visual acuity anomalies (among 7 years old children 16.9% and 8 years old 18.3%) the need of regular, each year screening tests in that matter as routine nurse calendar procedure seems to be at least reasonable. This should be additionally calculated by National Health Fund as an accessory procedure to nurse duties. Proper and solid perfomance of screening tests, detailed documentation of preventive procedures, delivering high quality preventive care education are very time consuming. Moreover, time of nurse activity should take into account constant monitoring of preventive orders realization together with frequent teachers consultations.

Conclusions

Estimated prevalence of visual acuity anomalies in general population was 17.7±5.0%, 11.3 percentage points higher

from the proportion of pupils with correction glasses. Higher prevalence of vision anomalies was proven to be more frequent respectively in 8 years old children than in 7 years old, girls than boys, children from rural than urban areas. Precision in defining methodical approach in nursing care and procedure standards with respect to the affected pupils will result in improved preventive strategies.

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Changes of lysosomal enzymes activity in the skeletal muscle fibers exposed to endurance exercise

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Abstract

Purpose: To evaluate the effect of endurance exercise on the activity changes of selected lysosomal enzymes in particular types of rat muscle fibers, occurring by 0-4 days following the trial.

Material and methods: The experiment was performed on 3 month old male Wistar rats with body mass 250 ± 25 g, exposed to single physical exercise on moving track (speed 17 m x min^{-1}, decline 0°, duration 87.5 ± 27.5 min). Biochemical analyses were performed on homogenized fast-twitch FTa and FTb (*m. gastrocnemius*) and slow-twitch ST (*m. soleus*) muscle fibers of animals sacrificed 2 h (group II), 6 h (III) or 96 h (IV) after exercise and control group. The measurements considered protein concentration and the activities of beta-glucuronidase (β-GRS), N-acetyl-β-D-glucosaminidase (NAG), and arylsulphatase A (ASA).

Results: In FTa fibers, ASA and β-GRS activities were elevated in all the exercised groups, with the most evident changes in animals tested 96 h post trial (group IV), while the peak of NAG activity was demonstrated 2 h after exercise (group II). In contrast, in FTb and ST fibers the levels of all the enzymes studied peaked 96 h after exercise, following the transient decrease in activity.

Conclusions: The present study demonstrated that maximal running exercise, without the eccentric components, affects the activities of lysosomal enzymes in all types of rat muscular fibers. The lack of uniform activity profile for the lysosomal enzymes studied probably reflects the variety of their cellular functions.

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Key words: lysosomal enzymes, muscles, exercise, rats.

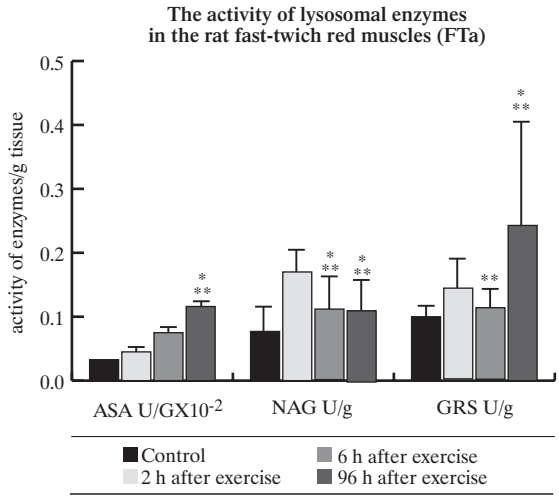
Introduction

It is widely known that physical exercise reflects in the imbalance of homeostasis. The resulting changes depend on the intensity of stimulation and its duration. One of possible exercise-associated consequences is the damage of muscle fibers [1], which might consider either sarcolemma, or myofibrils and cell organelle [2]. Free radicals [3], increased acidification, hypoxia, some metabolites and elevated intracellular Ca^{2+} concentration are mentioned as the factors responsible for those injuries [4,5]. Exercise stress reflects in the changes of protein composition either in cytosol or in plasma membranes and extracellular matrix [6,7].

Lysosomes are the main structures where occurs the degradation of proteins, proteoglycans, mucopolysaccharides, glycoproteins and sulpholipids. They participate in composed, intracellular system decomposing either extra- or intracellular compounds. Lysosomes are present in cells of various tissues, but are particularly frequent in secretive or excretive organs (liver, kidneys, and lungs), enterocytes and leucocytes (mainly granulocytes). In contrast, they are of rare evidence in myocytes and pancreatic glandular vesicles [8]. Lysosomes are intracellular organelles surrounded with single-layered protein-lipid membrane, which, due to specific activity of ATP-dependent proton pump, maintains their internal pH between 5.0 and 5.5. They exhibit the activity of numerous hydrolytic enzymes, including arylsulphatase A (EC 3.1.6.1), catalyzing decomposition of sulphate lipid esters and other sulphconjugates, N-acetyl-beta-D-glucosaminidase (EC 3.2.1.30), splitting off sugar moieties (N-acetylglucosamine) from glycoproteins and glycolipids, and beta-glucuronidase (EC 3.2.1.31) degrading glucosaminoglycanes. The latter one is known as the marker of lysosomes and approved quantitative indicator of muscular damage [9,10].

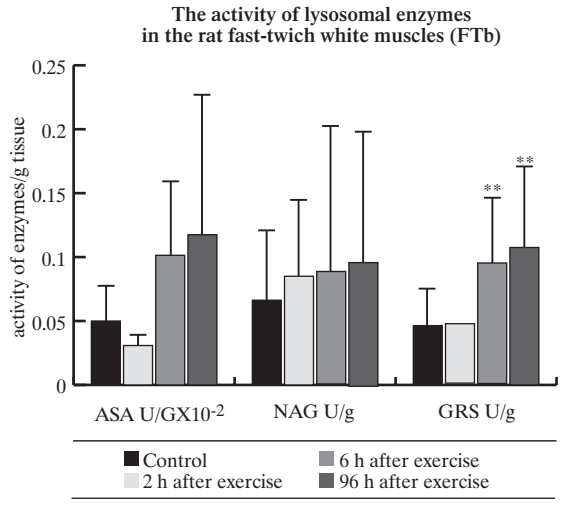
The purpose of present study was to evaluate the effect of

Figure 1. **Lysosomal enzymes activity in FTa fiber muscles. ASA – arylsulfatase A (Uxg^{-1}x10^{-2}), NAG-N-acetyl-β-D-glucosaminidase (Uxg^{-1}), GRS – β-glucuronidase (Uxg^{-1}). Results are means ± SEM from 5 animals**



* p<0.05 (vs control) ** p<0.05 (vs 2 h after exercise)

Figure 2. **Lysosomal enzymes activity in FTb fiber muscles. ASA – arylsulfatase A (Uxg^{-1}x10^{-2}), NAG-N-acetyl-β-D-glucosaminidase (Uxg^{-1}), GRS – β-glucuronidase (Uxg^{-1}). Results are means ± SEM from 5 animals**



* p<0.05 (vs control) ** p<0.05 (vs 2 h after exercise)

endurance exercise on the activity changes of selected lysosomal enzymes in particular types of rat muscle fibers, occurring by 0-4 days following the trial.

Material and methods

The experiment was performed on 3 month old male Wistar rats with body mass 250 ± 25 g. All the animals were kept under the equal microclimatic conditions and given water and standard laboratory fodder ad libidum. The rats were exposed to single physical exercise on moving track (speed 17 m x min^{-1}, decline 0°). The exercise trial was performed "until refuse", which corresponded to average duration 87.5 ± 27.5 min.

