Prevalence of chlamydia and mycoplasma genital infections in women aged ≥ 20 years and < 20 years: a comparison between 2008 and 2010

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Abstract

Background: Sexually transmitted infections represent a serious problem of public health. Chlamydia and Mycoplasms infections are involved in the pathogenesis of female infertility and in other serious gynaecologic and obstetric or neonatal complications. This study aims to analyze the prevalence of these infections in adult women and teenagers and to evaluate variations between 2010 and 2008.

Methods: Women of reproductive age, sexually active, regardless of symptoms, examined only once for Chlamydia or, alternatively, for Mycoplasms vaginal/cervical infections, in 2008 (January-May) and in 2010 (January-May), at the Sandro Pertini Hospital were considered. Chlamydia was detected using Polymerase chain reaction; Mycoplasms were detected through culture. Patients were divided into women aged <20 years and ≥20 years. The Prevalence of Chlamydia and Mycoplasms infections was analyzed in both groups and compared (χ² test).

Results: In 2008, 20 (1.46%) out of 1369 of this hospital's patients aged ≥20 years versus 0 (0%) of 33 aged <20 years had Chlamydia infection. In 2010, the prevalence of Chlamydia infection was significantly higher in women <20 years old than in adult patients (10.3% versus 1.50%) (P = 0.0002). In 2008, 497 (36.9%) of the 1346 adult women and 7 (28%) of 25 patients <20 years old had Mycoplasms infection. In 2010, the prevalence of Mycoplasms infection was significantly higher in women under 20 years (56%) than in adult patients (34.8%) (P = 0.027). The prevalence of Mycoplasms infection amongst women aged <20 years was significantly higher in 2010 than in 2008 (P = 0.045).

Conclusions: We observed an increased prevalence of Chlamydia and Mycoplasms infections in women aged <20 years in 2010 as compared with 2008, but only few of young women were undergoing clinical examinations. Sexual education and access to clinical services should be promoted in order to achieve control of sexually transmitted infections.

Key words: chlamydia, mycoplasms, genital infections, sexually transmitted infections, adolescents
infections and programs for the control of STIs has been recognized worldwide [8].

The prevalence of Chlamydia and mycoplasms genital infections in women referred to the outpatient gynaecological offices of Sandro Pertini Hospital were considered in this study. We focused on these specific infections, since they have been widely involved in the pathogenesis of female infertility and multiple gynaecologic and obstetric pathologies [5,6].

Materials and methods

Women of reproductive age (aged 14-49 years), who underwent a microbiological examination of vaginal/cervical secretions for Chlamydia or, alternatively, for Mycoplasms during the period January-May 2008 and January-May 2010, at the Sandro Pertini Hospital of Rome, were eligible for the study, regardless of the presence of clinical symptoms. Vaginal/cervical swabs for Chlamydia or, alternatively, for mycoplasms were collected from women only once. Thus, one group of women was examined only for Chlamydia, and the other group only for mycoplasms. The group of patients examined in 2008 was different from the one examined in 2010. Patients who had never had sexual activity were excluded from the study. Informed consent was obtained from patients or, in the case of women < 18 years old, from parents.

The presence of Chlamydia infection was detected using polymerase chain reaction (PCR). Standard culture for Mycoplasms was used for the detection of these infections. Patients were classified into two categories: women aged < 20 years and ≥ 20 years.

Results

During 2008 (January to May), 1369 adult women and 33 women aged < 20 years were examined for Chlamydia genital infection. 20 (1.46%; 95% Confidence Interval (C.I.) = 0.83-2.00) out of 1369 patients ≥ 20 years old were positive for Chlamydia infection. During the same period, none (0%) of the 33 patients < 20 years old were positive on examination for Chlamydia (Table 1). The difference in prevalence of Chlamydia infection observed during the first months of 2008 between women aged ≥ 20 years and those aged < 20 years (1.46% versus 0%) was not statistically significant (X² = 0.488; P = 0.4848).

During 2010 (January to May), 1397 adult patients and 29 women < 20 years old were examined for Chlamydia genital infection. 21 (1.50%; 95% C.I. = 1.18-1.82) of 1397 women aged ≥ 20 years and 3 (10.3%; 95% C.I. = 0.07-21.3) of 29 patients aged < 20 years were positive for Chlamydia infection (Table 1). The difference in prevalence of Chlamydia genital infection between women aged ≥ 20 years and patients < 20 years (1.50% versus 10.3%) in 2010 was statistically significant (X² = 13.35; P = 0.0002) (Figure 1).

Nevertheless, amongst the women < 20 years old, the difference in the prevalence of Chlamydia infection observed in 2010, compared to 2008 (10.3% versus 0%), was not statistically significant (X² = 3.58; P = 0.058).

During 2008 (January to May) (Table 2), 1346 adult women and 25 patients aged < 20 years were examined for Mycoplasms genital infection. 497 (36.9%; 95% C.I. = 34.4-39.4) of 1346 women ≥ 20 years old and 7 (28%; 95% C.I. = 19.1-36.9) of 25 women < 20 years old were positive on examination for Mycoplasms. In 2008, the difference in prevalence of mycoplasms infection between women aged ≥ 20 years and those aged < 20 years (36.9% versus 28%) was not statistically significant (X² = 0.673; P = 0.41).

In 2010 (January to May) (Table 2), 1486 adult patients and 25 teenagers were examined for Mycoplasms genital infection. 517 (34.8%; 95% C.I. = 32.4-37.2) of 1486 patients aged ≥ 20 years and 14 (56%; 95% C.I. = 37.0-75.0) of 25 patients aged < 20 years were positive when examined for Mycoplasms. In 2010, the difference in prevalence of mycoplasms infection between women aged ≥ 20 years and patients < 20 years old (34.8% versus 56%) was statistically significant (X² = 4.84; P = 0.027) (Figure 2).

