

Prevalence of *Chlamydia trachomatis* infection in women with cervical lesions

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Abstract

Purpose: The study objective was to evaluate the prevalence of *Chlamydia trachomatis* (*C. trachomatis*) infection in women with and without pathological lesions in the uterine cervix.

Material and methods: A total of 120 patients, aged 15-57 (mean age 29), recruited for the study, were referred by gynaecological clinics in the Podlasie province. Gynaecological examinations confirmed cervicitis accompanied by erosions in 75 patients (group I) and cervicitis alone in 45 women (group II). The comparative group (control) consisted of 35 women, aged 16-48 years (mean age 29), who had no clinical symptoms or pathological lesions in the cervix.

Direct immunofluorescence tests (MicroTrack, Syva) or polymerase chain reaction assays (PCR, Roche) were used to detect *C. trachomatis* infection in cervical samples. Anti-chlamydial IgG antibodies in the serum were determined using an immunoenzymatic assay (*C. trachomatis* IgG, EIA medac).

Two-frequencies test was used for the statistical analysis of results. P values of <0.05 were considered statistically significant.

Results: In the direct tests, *C. trachomatis* infection was found in group I in 9/75 women (12.2%), in group II in 9/45 (20%) and in the comparative group in 1/35 (2.9%) (group I vs control $p>0.1252$; group II vs control $p<0.025$). IgG specific antibodies were detected in group I in 17/49 patients (34.7%), in group II in 5/18 (27.8%) and in the comparative group in

2/35 (5.7%) women (group I vs control $p<0.0022$; group II vs control $p<0.0319$).

Conclusions: Our results show a higher prevalence of *C. trachomatis* infection in female patients with cervical lesions as compared to unaffected women, thus suggesting that diagnostic tests for *C. trachomatis* infection should be included in the screening programs for women.

Key words: *Chlamydia trachomatis*, cervicitis, cervical erosion, anti-chlamydial trachomatis antibodies.

Introduction

Chlamydia trachomatis (*C. trachomatis*) according to CDC (Centre for Disease Control and Prevention in Atlanta) is one of the most frequently detected sexually transmitted bacterial pathogens [1]. Chlamydial infections in women have major epidemiological and clinical significance, and are usually asymptomatic (in up to 80% of all cases) [2]. The most common clinical manifestation of *C. trachomatis* infection in women is cervicitis, being associated with the affinity of the chlamydial pathogen for epithelial cells. In the literature, this ailment is usually called "mucopurulent cervicitis" and characterized by congestion of the vaginal part of the uterine cervix, which bleeds easily, and by the presence of mucopurulent secretion from the cervical canal [3]. The relationship between *C. trachomatis* infection and cervicitis was first described by Dunlop et al. in 1966 [4].

Recently, a relationship has been observed between exposure to *C. trachomatis* infection and subsequent development of cervical precancerous or cancerous lesions [5-8].

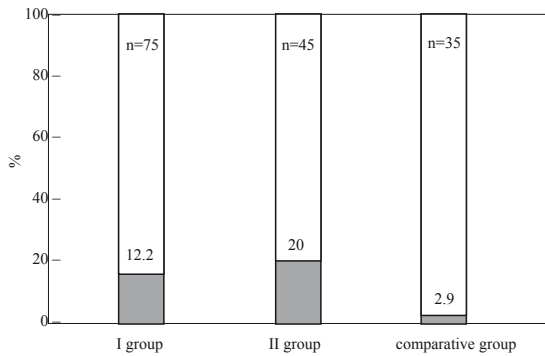
The aim of the current study was to evaluate the incidence of *C. trachomatis* infection in women with and without pathological lesions in the uterine cervix.

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Figure 1. The result of direct diagnostics in women with pathological cervical changes and in comparative group



Material and methods

The study involved 120 women, aged 17-57 (mean age 29), who were referred to the Centre for STD Research and Diagnostics in Białystok by gynaecological clinics in the Podlasie province. All the patients came with a previously established gynecological diagnosis to undergo testing for *C. trachomatis* infection. Among them, 75 had cervicitis with erosion (group I) and 45 had cervicitis alone (group II). None of the patients had received antibiotic treatment during the preceding 3 months. Mucopurulent vaginal discharge was the predominant clinical symptom.

The comparative group consisted of 35 women aged 16-48 (mean age 29), with no clinical symptoms or pathological lesions in the cervix.

Endocervical swabs and blood samples were obtained for analysis. Direct testing methods were used in all the patients and serological tests were performed in 49 women from group I and in 18 patients from group II.

Direct immunofluorescence tests (MicroTrack, Syva) or polymerase chain reaction assays (PCR, Roche) were performed to detect *C. trachomatis* antigen and/or genetic material. Immunoenzymatic assays (Chlamydia IgG EIA, medac) were used to detect specific IgG antibodies against *C. trachomatis*. According to the manufacturer’s instruction, the ISR value of >1.1 was considered positive.

Additionally, we evaluated the incidence of *C. trachomatis* infection according to the patients’ age, analyzed data concerning contraceptive methods used by each patient and referred to demographic data, i.e. place of residence and education.

Two-frequencies test was used for the statistical analysis of results. P values of <0.05 were considered statistically significant.

