

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 Mycoplasmas 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 Mycoplasmas 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; Mycoplasmas were detected through culture. Patients were divided into women aged < 20 years and ≥ 20 years. The Prevalence of Chlamydia and Mycoplasmas infections was analyzed in both groups and compared (χ^2 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 Mycoplasmas infection. In 2010, the prevalence of Mycoplasmas infection was significantly higher in women under 20 years (56%) than in adult patients (34.8%) ($P = 0.027$). The prevalence of Mycoplasmas 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 Mycoplasmas 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, mycoplasmas, genital infections, sexually transmitted infections, adolescents

Introduction

Sexually transmitted infections (STIs) represent one of the most serious problems of public health in both western and developing countries. The World Health Organization (WHO) estimated that, when excluding AIDS, approximately 340 million new cases of curable STD's occur annually throughout the world in people aged 15-49 years [1,2]; 111 million of these cases affect people aged < 25 years [1,2]. In the United States (US), it has been estimated that 25% of women aged < 20 years are affected by a STI and a higher prevalence is reported in those aged 20-24 years [3]. An increase in sexual activity amongst young people, as well as the early onset of such behavior, have been observed during the last three decades and

this is thought to explain the rising trends in STIs [4]. Nevertheless, behavioural (sexual behaviour, drug use, health care behaviour), social, biological, psychological, and institutional factors have also been involved as risk factors for STIs [4].

Medical consequences of STIs, which are often asymptomatic and unrecognized, may be very serious. They may range from pelvic inflammatory disease (PID) to infertility, ectopic pregnancy, pregnancy complications (such as premature rupture of membranes and premature delivery), neonatal complications (such as low birth weight and serious neonatal infections) and cancer [5-7]. In addition, STIs have been reported as being predisposing factors for HIV infection [8]. Thus, the importance of screening strategies for asymptomatic



infections and programs for the control of STIs has been recognized worldwide [8].

The prevalence of Chlamydia and mycoplasmas 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 Mycoplasmas 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 mycoplasmas were collected from women only once. Thus, one group of women was examined only for Chlamydia, and the other group only for mycoplasmas. 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 Mycoplasmas was used for the detection of these infections. Patients were classified into two categories: women aged < 20 years and \geq 20 years. The prevalence of Chlamydia and mycoplasmas infections in these two groups of patients were analyzed and compared (X_2 test). The prevalence of both infections observed in both groups of patients in 2008 was compared (X_2 test) with those in 2010 in order to analyze possible variations in the epidemiological trend. Statistical analysis was performed using Microsoft Office Excel software, version 2007.

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 \geq 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 \geq 20 years

and those aged < 20 years (1.46% versus 0%) was not statistically significant ($X_2 = 0.488$; $P = 0.4848$).

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 \geq 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 \geq 20 years and patients < 20 years (1.50% versus 10.3%) in 2010 was statistically significant ($X_2 = 13.35$; $P = 0.0002$) (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 ($X_2 = 3.58$; $P = 0.058$).

During 2008 (January to May) (Table 2), 1346 adult women and 25 patients aged < 20 years were examined for Mycoplasmas genital infection. 497 (36.9%; 95% C.I. = 34.4-39.4) of 1346 women \geq 20 years old and 7 (28%; 95% C.I. = 19.1-36.9) of 25 women < 20 years old were positive on examination for Mycoplasmas. In 2008, the difference in prevalence of mycoplasmas infection between women aged \geq 20 years and those aged < 20 years (36.9% versus 28%) was not statistically significant ($X_2 = 0.673$; $P = 0.41$).

In 2010 (January to May) (Table 2), 1486 adult patients and 25 teenagers were examined for Mycoplasmas genital infection. 517 (34.8%; 95% C.I. = 32.4-37.2) of 1486 patients aged \geq 20 years and 14 (56%; 95% C.I. = 37.0-75.0) of 25 patients aged < 20 years were positive when examined for Mycoplasmas. In 2010, the difference in prevalence of mycoplasmas infection between women aged \geq 20 years and patients < 20 years old (34.8% versus 56%) was statistically significant ($X_2 = 4.84$; $P = 0.027$) (Figure 2).