Furthermore, amongst the patients aged < 20 years, the difference in prevalence of Mycoplasms infection observed in 2010, compared to 2008 (56% versus 28%), was also statistically significant (X² = 4.0; P = 0.045) (Figure 3).

Discussion

A high prevalence of genital infections in the female adult population and in adolescents has been reported in the world literature [9,10]. Our study had several limitations: firstly, the prevalence of Chlamydia and Mycoplasms infections were evaluated in a short period of time (first five months of 2008 and 2010, respectively); secondly, the number of women aged < 20 years examined...
for either Chlamydia or Mycoplasms infection was small in this study; thirdly, the single groups of patients were examined only for a single infection, thus making it impossible to evaluate the prevalence of co-infections. Thus, on the basis of this study, no firm conclusion may be drawn.

However, interesting data emerge from these preliminary observations. In particular, our study evidenced a remarkable diffusion of the Mycoplasms infection in both the adult patients and in women aged < 20 years. However, the prevalence of mycoplasms infection in patients ≥ 20 years old decreased in 2010 compared with 2008 (34.8% versus 36.9%, respectively). On the contrary, the prevalence of Mycoplasms infection in women aged < 20 years in 2010 was twice as high as that in 2008, a statistically significant increase (56% versus 28%, respectively) (Figure 3). In 2010, the prevalence of Mycoplasms infection in women < 20 years old was significantly higher than

### Table 1. Prevalence of Chlamydia in 2008 and 2010 (January to May).

<table>
<thead>
<tr>
<th></th>
<th>Patients &lt; 20 years</th>
<th>Patients ≥ 20 years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. (Tot. 33)</td>
<td>No. (Tot. 1369)</td>
</tr>
<tr>
<td>Positive</td>
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<td>20</td>
</tr>
<tr>
<td>Negative Result</td>
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<td>1296</td>
</tr>
<tr>
<td>not available</td>
<td>9</td>
<td>53</td>
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<table>
<thead>
<tr>
<th></th>
<th>Patients &lt; 20 years</th>
<th>Patients ≥ 20 years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. (Tot. 29)</td>
<td>No. (Tot. 1397)</td>
</tr>
<tr>
<td>Positive</td>
<td>3</td>
<td>21</td>
</tr>
<tr>
<td>Negative Result</td>
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<td>1280</td>
</tr>
<tr>
<td>not available</td>
<td>1</td>
<td>96</td>
</tr>
</tbody>
</table>

* The specimen was not suitable for examination

The difference in prevalence between women aged ≤ 20 years versus > 20 years is statistically significant ($\chi^2 = 13.35; P = 0.0002$).
in women aged ≥ 20 years (Figure 2).

As regards Chlamydia infection, an increase in its prevalence was observed in women aged < 20 years in 2010 compared with 2008 (10.3% versus 0%, respectively) though this increase was not statistically significant. On the contrary, the prevalence of Chlamydia showed only a slight increase in adult patients in 2010 compared to 2008 (1.50 versus 1.46%, respectively). In 2010, the prevalence of Chlamydia infection too was significantly higher in women aged < 20 years than in adult women (10.3% versus 1.50%,
respectively) (Figure 1).

Importantly, in spite of such an increase in the prevalence of genital infections in women aged < 20 years observed in 2010 compared to 2008, our data showed that the number of adolescents undergoing microbiological examination of vaginal/cervical secretions is remarkably lower than in women ≥ 20 years old (Tables 1 and 2). This issue should cause concern considering that these data are observed in a developed country and in a city with a high standard of health care quality and availability of clinical services.

Risky sexual behavior, use of alcohol or drugs, social and economic factors, and the unavailability of clinical services for adolescents are some of the risk factors that have been implicated to explain the high prevalence and incidence of STIs amongst adolescents [4]. However, such high prevalence and incidence have also been observed in spite of moderate risk behaviours [10].

The consequences of STIs may be very serious, also because they are frequently asymptomatic and, if unrecognized, they may lead to PID, tubal infertility, ectopic pregnancy, and pregnancy or neonatal complications. Furthermore, several investigations have demonstrated the association between both non-ulcerative and ulcerative STIs and HIV infection [2,8]. Therefore, the importance of screening strategies for asymptomatic infections, such as Chlamydia [9], and programs for the management of STIs has been definitely assessed worldwide [8]. Effective clinical programs should include the management of curable symptomatic infections, screening and treatment of partners, and screening for asymptomatic infections. Nevertheless, education and promotion of the use of condoms, and other means of preventing STDs, have been assessed as crucial within programs aimed at controlling STIs in both developing and western countries [8]. In fact, clinical programs alone are not sufficient for the reduction of the prevalence and incidence of STIs since many people do not undergo clinical controls, as indicated by our study.

In summary, data from our study showed an increase in the prevalence of Chlamydia and Mycoplasms genital infections in women aged < 20 years in 2010 compared with 2008 and, worryingly, a small number of young women undergoing clinical and microbiological examination. Investigations on a larger number of teenagers are needed to confirm the increasing prevalence of STIs in the young female population evidenced by this study, even if it had methodological limitations. Nevertheless, should this epidemiologic trend be confirmed, we believe that the institution of programs providing sexual education in young people, with an elucidation of the risk sexual behaviours, the
risks of drug use, the risks associated with STIs and the importance of undergoing clinical controls should no longer be delayed. The goal of education is to enhance the self-efficiency of adolescents in practicing prevention of STIs and helping them reduce their risks [4]. In addition, since this factor has proved to be crucial in the prevention of STIs [8] access to clinical services should be promoted.

References