The animals were divided into the following groups (n=5):

I – controls – non-exposed to physical exercise,
II – examined 2 h after trial,
III – examined 6 h after trial,
IV – examined 96 h after trial.

The rats were sacrificed by ketamin (Bioketan) injection (100 mg x kg^{-1} b.w.), followed by the dislocation of cervical vertebra. All the procedures were performed according to the guidelines of Local Ethical Commission in Wrocław. The material analyzed considered hind-limb muscles: FTa and FTb fibers dissected from *musculus gastrocnemius*, and ST fibers from *musculus soleus*. The tissues were frozen at -80°C directly post dissection. Prior the biochemical analyses the tissues were homogenized in Potter homogenizer at +4°C, with the solution containing 0.15M NaCl; 0.01M Tris/HCl buffer (pH 7.4), and 0.1% Triton X-100.The homogenates (10% w/v) were subsequently spinned by 8000 x g for 30 min (+4°C) and the supernatant was used for further analyses.

The following analyses were performed on the material studied: 1) protein concentration measured by means of Bradford method [11] with Coomassie Brillant Blue G-250, 2) beta-glucuronidase activity (β-GRS) determined by Maruhn method [12] with p-nitrophenyl-β-D-glucuronide (Sigma), 3) N-acetyl-β--D-glucosaminidase activity (NAG) with p-nitrophenyl-N-acetyl-β-D-glucosaminide (Sigma) [13], 4) arylsulphatase A activity (ASA) by means of Baum method [14] in own modification with 2-hydroxy-5-nitrophenol sulphate (Flucka) as a substrate. The samples were dialyzed to distilled water (+4°C) prior the latter analysis to remove the chloric anions which might alter the enzymatic activity.

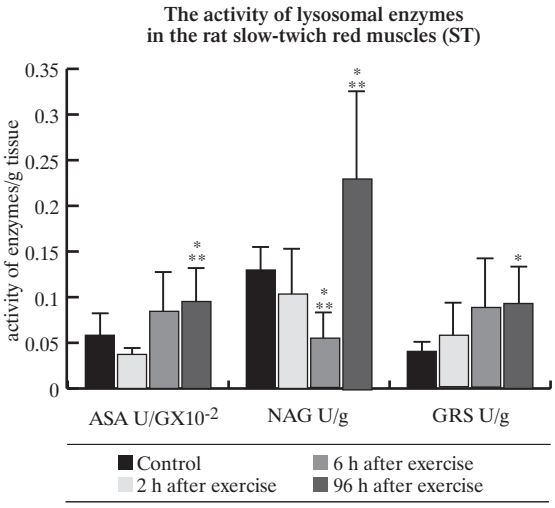
The results of measurements underwent statistical analysis by means Friedman's ANOVA and non-parametric Wilcoxon's test (p<0.05), using Statistica 6.0 PL (StatSoft, Poland) package.

Results

The present study revealed that physical exercise changed lysosomal enzyme activity in all types of muscular fibers. The sequence of that changes was however different in particular experimental groups.

In FTa fibers (*Fig. 1*) ASA activity was elevated in all the exercised groups, with the most evident changes (3.5-fold increase) in animals tested 96 h after trial (group IV). Similar sequence was observed for β-GRS activity, which was also the highest in group IV (2.5-fold increase). However, the nature of NAG changes was different. The peak of activity was demonstrated 2 h after exercise (2-fold increase, p<0.05), while 6 and 96 h post trial the enzyme level remained lower than in group II, but it was still 1.5-fold higher than in the

Figure 3. **Lysosomal enzymes activity in ST fiber muscles. ASA – arylsulfatase A (Uxg^{-1}x10^{-2}), NAG-N-acetyl-β-D-glucosaminidase (Uxg^{-1}) GRS – β-glucuronidase (Uxg^{-1}). Results are means ± SEM from 5 animals**



* p<0.05 (vs control) ** p<0.05 (vs 2 h after exercise)

controls. Enzymatic profile of FTb fibers (*Fig. 2*) was different than described for FTa ones. The activity of ASA in group II was decreased by 44% of the basal level. The most prominent, 2.4-fold, increase was demonstrated in group tested 96 h after exercise. The aforementioned changes were insignificant, however, as well as the alterations of NAG activity, which was also the highest in group IV. Two hours after exercise, the activity of β-GRS in FTb fibers was similar as in the controls, while 2- and 2.3-fold increase was observed 6 and 96 h post trial (group III and IV), respectively ($p<0.05$).

In slow-twitch fibers ST (*Fig. 3*) the decrease of ASA activity by 40% was observed 2 h after exercise (group II), while the increase by 40% and 70% of the basal level was demonstrated in groups III and IV, respectively. The activities of NAG decreased by 17% and 54% of the normal values in groups II and III, respectively. The twofold increase was, however, observed in group IV, when compared with the controls.

Discussion

Present study revealed that the single endurance exercise reflects in the changes of lysosomal enzyme activities in all types of rat muscle fibers. The most pronounced increase of enzymatic values was demonstrated in red, fast-twitch FTa fibers. Most of the authors proved significant effects of eccentric exercise on muscular damage. The lesions were indicated by the increase of enzymatic activity 1-3 days after exercise and the subsequent decrease by 7th day post trial [15-17]. Takala et al. revealed 8-fold increase of muscular β-GRS activity after eccentric exercise, while concentric trial reflected in only 2-fold elevation. Forty-eight hours and 4 days after the electrical stimulation of isolated anterior tibial muscle of rat, the rise of β-GRS activity was 4- and 12-fold, respectively [17]. The eccentric exercise-associated increase of β-GRS level was the most pronounced in red muscle fibers, followed by the white and slow-twitch ones [10].

The present study revealed that the endurance exercise without the eccentric components might cause the similar biochemical changes in muscle fibers, manifested by the highest increase of β-GRS activity in FTa fibers 4 days after exercise. The comparable sequences of NAG and β-GRS, i.e. increase 2 days after endurance test and return to the basal level on day 3, were revealed in biopsy specimen of equine muscle (middle gluteal muscle) [18]. In present study the changes of ASA activity in all the types of muscular fibers followed the similar sequence like in case of β-GRS, and were parallel to described by Kihlström et al. in the muscle of exercise-exposed mice [19]. The elevation of serum ASA activity by 40%, occurring 7 days after exercise, was also demonstrated in sportsmen [20]. It is suggested that exercise-associated peak of lysosomal enzyme activities in muscles might reflect the infiltration of macrophages and granulocytes into the injured tissue and/or result from the activation of endogenous lysosomal system of myocytes [6]. In present study, the peak of NAG activity in fast- and slow-twitch fibers was demonstrated 96 and 2 hours after exercise, respectively. In contrast, Raulo et al. measured the maximal activities of NAG and β-GRS on 3rd day after exercise [18].

The lack of uniform activity profile for the lysosomal enzymes studied probably reflects the variety of their cellular functions. β-GRS and NAG participate in the metabolism of glucosaminoglycanes, which is particularly intensive after exercise [21]. The variations described may also result from changes in the permeability of lysosome membranes and the subsequent selective transport of various compounds. Several factors, including hypoxia, free radical generation or the rise of intracellular Ca^{2+} concentration, might enhance the permeability of lysosomal membranes [22]. Fusion of lysosomes with the plasma membrane and their exocytosis is triggered by elevated intracellular concentration of Ca^{+2} and is required for the repair of cellular disruptions [23]. Lysosomal membranes are in turn stabilized by such hormones as cortisol and ACTH [24]. The transient decrease of ASA activity in FTb and ST fibers observed 2 h after exercise in our study might be the effect of those hormones.