Furthermore, amongst the patients aged < 20 years, the difference in prevalence of Mycoplasmas infection observed in 2010, compared to 2008 (56% versus 28%), was also statistically significant ($X_2 = 4.0$; $P = 0.045$) (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 Mycoplasmas 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

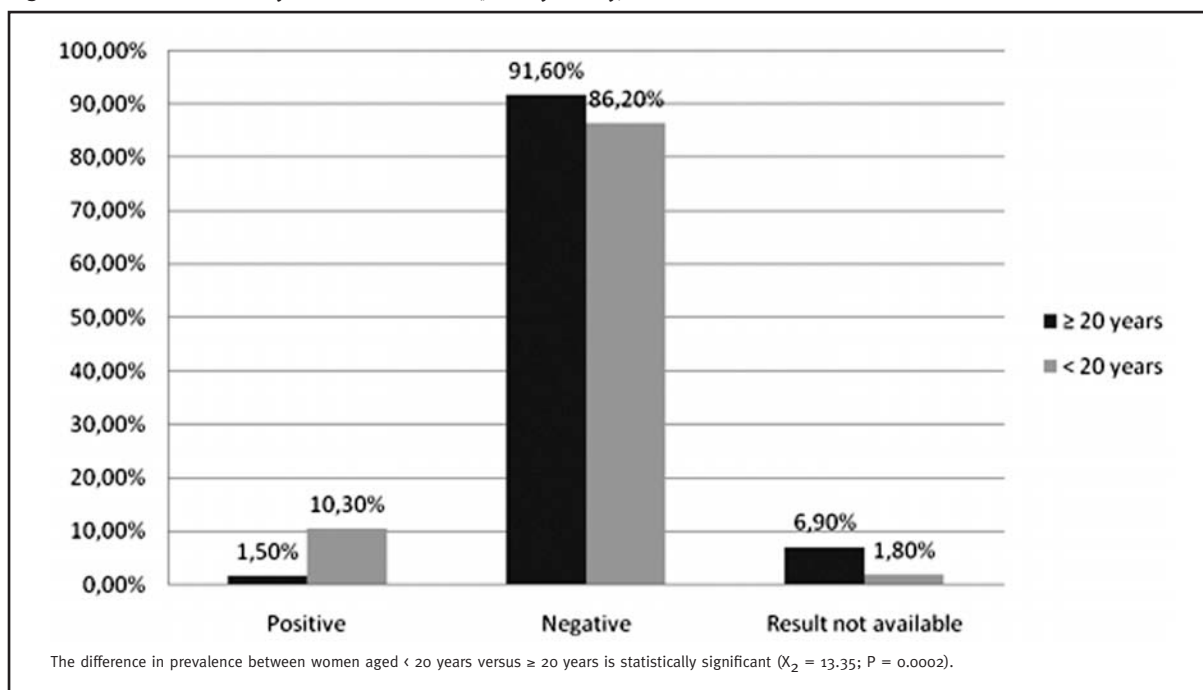
Table 1. Prevalence of Chlamydia in 2008 and 2010 (January to May).

	2008					
	Patients ≥ 20 years			Patients < 20 years		
	No. (Tot. 1369)	%	95% C.I.	No. (Tot. 33)	%	95% C.I.
Positive	20	1.46	0.83 – 2.00	0	-	-
Negative	1296	94.7	93.5 – 95.9	30	90.9	81.09 - 100
Result not available ^a	53	3.87	2.87 – 3.97	3	9.1	0.00 – 18.9

	2010					
	Patients ≥ 20 years			Patients < 20 years		
	No. (Tot. 1397)	%	95% C.I.	No. (Tot. 29)	%	95% C.I.
Positive	21	1.50	1.18-1.82	3	10.3	0.07-21.3
Negative	1280	91.6	90.2 – 93.0	25	86.2	73.7 – 98.7
Result not available ^a	96	6.9	5.6 – 8.2	1	3.5	0.00 – 10.1