Results

In group I (patients with cervicitis accompanied by erosion), *C. trachomatis* infection was detected by direct methods in 9/75 women (12.2%), in group II (cervicitis without erosion) in 9/45 (20%). In the comparative group, *C. trachomatis* was found in 1/ 35 (2.9%). The results are shown in Fig. 1.

Positive results of IgG anti-*C. trachomatis* specific antibod-

Figure 2. The result of serological studies in women with pathological cervical changes and in comparative group

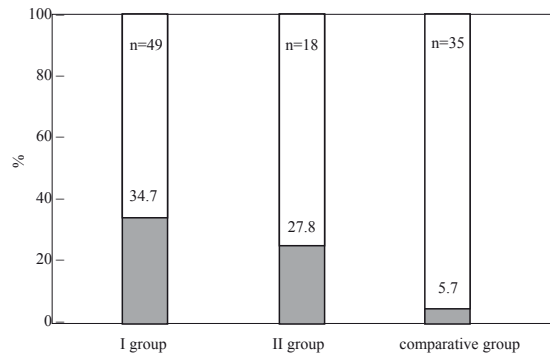
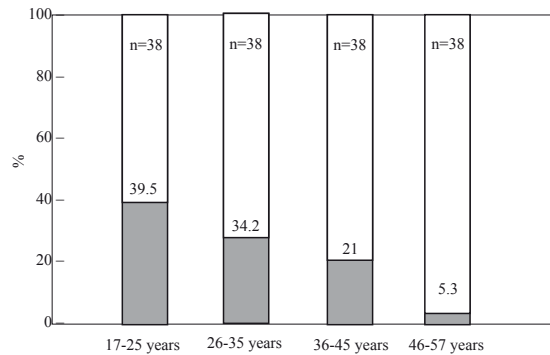


Figure 3. Prevalence of C. trachomatis infection in age groups



ies were detected in 17/49 women (34.7%) in group I and in 5/18 (27.8%) in group II (p>0.5958). In the comparative group, specific antibodies were present only in 2/35 cases (5.7%) (group I vs control p<0.0022; group II vs control p<0.0319). Serology results in women with cervical lesions (group I and II) and in the comparative group are shown in Fig. 2.

The percentage of chlamydia-positive patients was the highest in the age group of 17-25 (39.5%), while the lowest in the under – 57 (5.3%) – Fig. 3.

Most of the women with chlamydial infection were city dwellers (92.1%-35/38), and only 7.9% (3/38) lived in the country. In this group, 31.6% of patients (12/38) had secondary education, 28.9% (11/38) had technical education, 26.3% (10/38) had higher education and 13.2% (5/38) primary education. Also in this group, 23.7% (9/38) gave a history of taking hormonal contraceptives. None of the patients used barrier contraception methods such as intrauterine devices or condoms.

Discussion

The role of *C. trachomatis* infection in cervical lesions has been the focus of numerous researches. Literature data show high incidence rates of chlamydial infection in women with cervicitis alone (20-40%) [9] and with cervicitis accompanied by erosion (50- 80%) [10,11]. Using either the direct or serological tests we found no statistically significant differences between group I and group II.

However, in our study a higher percentage of patients with cervical lesions were *C. trachomatis*-positive, as compared to

the control. In the direct test, *C. trachomatis* was detected in 12.2% of the patients in group I, in 20% in group II and in 2.9% in the comparative group. Similar results were reported by Qian, who found *C. trachomatis* infection in 13.4% of women with cervical erosion, the rate being substantially higher than in lesions-free patients [12]. We found statistically significant differences between group II and the comparative group in the direct tests for *C. trachomatis*, but not between group I and the control.

In the literature, *C. trachomatis* IgG antibodies in patients with symptoms of cervicitis were detected in 30-40% of patients [13,14], which is consistent with our findings. The slightly lower rate of positive results in our study as compared to earlier reports of other authors might be due to differences in the quality of diagnostic methods, which are currently more specific.

Recent scientific reports have indicated a possible role of *C. trachomatis* infection in the development of neoplasia as well as cervical carcinoma. Some authors reported a high percentage of chlamydia-positive patients with previously detected HPV infection (47.7-65.7%) [7,15]. Anttila et al. point at the role of *C. trachomatis* infection as an independent factor in the development of dysplasia and cervical carcinoma [5].

C. trachomatis infections are most commonly detected in women under 25 years of age [8,16]. We found as many as 39.5% of chlamydia-positive patients in the age group of 17-25.

A literature survey suggests that the use of hormonal contraceptive methods increases the risk of *C. trachomatis* infection [17,18]. Hormonal contraception promotes sexual activity and frequent changes of sexual partners, thus leading to cervical ectopy. In our study, among the *C. trachomatis*-positive patients only 23.7% used oral contraceptive pills, as most of them were married or had one sexual partner.

As revealed by demographic analysis, the majority of women with chlamydial infection originate from towns and have higher education. This is probably associated with better availability of diagnostic procedures and easier access to information concerning sexually transmitted infections in larger towns.

Conclusions

1. *C. trachomatis* infection is more common in women with pathological cervical lesions as compared to those without.
2. Our results show the necessity to include screening for chlamydial infection in the prophylactic schemes for women.
3. No statistically significant differences were found in the prevalence of *C. trachomatis* infection between women having and not having cervical erosions.

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