Conclusions

Concluding, the present study demonstrated that maximal running exercise, without the eccentric components, affects the activities of lysosomal enzymes in all types of rat muscular fibers. The lack of uniform activity profile for the lysosomal enzymes studied probably reflects the variety of their cellular functions.

Acknowledgements

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Level of nursing care vs life quality of patients in the terminal stage of a disease

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Abstract

A patient whose treatment has been unsuccessful and a disease still develops enters a terminal stage of the disease which inevitably leads to death. In nursing the evaluation of care quality and measuring its influence on the quality of patients' life have become enormous challenges and are placed among the most crucial issues. The aim of the research is to evaluate the relationship between the quality of nursing services and the life quality of patients in the terminal stage of a disease. The research activities were carried out in five centres of palliative care, 57 nurses and 99 patients in the terminal stage of a disease were involved. The BOHIPSZO method was used to analyse the quality of care, life quality of the patients was measured by means of RSCL – The Rotterdam Symptom Checklist. The material was subject to statistical analysis. The research results show that high level of hospice nursing care positively affects the quality of life in its physical and psychological spheres.

Key words: nursing care quality, quality of life, palliative care.

Introduction

The fundamental aim of palliative care is to maintain the best life quality of patients in the terminal stage of a disease. One of definitions says: 'quality of life – is a degree of material and non-material needs satisfaction of individual persons, families and communities' – it combines a material and non-material subjective approach to the idea of satisfying needs [1]. In 1990 Schipper introduced a new, precise definition of QL, suitable for medical purposes: HRQL – Health Related Quality of Life, which comprises four spheres of existence: physical state, locomotion efficiency, psychological state, social status and economic condition, somatic sensations [2]. Terminal stage – the last in a disease usually lasts 4-6 weeks. What's typical of this stage is a marked irreversible deterioration of a general condition and a restriction of locomotion efficiency. This disease stage requires particular care about a proper symptom control and a general life quality improvement [3]. A patient – nurse relationship plays the main role in palliative care. Three concepts of such a relationship are given by Muetzel (1988). According to him, intimacy and reciprocation between a patent and a nurse coexist during a therapy. Muetzel also believes that a nurse has to be aware of, or at least open to such a substantial relationship to develop [4]. What is more, as claimed by Watson (1988), such a 'caring' relationship establishes when a patient is treated by a nurse as an individual, when a nurse is also able to develop and strengthen this mutual contact [5]. Campbell (1984), a theologian, compares such a nurse–patient relationship to a journey. Two people are travelling together for some time, they are getting closer and closer, make contact, yet with certain restrictions. At the end of the journey they separate without a deep personal relationship; this is called 'moderated love' [6]. Nursing care does not include merely technical and manual procedures, but also involves a huge area of interpersonal relations, individual psychotherapeutic and educational effect or the support system.

Material and methods

The aim of the research is the evaluation of the relationship between the quality of nursing services and life quality of patients in the terminal stage of a disease. The research was

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Table 1. **Nursing care level**

No	Group	Real value	Nursing care coefficient
1.	Ward	6.08	97.06%
2.	Hospice	35.30	83.40%
3.	Ward	54.20	74.70%
4.	Hospice	6.42	96.93%
5.	Hospice	7.53	96.43%

carried out in five hospices and/or palliative care wards located in the following provinces: Pomorskie, Warmińsko-Mazurskie and Kujawsko-Pomorskie. The research involved 57 nurses and 99 patients in the terminal stage. The BOHIPSZO method was used for the evaluation of the quality of nursing services since it involved an individual care analysis of each patient based on 240 criteria. Patients' life quality evaluation was performed by means of RSCL – The Rotterdam Symptom Checklist – specially modified to deal with patients in the terminal stage of a disease. The method was based on four meetings with a patient. Statistical analysis was made with the use of STATISTCA PL package [7], whereas statistical reasoning – by means of a multi-variable analysis. The analysis of variance (ANOVA) with repeated measurements according to the following model: group time of examination was use for life quality analysis based on the RSCL scale. The analysis of dependence between pairs of variables was carried out by means of a linear correlation coefficient according to r-Pearson product moment [8].

Results

The highest nursing care level was observed in the first unit – 6.08 points in real numbers (the closer a number to '0', the better nursing care) and 97.06% in interests (the closer to 100% – the better care), the lowest nursing care level was observed in the third unit (*Tab. 1*).

As results from the information presented in *Fig. 1* – the examination time is significant since it makes the results differ in subsequent time points of life quality evaluations concerning the physical sphere ($p<0.001$). The second and third examination after being taken to a hospice indicate a considerable and statistically significant improvement in a physical sphere RSCL as compared to the initial examination. Nevertheless, due to progressing deterioration of patients' condition as well as the exacerbation of somatic symptoms, life quality significantly decreases again in the final examination (*Fig. 2*).

At a stated level of significance – 0.05, no significant group effect has been observed, which means that in a physical sphere RSCL a variety of life quality mean values concerning the aspect of the analysed group affiliation has not been confirmed. The only thing noticed was a tendency ($p<0.1$) for patients from the third group to show greater exacerbation of somatic symptoms.

What is presented in *Fig. 3* is the fact that the examination time effect is crucial for the existence of various results of the subsequent examinations evaluating life quality in a psychological sphere ($p<0.001$). In the second and third examination, in comparison to the first one, a considerable and statistically significant improvement in the psychological sphere RSCL was observed. The life quality deteriorating in the psychological

Figure 1. **The mean value of the physical sphere RSCL – examination time effect**

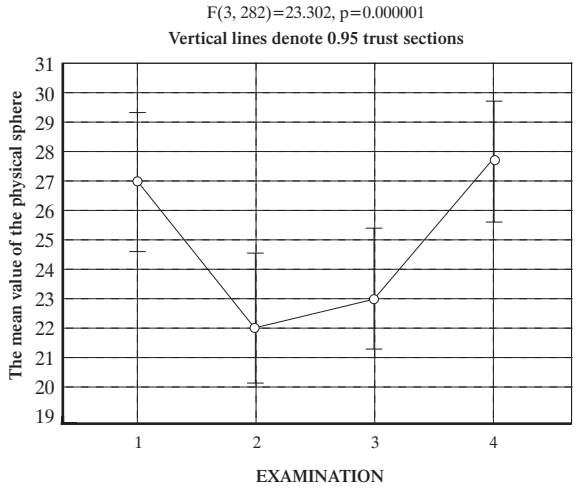

Figure 2. **The mean value of the physical sphere RSCL – group affiliation effect**

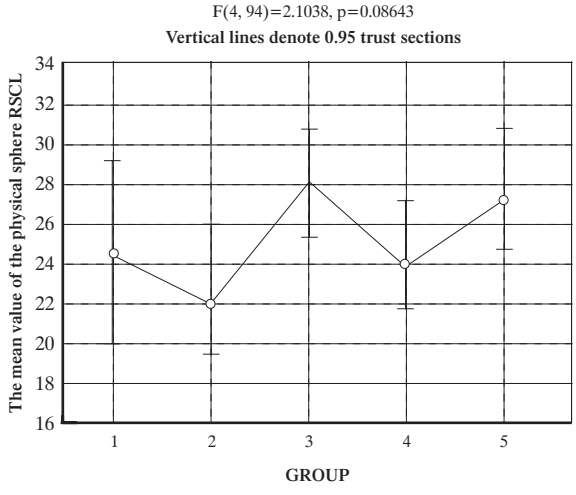

Figure 3. **The mean value of the psychological sphere RSCL – examination time effect**

