

Prosthetic status and needs of HIV positive subjects

Choromańska M^{1*}, Waszkiel D²

¹ Department of Conservative Dentistry, Medical University of Białystok, Poland

² Department of Paedodontics, Medical University of Białystok, Poland

Abstract

Purpose: The aim of this study is an evaluation of existing dentition reconstructions in HIV-infected patients and definition of prosthetic needs of the examined population.

Material and methods: We examined 49 HIV-infected subjects (19-52 years of age) and 49 non-infected patients as the control group. Dental services were evaluated using treatment structure. The analysis of teeth loss was performed by using index created by Rogowiec. The area of prosthetic treatment was also defined. Acquired data were analyzed in examined populations regarding infection's duration time.

Results: Analysis of Rogowiec index values showed heavy losses in all anatomic groups of teeth and treatment structure index in the group of HIV infected subjects reached value 71.27%. The percentage of infected patients using prosthetic dentures was two times higher than in control group. In mandible, this difference was more significant. As the HIV infection's duration time increased, the percentage of subjects with prosthetic dentures in both dental arches also increased. Reconstruction of maxilla's dentition was necessary in 38.78% of HIV(+) subjects. In infected group, the necessity of reconstruction of teeth loss in lower dental arch reached 46.94%. As the infection's duration time increased, prosthetic needs of upper dental arch slightly decreased and needs of lower dental arch increased.

Conclusions:

1. Using only emergency dental aid by HIV infected people results in significant loss of dentition.

2. Extraction domination over conservative reconstructions in dental treatment, despite of young age of examined subjects, leads to damage of mastication organ.

3. The teeth loss in subjects infected for a longer period of time, results in increased need of prosthetic treatment.

Key words: HIV infection, prosthetic status, prosthetic needs.

Introduction

Prosthetic treatment of oral cavity is carried in order to improve aesthetics and reinstate lost mastication functions. All these premises are to improve quality of patient's life. Increasing loss of dentition is causing a necessity of mastication organ's rehabilitation by using dentures.

Oral cavity is mainly a preliminary segment of an alimentary tract and a significant dentition loss disturbs mastication functions [1]. The consequences of lack of dentures can be significant changes in an alimentary tract such as: chronic gastritis or more frequent and more intense *Helicobacter pylori* infections [1].

Aesthetic look of a patient can also have a significant meaning in a social life. HIV-infected patients are mainly young persons, under 30 whose dentition status is not satisfying. Significant dentition loss, also in frontal segment, is a consequence of an extreme life style. The main part of HIV-infected subjects are people, who are or who were addicted to narcotics [2]. Dentition lacks are often an obstacle to young people applying for a profitable job or trying to undertake social functions. They also have an impact on a low self-esteem of HIV-infected subjects.

AIDS symptoms occurs later due to contemporary High Antyretroviral Therapy, what lengthens life time of a HIV-infected person. This is a premise of increasing meaning of restoring aesthetic and masticatory functions of masticatory organ in HIV-infected patients group.

* CORRESPONDING AUTHOR:

Magdalena Choromańska
Department of Conservative Dentistry
Medical University of Białystok
ul. M. Skłodowskiej-Curie 24A
15-276 Białystok, Poland

Table 1. Tooth loss in examined populations according to infection's duration time

Examined group	Number of subjects	Molars/pre-molars	Canines	Incisors
Infected <4 years (I)	30	4.90	0.40	0.73
Infected >4 years (II)	19	8.68	1.26	2.95
Infected in general (A)	49	6.45	0.73	1.55
Non-infected (B)	49	2.45	0.06	0.20
Statistical analysis – p<0.05 for groups		A and B	A and B	A and B
		I and II	I and II	I and II

Table 2. Prosthetic status in HIV-infected subjects in regard to time of infection

Examined group	Number of subjects	Maxilla								Mandible							
		Bridge		Bridge and removable denture		Removable denture		Total		Bridge		Bridge and removable denture		Removable denture		Total	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Infected <4 years (I)	30	0	0	1	3.33	3	10.00	4	13.33	0	0	1	3.33	0	0	1	3.33
Infected >4 years (II)	19	0	0	2	10.53	4	21.05	6	31.58	0	0	1	5.26	3	15.79	4	21.05
Infected (A)	49	0	0	3	6.12	7	14.29	10	20.41	0	0	2	4.08	3	6.12	5	10.20
Non-infected (B)	49	1	2.04	0	0	4	8.16	5	10.20	0	0	0	0	1	2.04	1	2.04

The aim of this study is an evaluation of existing dentition reconstructions in HIV-infected patients and definition of prosthetic needs of the examined population.

The acquired results were analyzed statistically. Hypotheses were verified by using t – student test or U Mann-Whitney's test and rejected if $p \leq 0.05$.

Material and methods

49 HIV-infected subjects were examined. They were patients of Department of Observation and Infection Medical University of Białystok, including 12 females and 37 males, 19-52 years of age (the average age – 30.65). 67.4% of HIV-infected subjects were intravenous drug users. The control group consisted of equal number of non-infected subjects, who were the same age and sex as the HIV(+) population.

