RESEARCH NOTE

Chlamydia trachomatis infections in heterosexuals attending sexually transmitted disease clinics in Slovenia

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ABSTRACT

This study assessed the age and gender distribution of Chlamydia trachomatis infections among patients attending two clinics for sexually transmitted diseases (STDs) in Slovenia. Between January 1999 and December 2003, 1714 heterosexual male and 892 heterosexual female patients were tested for C. trachomatis. The prevalence of C. trachomatis infection was 19.5% (n = 334) for male patients and 10.7% (n = 96) for female patients, with the highest prevalence in the group aged 15–30 years. The prevalence decreased between 2000 and 2003 among female patients. The results support the implementation of routine screening for C. trachomatis genital infection among male and female patients aged <30 years attending STD clinics in Slovenia.

Keywords Chlamydia trachomatis, infection, prevalence, sexually transmitted disease, Slovenia, urethritis

Original Submission: 13 May 2004; Revised Submission: 9 July 2004; Accepted: 5 November 2004

Clin Microbiol Infect 2005; 11: 240–242
10.1111/j.1469-0691.2004.1070.x

Chlamydia trachomatis has been recognised as a major bacterial sexually transmitted disease (STD) in north America and western Europe [1]. The prevalence of infection for men in STD settings is 15–20%, with a corresponding figure for women.

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of >20% [2,3]. C. trachomatis accounts for 30–50% of non-gonococcal urethritis in men [4], and C. trachomatis genital infections impose a significant disease burden in women, in whom they can cause serious complications such as pelvic inflammatory disease, ectopic pregnancy and infertility [5].

In Slovenia, the prevalence of C. trachomatis infection among asymptomatic sexually active young (18–24 years) adults is substantial, amounting to 4.7% in both genders [6], while the prevalence of asymptomatic chlamydial urethritis among a group of military recruits (mean age, 19.8 years) from the Celje region was 2.6% [7]. However, little information is available regarding the prevalence of C. trachomatis infection among patients attending STD clinics for medical care in Slovenia. The present report describes a 5-year survey of C. trachomatis infection among patients attending STD clinics for >20% [2,3]. C. trachomatis accounts for 30–50% of non-gonococcal urethritis in men [4], and C. trachomatis genital infections impose a significant disease burden in women, in whom they can cause serious complications such as pelvic inflammatory disease, ectopic pregnancy and infertility [5].

The study sample comprised 1714 consecutive heterosexual male patients and 892 female patients (age range, 15–59 years) who sought medical care from the two STD clinics between January 1999 and December 2003. The male patients had symptoms and signs of urethritis, with mild-to-severe dysuria and discomfort in the urethra, and a clear-to-whitish or mucopurulent discharge. Female patients were mostly asymptomatic. The patients were advised not to urinate for 3 h before examination. At least two simultaneous Dacron swab (Meus, Piove di Sacco, Italy) samples were taken from the urethral meatus of male patients, and from the endocervix and urethra of female patients. The first swab was rolled onto a MicroTrak slide (Trinity Biotech, Wicklow, Ireland), while the second swab was placed in 1.5 mL of 2 M sucrose phosphate (2SP) Chlamydia transport medium, prepared in our laboratory, for culture and PCR. The swab specimens for culture and PCR were frozen at −70°C until required for testing.

All samples were examined by the MicroTrak (Trinity Biotech) direct fluorescent antibody (DFA) test and were also cultured. A sample was considered positive if at least ten chlamydial elementary bodies were observed in the specimen by the DFA test, or if at least one inclusion body of C. trachomatis was observed following the addition of specific monoclonal antibodies (Trinity Biotech) to cycloheximide-treated McCoy cells. In 537 cases, the results of the two tests were inconclusive, either because of the small number of elementary bodies (< ten) found by DFA, non-specific fluorescence, an excess of mucus in the sample, or destruction of cells observed in culture. For these 537 samples, the Amplicor PCR assay (Roche Diagnostic Systems, Basel, Switzerland) was performed. Internal control target DNA was included in each PCR run to monitor the inhibition of amplification. The PCR results were interpreted according to the recommendations of the manufacturer.

C. trachomatis infection was diagnosed in 334 (19.5%) of the 1714 male patients, and in 96 (10.7%) of the 892 female patients (Table 1). The prevalence of C. trachomatis infection peaked in the group aged 21–30 years in both genders (26.2% for male patients, 16.7% for female patients) and decreased thereafter with increased age. The observed prevalence, as documented by age and gender, was in accordance with previous findings [8–10]. In the USA, nearly 75% of all new cases occur in women aged <25 years, while non-gonococcal urethritis is the most commonly diagnosed STD in men [11]. Sexually active adolescents and young adults are particularly susceptible to genital chlamydial infections because of their greater rate of exposure to high-risk sexual behaviour [12]. Moreover, the frequent spread of Chlamydia to regular female partners is not unexpected, because the symptoms are often mild or even absent for a long period [1].

The overall prevalence of C. trachomatis showed a decreasing trend after the year 2000 (Fig. 1). This might be associated with a change

<table>
<thead>
<tr>
<th>Age group</th>
<th>Male patients</th>
<th>Female patients</th>
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<tbody>
<tr>
<td>No. tested</td>
<td>No. positive</td>
<td>Prevalence (%)</td>
</tr>
<tr>
<td>15–20</td>
<td>101</td>
<td>23</td>
</tr>
<tr>
<td>21–30</td>
<td>729</td>
<td>191</td>
</tr>
<tr>
<td>31–40</td>
<td>469</td>
<td>89</td>
</tr>
<tr>
<td>41–50</td>
<td>274</td>
<td>26</td>
</tr>
<tr>
<td>&gt; 51</td>
<td>141</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>1714</td>
<td>334</td>
</tr>
</tbody>
</table>
in sexual behaviour following mass health education campaigns. A relatively higher prevalence of *C. trachomatis* infection was observed among male as opposed to female patients. However, this gender difference does not necessarily reflect a true difference in the epidemiology of *C. trachomatis* infection. The higher rates of positivity in male patients could reflect the increased rates of testing in males attending the STD outpatient clinics, as female patients usually prefer to visit their gynaecologist for testing. In Sweden, a relatively larger proportion of male cases has also been reported, and the female-to-male ratio of notified *C. trachomatis* infections has declined, which reflects increased testing of male patients [2].

In the present study, culture and DFA were performed for all patient samples, while PCR was performed only for 537 samples for which the results of DFA and/or culture were doubtful. However, the sensitivity of DFA has been estimated at 89.8%, and that of culture at 83.8%. DFA results with < ten elementary bodies were positive by PCR in 18 (3.4%) culture-negative cases, and in nine (1.7%) DFA- and culture-negative specimens. The remaining 510 samples were negative by PCR. These data indicate that the true prevalence of *C. trachomatis* infections might have been higher than that observed.

The results of this study strongly support the implementation of routine testing for *C. trachomatis* among men and women who attend STD clinics in Slovenia. The treatment of positive patients, and the tracing, screening and treatment of the sexual partners of infected individuals, are two important goals. The possible severe complications of untreated asymptomatic *C. trachomatis* infections mean that routine screening programmes should be considered in Slovenia for *C. trachomatis* infections among at least the sexually active population aged <30 years.

**ACKNOWLEDGEMENTS**

We thank I. Bernjak-Simaga and D. Krecic Bavcon for technical assistance.

**REFERENCES**