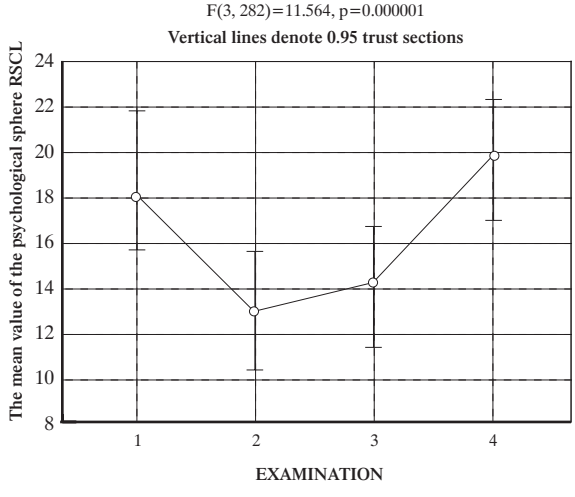

Table 2. **The dependence correlation between nursing care quality and the quality of life in the physical sphere in the 3rd and 4th examinations and the quality of life in the psychological sphere in the 4th examination**

N=99	QL PHYS. 3	QL PHYS. 4	QL PSYCH. 4
Quality of nursing care	r=-0.289 p<0.05	r=-0.236 p<0.05	r=-0.173 p<0.1

sphere in the fourth examination results from a simultaneous exacerbation of somatic symptoms (*Tab. 2*).

The examination was based on an individual evaluation of life and nursing care quality of each patient in the n=99 attempt. Statistical analysis was based on r-Pearson's correlation coefficient. The results obtained in the third an fourth examinations indicate there exists a dependence between nursing care quality and the level of patients' life quality in the terminal stage of a disease in the physical sphere ($p<0.05$), and the psychological sphere in the fourth examination ($p<0.1$).

Discussion

Patients in the terminal stage of a disease – this is a very specific group of patients in which the form of care plays one of the most significant roles in the obtained effects on their life quality. Quality studies realised in palliative care by numerous researchers around the world are still developing. While making the research analysis in this area O'Hendley (1997) stated: 'despite the striking development of palliative care, the effectiveness of research results is still limited' [9]. The causes of an insufficient number of studies confirming high quality of nursing services in palliative care are not the antipathy or nurses' unwillingness towards their professional activities being assessed, but practical and ethical difficulties in performing such an assessment. The analysis carried out in this research made it possible to evaluate the level of nursing care quality of palliative care with patients in the terminal stage. This evaluation shows that in four units the quality of nursing care is high and only in one unit, the third one, nursing care is at the level of 74.7%, with 100% being the maximum result. The above situation indicates the fact of patients' needs being not satisfied in over 25% of the required nursing care. Also, patients' quality of life concerning four main spheres: physical, psychological, locomotion activity and a general quality of life was evaluated. In the quality of life analysis, the examination time effect is extremely significant for varying the results in the subsequent time points ($p<0.001$) of evaluations, in all spheres of life quality in the case of patients in the terminal stage. These results confirmed the research studies carried out earlier by various scientists [3,10]. In physical and psychological RSCL spheres, it is possible to observe in the second and third examination a considerable and statistically significant improvement ($p<0.001$) as compared to the initial examination. However, because of a progressing disease, quality of patients' life in the spheres mentioned above becomes lower again in the final examination. The subsequent examinations indicate a gradual deterioration of the quality of life in the spheres of locomotion activity and a general quality of patients' life ($p<0.001$) in the situation when somatic symptoms inevitably exacerbate, patients' activity decreases – it is obvious and understandable that the evaluation of a general quality of life will produce less and less positive results. What was also noticed was a tendency ($p<0.1$) of the lower quality of life in the physical sphere in a group of patients where the quality of nursing care was at the lowest level (74,7%). It seems clear that there is no confirmation of a dependence between the quality of nursing care and the spheres of locomotion activity and a general quality of life. Gradually progressing disease irreversibly impairs patients' locomotion activity, which influences more and more negative patients' evaluation of life quality, even if the quality of nursing care is high. The evaluation of a general quality of life is the most subjective one, to a great extent resulting from patients' individual experiences. Also, patients' age or a basic disease type may become a dependant factor. Research results of Modlińska (2000) indicate that the most negative results of life quality evaluation are observed in the case of young people with terminal cancer, better results are obtained in the case of elderly people. General QL is evaluated in the most positive way by elderly people not suffering from cancer [11].

Conclusions

1. The analysis of r-Pearson linear correlation between the quality of nursing care and the quality of life in the case of patients in the terminal stage of a disease indicates that high level of nursing care in hospices influences better quality of patients' life in the physical and psychological spheres.
2. The improvement of patents' life quality in the psychical sphere can be observed after two weeks, and in the psychological sphere after the third week of hospitalisation.

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Endothelin receptor antagonism – new perspectives in the treatment of systemic sclerosis

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Abstract

Endothelin-1 is a naturally occurring polypeptide which possesses a broad range of activities including vasospastic, proinflammatory and profibrotic properties. Systemic sclerosis is a multisystem connective tissue disease characterized by vascular damage, inflammatory infiltrates and progressive fibrosis of the skin and internal organs. The results of the recent studies indicate that endothelin-1 may be a key element of the pathogenesis of systemic sclerosis. Accordingly, new class of drugs, endothelin receptor antagonists have been introduced for treatment of patients with systemic sclerosis.

This article reviews the role of endothelin-1 in the pathogenesis of systemic sclerosis and the implications of endothelin receptor antagonism in the treatment of systemic sclerosis.

Key words: endothelin, endothelin receptor antagonism, systemic sclerosis.

Endothelin-1 in systemic sclerosis

Endothelin-1 (ET1) is a naturally occurring 21-aminoacid polypeptide [1,2]. ET1 was first identified in 1988 by a group of Japanese investigators as a product of endothelial cells [1,2].

ET1 possesses a broad range of biological activities. It is considered one of the most potent vasoconstrictors known [2]. ET1 is also involved in the proliferation of fibroblasts and smooth muscle cells through direct stimulation or potentialization of the effects of other growth factors. It has also been shown to stimulate fibroblast chemotaxis and induce extracellular matrix synthesis [2-5]. Recently, Shi-Wen et al. showed, that ET1 induces myofibroblast phenotype in cultured human fibroblasts [6]. Myofibroblasts, characterized by the expression of α-actin and higher collagen production are considered to be key cells responsible for the pathogenesis of fibrotic conditions such as systemic sclerosis (SSc) or pulmonary fibrosis. Finally, ET1 is also involved in the inflammatory response since it stimulates monocytes and neutrophils [1,7].

ET1 is involved in many physiological processes such as development of respiratory system, and cardiovascular homeostasis. Recently, ET1 has been implicated in the pathogenesis of several diseases [1].

SSc is a multisystem disease characterized by vascular changes, local inflammatory infiltrates and progressive fibrosis of the skin and internal organs. Vascular changes characteristic for SSc include Raynaud phenomenon, capillary angiopathy, ischemic ulcers and pulmonary arterial hypertension [8]. The latter one is considered to be the most fatal complication of SSc [9,10]. Scleroderma related interstitial lung disease, known also as pulmonary fibrosis or scleroderma related fibrosing alveolitis is another frequent and severe complication of SSc [11]. Unfortunately, there are no effective treatments for SSc patients so far, and the drugs that were shown to be of any therapeutic effect are very toxic.