Oral examination was conducted at artificial light using basic dental equipment according to WHO criteria from "Oral Health Surveys Basic Methods" [3]. The results were stored on examination cards, adjusted to study needs.

Acquired information on dentition status allowed to analyse existing dental services. Dental services were evaluated using treatment structure index [3,4]. Treatment structure index [4] is expressed by division of percentage of removed teeth (Mx100) to general number of effective services (M+F).

The analysis of teeth loss was performed by using index created by Rogowiec [5]. The area of prosthetic treatment was also defined.

Acquired data were analyzed in examined populations regarding infection's duration time. The time, from diagnosing the infection to examination time was considered as the infection's duration time. Subjects were divided into two groups according to infection's duration time:

- I group – subjects, whose infection's duration time was shorter than 4 years – 30 subjects,
- II group – subjects infected for more than 4 years – 19 subjects.

Results

Tab. 1 shows average values of tooth loss index according to Rogowiec. The data from the table shows higher general tooth loss in HIV(+) patients compared to non-infected subjects. The data concerns all teeth groups. In examined population, the highest tooth loss was found in side segment (molars and premolars). HIV(+) subjects lost an average 6.45 teeth, non-infected subjects lost only 2.45 teeth. Also in frontal segment, the tooth loss was higher in HIV-infected group. In the area of incisors, the loss of 1.55 teeth was found and in the area of canines – the loss of 0.73 tooth.

The tooth loss index in non-infected group was over 7 times lower for incisors and over 12 times lower for canines than in HIV(+) group. The data included in the analyzed table allowed examiners to analyse the tooth loss according to infection's duration time. The highest tooth loss was found in subjects infected for over 4 years (II group). Their average number of removed molars and premolars teeth reached 8.68, when as in I group, the number was 1.5 times lower – 4.90. As the infection's duration time increased, the frontal tooth loss index also increased. Subjects with shorter infection's duration time lost an average 0.73 incisor, where as subjects with longer infection's duration time lost 2.95 incisors. Similar relations were observed according to canines, which loss increased from 0.40 tooth in I group to 1.26 teeth in II group. The statistical analysis revealed significantly greater tooth loss in patients with longer infection's duration time in comparison with patients who were infected for a shorter period of time. That included the tooth loss in frontal and side segment.

The prosthetic status of examined populations according to infection's duration time is showed in Tab. 2. The percentage of

Table 3. Prosthetic needs in examined populations

		Examined group					
			Infected <4 years (I)	Infected >4 years (II)	Infected (A)	Non-infected (B)	
			Number of subjects				
		30	19	49	49		
Maxilla	Requires a reconstruction of one missing tooth (bridge)	1	n	1	0	1	3
			%	3.33	0	2.04	6.12
	Requires a reconstruction of more than one missing tooth (bridge or partial denture)	2	n	10	6	16	12
			%	33.33	31.58	32.65	24.49
	Requires a combination (bridge and partial denture)	3	n	1	0	1	0
		%	3.33	0	2.04	0	
Requires a complete denture	4	n	0	1	1	0	
		%	0	5.26	2.04	0	
Total			n	12	7	19	15
			%	40.00	36.84	38.78	30.61
Mandible	Requires a reconstruction of one missing tooth (bridge)	1		2	2	4	1
				6.67	10.53	8.16	2.04
	Requires a reconstruction of more than one missing tooth (bridge or partial denture)	2		9	7	17	19
				30.00	36.84	34.69	38.78
	Requires a combination (bridge and partial denture)	3		1	0	1	0
			3.33	0	2.04	0	
Requires a complete denture	4		0	1	1	0	
			0	5.26	2.04	0	
Total			12	10	23	20	
			40.00	52.63	46.94	40.62	

infected patients using dentures (20.41%) was two times higher than in control group (10.20%). In mandible, this difference was more significant, because dentures were present in 10.20% of infected patients and in 2.04% of non-infected subjects. HIV-infected subjects had mainly removable dentures. The presence of removable dentures was observed in maxilla in 14.29% of HIV-infected and in mandible in 6.12% of HIV positive subjects. Combination of bridge and partial denture was observed in maxilla in 6.12% of HIV positive subjects and in mandible in 4.08% of HIV-infected. As the HIV-infection's duration time increased, the percentage of subjects with dentures in both dental arches also increased.

Prosthetic needs of examined groups are showed in Tab. 3. Reconstruction of maxilla's dentition was necessary in 38.78% of HIV(+) subjects and in 30.61% of non-infected subjects. In infected group, the necessity of reconstruction of teeth loss in lower dental arch was higher (46.94%) compared to the control group (40.82%). As the infection's duration time increased, prosthetic needs of upper dental arch slightly decreased and needs of lower dental arch increased. The observation indicates that only persons with longer infection's duration time need to have complete denture of maxilla (5.26%) and mandible (5.26%) made.