It has been shown that ET1 levels are increased in patients with SSc compared to healthy controls. Interestingly, plasma/serum ET1 levels were shown to be higher in patients with diffuse cutaneous SSc compared to those with limited cutaneous SSc, and higher in SSc patients with fibrotic skin and lung changes compared to those without [1,12,13]. Elevated ET1 levels were also reported in bronchoalveolar lavage (BAL) fluid from patients with SSc and breath condensate from patients with interstitial lung diseases including these with scleroderma related fibrosing alveolitis [14-16]. In the study by Cambrey et

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al. ET1 was responsible for approximately 40% of BAL fluid mitogenic activity for fibroblasts [14]. It has also been shown that ET1 is overexpressed in the skin and the lungs of patients with SSc compared with healthy controls [17,18]. In vitro studies showed that fibroblasts cultured from patients with SSc display enhanced ET1 expression [19]. Accordingly, exposure of normal human fibroblasts to ET1 caused phenotypic changes typical for SSc-derived fibroblasts [3,6].

Endothelin-1 receptors

There are two separate ET1 receptors identified: ETA and ETB. Both receptors belong to the superfamily of 7-transmembrane G-protein-coupled receptors but can mediate different, sometimes opposing, effects. ETA and ETB show tissue-specific pattern of expression [1,2]. ETA receptors are abundantly expressed on the vascular smooth muscle cells, where they are responsible for the vasoconstictive action of ET1. ETB receptors are also found on the vascular smooth muscle cells where they produce vasoconstriction. However, ETB receptor expressed on endothelial cells stimulate production of vasodilatatory compounds, such as prostacyclin and nitric oxide and mediate endothelium-dependent vascular relaxation [1,2].

Both ETA and ETB receptor were shown to be involved in the ET1-mediated cell proliferation. Experimental data indicate that ETB receptor is responsible for profibrotic and pro-inflammatory effects of ET1 [2].

It has also been shown that expression of ET1 receptors is dysregulated during different disease states. Expression of ETA receptor was reduced in SSc fibroblasts by 50% [3]. Similarly, ETA expression was shown to be significantly reduced and ETB upregulated in SSc associated lung fibrosis when compared with healthy lung [18]. Endothelial ETB receptors are downregulated in diseases associated with endothelial dysfunction whereas intimal, smooth muscle ETB receptors are up-regulated in several vascular diseases including pulmonary arterial hypertension [2].

Endothelin receptor antagonists (ERAs) – new perspective in the treatment of patients with systemic sclerosis

Discovery of ET1 receptors allowed ET receptor antagonists (ERA) to be developed. Bosentan, which is orally active, dual (nonselective) ET receptor antagonist, was the first ERA tested in clinical trials. The results of two double-blind, placebo-controlled clinical trials (study 351 and BREATH-1) showed that bosentan significantly improved exercise capacity and cardiopulmonary hemodynamics in patients with pulmonary arterial hypertension (PAH) compared to placebo [20-22]. Since PAH is relatively frequent complication of SSc, the above mentioned clinical trials included also patients with SSc-related PAH, 52 altogether (37 in bosentan arm and 15 in placebo arm of the study). Analysis of patients with SSc-related PAH revealed that overall effect was comparable to that seen in idiopathic PAH, however, beneficial effect of bosentan seen in patients with SSc-related PAH was mainly due to stabilization rather than improvement of their functional status. Accordingly, patients with SSc-related PAH who received placebo deteriorated during the study time [23]. It is known, that patients with SSc-related PAH had worse outcome than those with primary PAH [9].

The results of the above mentioned clinical studies allowed bosentan to be registered in the USA and European Union for treatment of severe PAH including SSc-related PAH. The advantages of bosentan is its oral administration as well as relatively lower treatment costs when compared to continues infusion of prostacyclin. This was the reason that the recent evidence-based treatment algorithm in pulmonary arterial hypertension mention bosentan as first-choice drug in patients with severe PAH, non-responding to acute vasodilatation [24].

Recently, a new selective ETA receptor antagonist, Sitaxsentan is under study in clinical trials with very promising clinical effects [25].

Another common manifestation of vascular disease in SSc patients are ischemic digital ulcers which cause pain and hand function impairment. The RAPIDS-1 study (Randomized, Placebo-Controlled Study on the Prevention of Ischemic Digital Ulcers secondary to systemic Sclerosis) was a double-blind placebo-controlled study designed to investigate the effect of bosentan in preventing ischemic digital ulcers in SSc patients. Bosentan significantly reduced the number of new ulcers, particularly in the high risk patients with digital ulcers at baseline. In patients receiving bosentan, a statistically significant improvement in hand function was also observed. However, there was no difference observed in the healing of existing ulcers between patients receiving bosentan and those receiving placebo [26].

Since there is evidence showing that ET1 may be involved in the pathogenesis of interstitial lung diseases, there are another clinical trials under way. BUILT-1 and BUILT-2 studies were designed to investigate clinical effects of bosentan in patients with idiopathic pulmonary fibrosis and SSc-retaled interstitial lung diseases, respectively. The first results of BUILT-2 trial are expected in the year of 2006. However, there are anecdotal reports showing improvement of skin fibrosis in SSc patients treated with bosentan [27].

Conclusions

In summary, ERAs are a new class of drugs which had already been proved to be effective in the treatment of vascular complications of SSc. There is hope that they may also be helpful in treating fibrotic complication of SSc. However, there is still a lot to be learnt about long-term effect and safety of these new drugs in SSc patients.

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Kidney crisis in systemic sclerosis

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Abstract

Renal crisis in systemic sclerosis occurs in the group of patients with rapid and aggressive course of the disease, often after several years of the ailment and with the diffuse form. Scleroderma renal crisis (SRC) is most frequently characterized by malignant hypertension, renal insufficiency, and less often by the symptoms of microangiopathic hemolytic anemia. Renal crisis symptoms appear suddenly and are not usually preceded by significant prodromal symptoms. SRC is always life-threatening and requires specific treatment with drugs blocking angiotensin-converting enzyme. Early diagnosis and introducing appropriate treatment give a patient a chance to survive SRC episode and improve his prognosis. SRC is of great importance to clinicians as it still causes high mortality rate.

Chronic and subacute renal crisis is connected with a small risk of acute renal failure. However, it gradually leads to a substantial dysfunction of this organ. Thus, a useful examination in the diagnostics of chronic renal crisis is checking the vascular flow in renal cortex and evaluating intrarenal resistance.

Key words: kidney, scleroderma renal crisis, systemic sclerosis.

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Introduction

Systemic sclerosis is the connective tissue systemic disease of unknown etiology and multiorgan localization. It is characterized by immunological disorders, inflammatory damage of vascular endothelium, skin fibrosis and hardening, and internal organ functioning impairment. The skin, the osteoarticular system, cardiovascular system, respiratory system, the digestive tract, kidneys, and the nervous system are the tissues and organs most frequently affected in the course of the disease. Internal organs are usually influenced in the first years of the disease and the localization of the changes and their intensity have the impact on the course and prognosis of the disease.

The kidneys affected in the course of the systemic sclerosis were reported for the first time in 1863 [1]. During the next century, numerous observations concerning the disease proved the mortality of patients with the systemic sclerosis with nephropathic symptoms to be significantly higher comparing patients without kidney failure. In 1952, Moore and Sheehan claimed the renal damage to be the main cause of death of patients with the systemic sclerosis and presented the first description of the so-called scleroderma renal crisis (SRC) [1]. Introducing drugs blocking angiotensin-converting enzyme (ACE) was the turning-point in the history of diagnostics and therapy of patients with the systemic sclerosis [2]. During 20 years of observation of patients treated with ACE inhibitors it was stated that the rate of SCR episodes diminished.

Sudden renal episodes are not the only problem of rheumatologists and nephrologists. Patients with systemic sclerosis are exposed to chronic and progressive renal damage, which can lead to renal failure. So far, the pathogenesis of renal changes in systemic sclerosis, both acute and chronic, has not been known. The study concerns the pathogenesis, clinical symptoms, laboratory tests, therapy, and distant effects of SRC in patients with systemic sclerosis.

Pathogenesis

The primary site of kidney damage is the internal membrane of a blood vessel where thinning and proliferation and, at the later stages, vessel occlusion occur. The process concerns mainly intralobular and arched vessels, i.e. renal cortex. It is assumed that an unknown etiological factor leads to endothelial damage and blood platelets appear as the first at the site of damage. Then, inflammatory cells (lymphocytes and macrophages) stimulate, producing proinflammatory cytokines, inflow of other cells, typical for inflammation. Selectins (V-CAM, I-CAM) and adhesins, proinflammatory factors secreted by the vascular epithelium, have also a great impact [3].

A trigger factor – an inflammatory process initiator – is not certain. Cannon has observed that the vascular spasm in a mechanism resembling Raynaud's symptom occurs in 75% of patients with SRC and leads to a significant decrease in renal blood flow [4]. Kovalchik et al. showed that hyperreninemia occurs in patients with systemic sclerosis without affecting the kidneys always after exposition to cold. However, during a 10-year prospective observation of 57 patients with systemic sclerosis and elevated renin concentration, none of the patients complained of the acute renal episode [5]. The vessel damage is a phenomenon, which is always present in patients with systemic sclerosis but does not coexist with SRC. In post mortem examinations, vascular endothelial damage in cases of systemic sclerosis with developed SRC was comparable to the cases without SRC.

SRC – clinical and laboratory symptoms. Definition and occurrence rate

SRC is defined as a newly ensuing malignant arterial hypertension and/or rapidly progressing renal failure with oliguria in patients with systemic sclerosis. Benign arterial hypertension in patients suffering from systemic sclerosis with elevated parameters of renal efficiency is not described as SRC [6].

The occurrence rate is estimated to be 10% of all systemic sclerosis cases. A higher risk of renal crisis can be found in patients with diffuse systemic sclerosis and reaches 20-25% in this group of patients [7]. Out of all SRC episodes, 75% occurs in the early stage of the disease, i.e. in the first 4 years after the diagnosis [8]. The symptoms are found significantly more frequently in men and the black race [9]. Predisposing factors are: the black race, the diffuse form of systemic sclerosis, rapidly occurring process of skin thinning, the disease duration up to 4 years, anti-RNA polymerase III antibodies [10], symptoms of new anemia without a clear cause, proteinuria >250 mg/d, new cardiac episodes (pericarditis, circulatory failure), and large doses of corticosteroids [11]. Other factors, also inducing symptoms, leading to SRC can be: pregnancy (hormonal changes) [12], sepsis, any clinical situation leading to dehydration (decrease in renal blood flow), any situation in the organism which causes contraction of arterioles supplying periglomerular apparatus and drugs (e.g. Ca-blockers – decrease in renal blood flow), non-steroid anti-inflammatory drugs (prostaglandin production decrease, lack of their vasodilative function), and small doses of steroids [13]. As far as the last group is concerned, there is no proof of their causative functions in development of SRC; some authors even used them to treat the disease. However, as they inhibit prostacycline production, they can have undesirable effect.

On the other hand, such factors as earlier history of hypertension, abnormal results of urine sediments, elevated creatinine concentration in blood serum, increased renin activity in blood serum, pathological picture/image of renal vessels, and antibodies SCL-70 and ACA do not influence SRC occurrence rate.

Clinical symptoms of SRC

The clinical symptoms of scleroderma renal crisis are not characteristic, specifically in its early stage. These are: fatigue, effort-rest dyspnoea, and headaches. On subjective examination, growing hypertension (which exceeds 150/90 mmHg in 90% of patients while in 30% diastolic pressure is more than 120 mmHg) seems to be important. It should be also taken into consideration that in the early stage of the disease, 50% of patients do not reveal full SRC clinical symptoms and 10% with SRC have normal blood pressure [14]. There are also clinical symptoms that are rare but specific. These are: rapidly growing hyperazotemia with no apparent cause, microangiopathic hemolytic anemia, pulmonary hemorrhage, thrombocytopenia, and neurological disorders. The presence of the symptoms requires careful observation and determination of SRC occurrence.

Cardiologic symptoms are decisive as for survival of a patient with acute renal episode. They are usually conditioned by kidneys status and blood pressure and disappear after the pressure compensation. Most severe and frequent symptoms are circulatory insufficiency, pulmonary edema, pericardial and peritoneal exudates [15].

There are laboratory tests useful in the diagnostics of acute renal episodes:

1. Renal parameters:
   - proteinuria (up to 2.5 g/24 hours)
   - erythrocyturia
   - hyaline casts in sediment
   - growing creatinine concentration in blood serum (0.5--1.0 mg/dl/24 hours) – regardless hypotensive therapy introduction
   - elevation of renin activity of blood plasma;
2. Hematologic parameters:
   - microangiopathic hemolytic anemia – normochromic anemia with fragmented red blood cells, elevated reticulocytic values and thrombocytopenia.

Other forms of affected kidneys in systemic sclerosis

Besides the acute form of SRC, there are two others, which can occur in the course of systemic sclerosis: subacute and chronic ones. The chronic SRC is asymptomatic and is characterized by a slight proteinuria, renal filtration lowering, and elevated resistance indices/coefficients in renal vessels. This form is relatively frequent, according to some investigators it can occur in 40-50% of all patients with systemic sclerosis [16].

The subacute form, with occurrence rate of 10-25%, is characterized by overt proteinuria, hypertension or normotension, and creatinine clearance decrease. Hypertension, proteinuria, and hyperazotemia can be also present. However, the course is mostly asymptomatic. The clinical picture can be disturbed by immunomodulating therapy (D-penicylamine, which causes proteinuria due to membranous glomerulonephritis). Coexisting diseases of the genitourinary system may often intensify renal changes. The diagnostics based on kidney Doppler analysis, and specifically the evaluation of intravascular resistance in the renal cortex enables precise differentiation of the clinical conditions mentioned above.

SRC treatment

In 1970s, ACE-I was used to treat SRC for the first time. A so-called blockade of the erroneous path was administered by Lopez-Ovejero in Pittsburgh in 1979 [2]. The effects of the therapy were surprisingly high, not mentioning their influence on the prophylaxis of renal complications. After ACE-I treatment 55% of patients with SRC revealed renal parameter and blood pressure normalization. Unfortunately, 15% of patients die despite introducing the therapy. According to Whitman, a significant factor limiting ACE-I application is creatinine concentration in blood serum exceeding 4 mg% [17]. In such cases, isolated ACE-I treatment did not show any improvement. Dialysotherapy proved to be successful in patients with SRC and its combination with ACE-I should be conducted for 6-12 months to avoid hyperreninemia and hyperazotemia recurrences. Blood pressure should be maintained at the level of 120-140/70-90 mmHg and ACE-I doses modified every 6-12 hours dependent on the pressure. If blood pressure values are not lowered using ACE-I treatment Ca-blockers, hydralazine, minoxidil, and sodium nitroprusside can be added [18].

Prognosis

At present, 76% of patients with SRC live for one year comparing 15% in the past. SRC prognosis is similar to that of diffuse systemic sclerosis. There is no doubt that ACE blockers have been the turning point in systemic sclerosis therapy, renal therapy and prophylaxis [19].

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The occurrence of pulmonary hypertension in patients with systemic sclerosis hospitalized in The Department of Rheumatology and Internal Diseases Medical University of Białystok in years 2003-2004

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Abstract

Pulmonary hypertension (PH) is one the most fatal complications of systemic sclerosis (SSc). The aim of the present study was to investigate the occurrence of PH in SSc patients hospitalized in Department of Rheumatology and Internal Diseases University Hospital of Białystok in years 2003-2004. PH was defined as pulmonary artery systolic pressure (PASP) higher than 35 mmHg as evaluated by ECHO-Doppler.