Treatment structure index, which enables the evaluation of relations between treatments provided in the conservative restorations and extractions area, in the group of HIV-infected

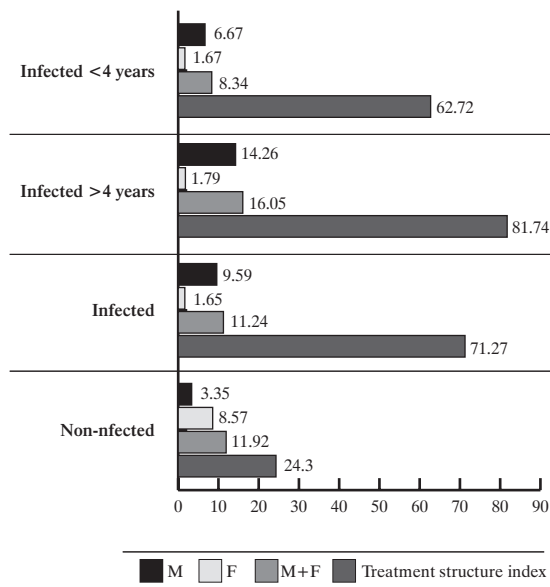
subjects reached value 71.27%, where as in group with shorter infection's time it was 62.72% and as the infection's duration time increased, it increased to 81.74%. The increase of treatment structure index value with infection's duration time give evidence about increasing advantage of removed teeth to provided effective dentistic treatments in general. Clear, statistically significant differences in treatment structure were observed between infected group and control group. Values of treatment structure index in both infected populations (groups I and II) also differed statistically significantly (Fig. 1).

Results and discussion

HIV-infected subjects made a small percentage of people inhabiting Podlasie province. With regard to progressive increase of infected people, their dentition status and dental needs is becoming a problem, which needs to be solved as soon as possible. It is assumed, that 70-90% of HIV-infected people are intravenous drug users [6-8]. Bruziewicz-Mikłaszewska et al. [6] proved, that tooth ache is the main cause of drug users to visit dental practice, but then it is too late for conservative restorations and a tooth has to be removed.

Patients examined by me, are mainly drug addicts, who were infected with HIV during intravenous drug application. That is

Figure 1. Treatment structure index in dependance on HIV infection's duration time



why intensification of carries process needs to be connected to extreme life style, insufficient oral cavity hygiene and stopping visiting to dental practise [6]. Dentition aesthetic disturbances in frontal segment also discourage HIV-infected people to visit dental practise, what is proved by significant number of lost teeth in frontal segment. Different results were presented by Matee et al. [9] when evaluating dentition status in HIV-infected people in Tanzania. In their opinion, there are no statistically significant differences in dentition status between HIV-infected and non-infected subjects.

The financial status of my examined patients was also important. More than half of them have never worked and has been supported only means from social welfare. In the population examined by Matee et al. [9], sexual intercourses were the main way of virus transmission, what did not have influence on life style or degradation of social and financial conditions in the way, it could be observed in drug addicts.

The result of avoiding visiting dental practice was the increase of teeth loss in persons living with HIV. Analysis of Rogowiec index values showed heavy losses in all anatomic groups of teeth. One needs to emphasize the high tooth loss index in frontal segment in HIV(+) persons, who had about seven times more incisors and twelve times more canines removed than in control group. Obtained results are confirmed by Szymaniak et al. studies [10]. Content analysis with infection's duration time taken under consideration, showed statistically significant lesser teeth loss in persons who had been infected for a shorter period of time. It has been documented in all teeth groups. Therefore my study confirmed the opinion, that a degree of dentition erosion is in proportion to HIV infection's duration time.

Basing on analysis of treatment structure index value, I evaluated the range of existing dental care. The index, in the HIV-infected group, turns out to be very disadvantageous. The

analysis of treatment structure index shows that 71.27% of dental treatments on HIV-infected patients are teeth extractions. This disadvantageous structure has been documented by other authors [8,10], who emphasize the high number of extractions, which exceeds the number of conservative restoration.

The time of infection's duration significantly changes the value of treatment structure index, what is manifested by increase of the number of extracted teeth from 6.67 in the group of subjects with shorter infection time, to 14.26 in the group of subjects with longer infection time.

The tooth loss requires a prosthetic treatment. Dentures are used more frequently by infected persons than by non-infected. Disease's duration time of infected people had impact on the increase of the percentage of people using dentures. As far as prosthetic treatment is concerned, the needs for treatment are greater in HIV(+) group than in control group and increased in proportion to infection's duration time. Bruziewicz-Miklaszewska et al. [6] affirmed, that in spite of high percentage of HIV-infected people using dentures, there is still a significant group of patients with large, not reconstructed teeth loss. This opinion has been proved in my study's results.

Conclusions

1. Using only emergency dental aid by HIV-infected people results in significant loss of dentition.
2. Extraction domination over conservative reconstructions in dental treatment, despite of young age of examined subjects, leads to damage of masticatory organ.
3. The teeth loss in subjects infected for a longer period of time, results in increased need of prosthetic treatment.

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