We found PH in 23 out of 53 (43%) SSc patients included in the study. In the majority of patients 20/23 (87%) PH coexisted with the presence of scleroderma lung disease as evaluated by high resolution computed tomography of the lungs. In the remaining 3/23 (13%) patients isolated (arterial) PH was detected. Patients with isolated PH tend to have higher values of PASP (82±39.0 mmHg) than those with PH and interstitial lung disease (42.5±6.4 mmHg).

The results of our study indicate that PH is a frequent complication of SSc.

Key words: systemic sclerosis, pulmonary hypertension.

Introduction

Systemic sclerosis (SSc) is a systemic connective tissue disease of unknown etiology. It is characterized by immune disturbances, blood vessel and endothelium damage, as well as skin and internal organ fibrosis. The skin, the osteoarticular, cardiovascular, respiratory, and digestive systems as well as the kidneys and the nervous system are affected. The disease is chronic and progressive. The kind of the internal organ involvement decides of the course of the disease and the fate of the patient. So far, no drugs modifying the course of the disease have been found [1].

Clinically, there are diffuse systemic sclerosis (dSS) and limited systemic sclerosis (lSS) – earlier known as CREST (Calcinosis, Raynaud's phenomenon, Esophageal dysmotility, Sclerodactyly, Telangiectasia) distinguished.

One of the most serious organ complications in the course of the SSc is the pulmonary hypertension (PH), which significantly increases mortality rate among the patients.

As far as pathogenesis is concerned, patients with the SSc reveal arterial PH, known also as isolated PH, which is characterized by obliterative changes of pulmonary arteries and forms of secondary PH. The latter may occur due to lung parenchyma damage in the course of the interstitial lung disease (lung fibrosis), left ventricular failure or thrombo-embolic changes [2,3].

Arterial PH usually concerns patients with limited SSc. It appears after a prolonged duration of the disease and is a result of the narrowing of pulmonary arteries. The appearance of the right heart failure (cor pulmonale) in patients with limited SSc correlates with nRNP antibody presence in serum. The rate of isolated PH occurrence is approximately 10-15% of patients [4,5,6].

Secondary pulmonary hypertension develops most frequently due to interstitial lung fibrosis and can occur in both diffuse and limited forms of the SSc. The former reveals interstitial pulmonary fibrosis and PH already in the early stage of the disease. PH is secondary to interstitial pulmonary fibrosis as a result of damage of lung tissues supporting blood vessels as well as the destruction of the vessels themselves. Hypoxia additionally strengthens hypertension due to reflex blood vessel contraction. According to various data, secondary pulmonary hypertension concerns more than 50% of patients with SSc [4,6].

Raynaud's pulmonary phenomenon is also taken into consideration in the pathogenesis of the pulmonary hypertension.

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Patients with the SSc often present ischemic heart disease and myocardial perfusion disorders that can contribute to the left-sided heart failure and subsequent increase in the pressure in the lung vasculature [3].

The aim of our study was to evaluate pulmonary hypertension occurrence rate in patients with SSc hospitalized in The Department of Rheumatology and Internal Diseases, Medical University of Białystok in years 2003-2004. Moreover, we attempted to determine clinical characteristics of patients with PH in the course of SSc.

Material and methods

The study was conducted in the group of 53 patients with diagnosed SSc, based on ARA classification criteria of 1980 [7], hospitalized in The Department of Rheumatology and Internal Diseases, University Hospital of Białystok in years 2003-2004. The clinical evaluation included sex, age, disease duration, disease subset, high resolution computed tomography (HRCT) of the lungs, pulmonary function tests and Doppler-echocardiography (ECHO). The patients were divided into 2 groups: those with the limited form of SSc and those with the diffuse one. All patients underwent serological examinations.

The indirect immunofluorescence test for antinuclear antibodies (ANA) and anticentromere antibodies (ACA) was performed and the presence of antibodies against topoisomerase I (anti-Scl-70) was evaluated with ELISA method. Patients' physical efficiency was assessed with the 6-minute-walk test. The pulmonary function tests (spirometry) were done in all patients. The presence of the interstitial lung disease was evaluated on the basis of HRCT of the lungs. Changes in lung tissue, visible in radiograms, were classified as without fibrotic features – the presence of so-called "ground glass" and as advanced fibrosis – the presence of so-called "honey combing" [8].

Pulmonary hypertension was evaluated using Doppler-echocardiography (ECHO). The examination was performed in a typical way, according to The American Society of Echocardiography instructions, with the apparatus Sonos 5500 using transthoracic transducer with a harmonic resolution 1.6-3.2 MHz. The systolic pressure in the pulmonary artery (pulmonary artery systolic pressure, PASP) was assessed based on the measurement of the maximum speed of the recoil wave of the tricuspid valve insufficiency. Then, the gradient of right ventricle/right atrium systolic pressure was calculated in the Bernoulli equation. The systolic pressure in the right ventricle, which is equal to the systolic pressure in the pulmonary artery (with lack of the pulmonary artery valvular stenosis), was calculated by adding the gradient value to the value of the right atrium pressure. The values above 35 mmHg of the PASP denoted the pulmonary hypertension (according to WHO) [9].

Statistical analysis

Statistical analysis was performed using the Mann-Whitney U test and the Fisher's exact test. P values less than 0.05 were considered statistically significant.

Table 1. **Clinical characteristics of the patients with systemic sclerosis**

Sex F/M no. (%)		51\2	(97/3)
Patients age (years) *		51 ± 14	
Disease duration (years)*		13 ± 10	
Disease subset	dSSc no. (%)	15	(28)
	lSSc no. (%)	38	(72)
PH(+)/PH (–) no. (%)		23/30	(43/57)
HRCT(+)/HRCT(–) no. (%)		35/18	(66/34)
ANA(+) no. (%)		53	(100)
Scl-70(+)/Scl-70(–) no. (%)		22/31	(41/59)
ACA(+)/ACA(–) no. (%)		8/45	(15/85)
HRCT(+) ground glass no. (%)		11	(20)
HRCT(+) honey combing no. (%)		24	(45)

* values are expressed as mean ±SD
HRCT(+)=high resolution computed tomography findings consistent with SLD; SLD=scleroderma lung disease; PH=pulmonary hypertension; ANA=antinuclear antibodies; anti-Scl-70=anti-topoisomerase I antibodies; ACA=anticentromere antibodies; lSSc – limited systemic sclerosis; dSSc – diffuse systemic sclerosis

Results

In the whole group of 53 patients with SSc, the PH was diagnosed in 23 (43%) patients while the remaining 30 (57%) patients did not present features of the PH.

Twenty out of 53 SSc patients revealed the PH coexisting with the interstitial pneumonia confirmed by the HRCT examination. The presence of the PH without coexisting interstitial pneumonia and hemodynamically significant left ventricle insufficiency was observed in 3/53 (6%) patients. Thus, the isolated PH was diagnosed in those patients.

Altogether, 35 out of 53 SSc patients had features of interstitial lung disease in the HRCT. In the whole group of SSc patients "ground glass" changes only were seen in the HRCT examination in 11 patients while the remaining 24 patients presented features of lung fibrosis.

HRCT revealed features of interstitial lung disease in 15/30 (50%) patients without the PH. The remaining 15/30 patients without PH had no changes in the HRCT.

Antinuclear antibodies (ANA) were found in all SSc patients and 22 (41%) patients had anti-topoisomerase I antibodies (anti-Scl-70). ACA were present in 8 (15%) patients, all with the diagnosed limited form of SSc. *Tab. 1* shows the general characteristics of 53 examined patients.

The mean duration of the disease in a group of 20 patients with PH and interstitial lung disease was 15±10 years with the mean age of the patients 55±12 years. Clinical evaluation of the physical efficiency based on the 6-min-walk test in that group of patients was mean 353±143 meters. The mean value of PASP in these subjects was 42.5±6.4 mmHg while their forced vital capacity (FVC) was 78.4±13.6% of predicted. Anti-Scl-70 antibody presence was observed in 11 out of 20 patients (55%) and ACA – only in 1 patient (5%).

Eleven patients out of 20 (55%) with the PH and interstitial

Table 2. **Comparison of of patients with and without PH**

		PH(+), HRCT(+)		PH(+), HRCT(–)		PH(–)	
Number of patients (%)		20	(37)	3	(6)	30	(57)
Age (years) *		55±12		53±11		49±15	
Disease duration (years) *		15±10		17±7		12±9	
6-min-walk test (meters) *		353±143		212±207		428±102	
PASP (mmHg) *		42.5±6.4		82.0±39.0		(N=3) 32.0±1.7	
FVC (% of predicted) *		78.4±13.6		92.0±15.6		92.0±15.8	
ANA no. (%)		20	(100)	3	(100)	30	(100)
Scl-70(+)/Scl-70(–) no. (%)		11/9	(55/45)	0	0	10/20	(33/67)
ACA(+)/ACA(–) no. (%)		1/19	(5/95)	1/2	(33/67)	5/25	(17/83)
Disease subset	dSSc no. (%)	11	(55)	0	0	20	(67)
	lSSc no. (%)	9	(45)	3	(100)	10	(33)

* values are expressed as mean±SD; PH=pulmonary hypertension; PASP=pulmonary artery systolic pressure; FVC-forced vital capacity; HRCT – high resolution computed tomography; ANA=antinuclear antibodies; Scl-70=anti-topoisomerase I antibodies; ACA=anticentromere antibodies; lSSc – limited systemic sclerosis; dSSc – diffuse systemic sclerosis

Table 3. **Clinical characteristics of the patients with isolated PH**

	Patients with isolateded PAH						
	Age/years	**Disease duration**	**Disease subset**	**antibodies**	**PASP mmHg**	**6-min.-walk test**	**FVC (%)**
1	66	25	lSSc	ANA	110	110 m	84
2	47	16	lSSc	ACA	37	450 m	110
3	46	11	lSSc	ANA	99	75 m	82

PAH=pulmonary arterial hypertension; PASP=pulmonary artery systolic pressure; FVC=forced vital capacity; ANA=antinuclear antibodies; ACA=anticentromere antibodies; lSSc=limited systemic sclerosis; dSSc=diffuse systemic sclerosis

pneumonia had the diffuse form of SSc and the remaining 9/20 (45%) had the limited SSc (*Tab. 2*).

The PH without changes in the lung tissue (normal results of HRCT examination) was observed in 3 cases out of 53 subjects studied. In these 3 patients isolated PH (arterial PH) was diagnosed. Although the group was small its clinical differentiation was characteristic. The mean age was 53±11 years while the duration of the disease 17±7 years. The 6-minute-walk test was on average 212±207 meters. The mean value of PASP was 82±39 mmHg and FVC (Forced Vital Capacity) – 92±15.6%. Anti-Scl-70 antibodies were not found in any of these 3 patients and 1 person (33%) had positive ACA. The other 2 patients (67%) had ANA antibodies. All the patients suffered from the limited form of the SSc (*Tab. 2* and *3*).

The mean age of the patients without the PH was 49±15 years and the duration of the disease was 12±9 years. The mean test of the 6-minute-walk was 428±102 meters, and FVC was 92.0±15.8%. The majority of patients of this group did not reveal the tricuspid valve insufficiency, which prevented PASP measurement. Only 3 out of 30 patients presented a recoil wave of PASP values below 35 mmHg (mean 32±1.7 mmHg) through the tricuspid valve. Anti-Scl-70 antibodies were observed in 10 out of 30 patients (33%) while ACA – in 5/30 subjects (17%). The diffuse form of the SSc was diagnosed in 20 patients (67%) and the limited form – in 10 patients (33%) (*Tab. 2*).

The statistical analysis did not show any significant differences among the three groups of PH patients as far as the tolerance of physical effort is concerned (the 6-minute-walk test). However, low tolerance of physical effort of patients with isolated PH (p=0.07), as compared to those without the PH, should be noticed. It seems that lack of distinct statistical difference may occur due to small number of patients with the isolated PH.

FVC varied markedly between the groups of patients without the PH and those with the PH and interstitial lung disease (p=0.002), values statistically significant.

Discussion

As a result of our observation we can state that in the group of 53 patients with the SSc, most patients with the PH in the course of systemic sclerosis reveal the interstitial lung disease. It concerns both forms of the SSc: the limited and diffuse ones. In our study, the PH patients showed a predominance of Scl-70 antibodies.

The PH occurs frequently in patients with the SSc, even more than 50% of examined subjects can suffer from it. It is confirmed by the literature, where in the course of the diffuse SSc, the PH (as a result of the interstitial lung disease – secondary PH) occurs in up to 80% of patients [6,10,11]. The isolated (arterial) PH is observed mainly in the group of patients with the limited form of the SSc (approximately 10% of patients) as well as with the presence of ACA [5,6,12]. Our study presents similar results. The patients with the isolated PH constituted a small 3-person group (6%) with a differentiated clinical

course of the limited SSc. In this group the values of the PASP tend to be higher than in the group with the PH and interstitial lung disease. The physical efficiency of these patients was also lower than in the patients with PH and interstitial lung disease (the 6-min-walk test, mean 212±207 m as compared to mean 353±143 m). Other authors [5,12] also observed a similar clinical course.

It seems that the examined by us cases are the group of patients with the advanced form of the disease. Only few early stages of the PH are detected in the course of the SSc. It is probably due to early asymptomatic course of the PH, which afterwards gives symptoms of effort tolerance lowering and dyspnoea [4,6].

Pulmonary and cardiovascular complications appear most frequently in the first years of diffuse SSc. Therefore, patients should be under thorough control as far as organ complication occurrence is concerned [5,10]. The golden mean of diagnosis of PH is considered to be the right heart catheterization. However, it is an invasive examination and available only in highly specialized centers [3]. There were many studies performed which showed that ECHO examination with Doppler method is as much effective in evaluation of the PH as the catheterization. On the other hand, it is less accurate as there is lack of the recoil wave through the pulmonary arterial valve, which prevents a detailed evaluation but the ECHO examination provides additional information about the structure and function of the heart muscle [4,13,14]. The ECHO examination is nowadays considered as the screening of the PH in patients with the systemic sclerosis and as such should be conducted every year to enable introducing an early therapy of the PH [9,13].

The PH is an important diagnostic and therapeutic problem in patients with the SSc. In case of the limited SSc, a special attention should be paid to the presence of isolated arterial PH, which occurs usually after several years of the onset and can be characterized by a dramatic course due to high values of the pulmonary arterial pressure, deteriorating physical efficiency of the patients and lack of fully effective therapy. The PH secondary to the interstitial lung disease frequently occurs both in patients with diffuse and limited SSc [9]. Thus, it is necessary to perform early diagnostics to detect the PH (ECHO) in each patient who is suspected of suffering from an interstitial lung disease based on the spirometric examination [8]. It would allow to introduce early therapy of both lung fibrosis and PH in such patients.

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