^a The specimen was not suitable for examination

Figure 1. Prevalence of Chlamydia Infection in 2010 (January to May).



for either Chlamydia or Mycoplasmas 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 Mycoplasmas infection in both the adult patients

and in women aged < 20 years. However, the prevalence of mycoplasmas infection in patients ≥ 20 years old decreased in 2010 compared with 2008 (34.8% versus 36.9%, respectively). On the contrary, the prevalence of Mycoplasmas 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 Mycoplasmas infection in women < 20 years old was significantly higher than

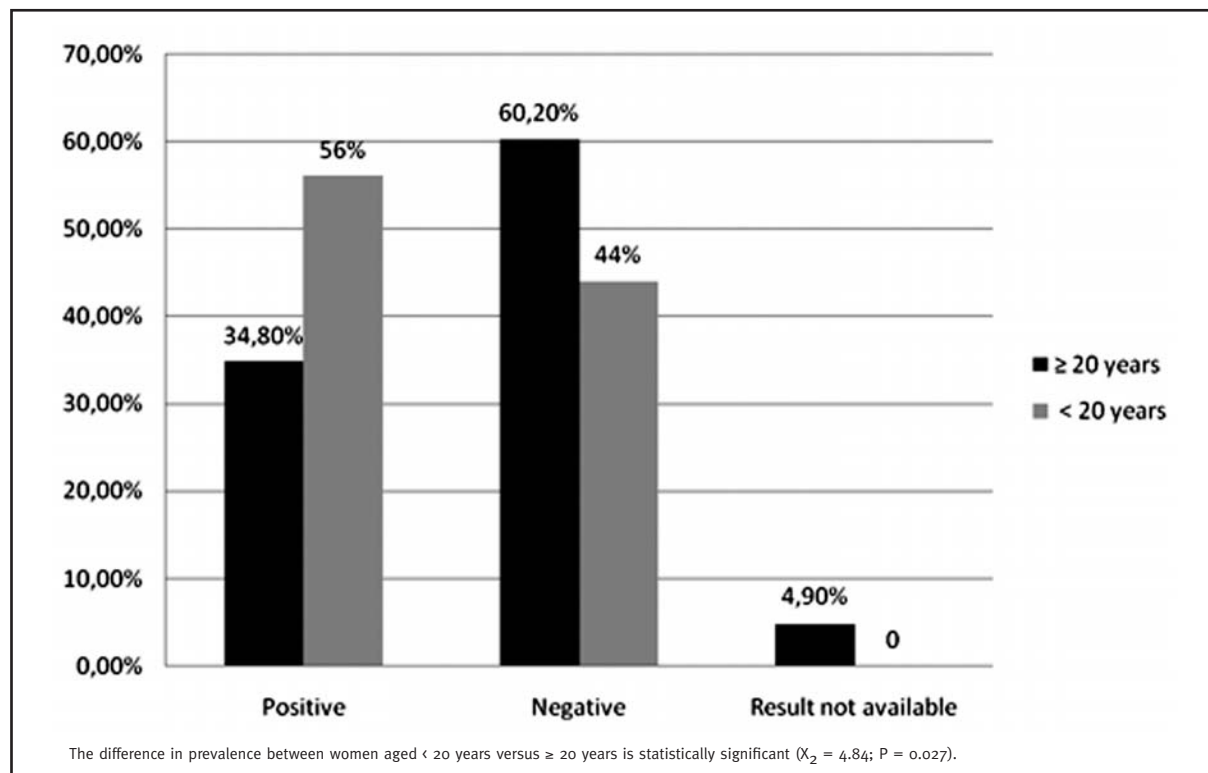


Table 2. Prevalence of Mycoplasmas in 2008 and 2010 (January to May).

	2008					
	Patients ≥ 20 years (Tot. 1346)			Patients < 20 years (Tot. 25)		
	No.	%	95% C.I.	No.	%	95% C.I.
Positive	497	36.9	34.4 - 39.4	7	28	19.1 - 36.9
Negative	834	61.9	59.3 - 64.4	18	72	54.4 - 89.6
Result not available^a	15	1.1	0.55 - 1.65	0	-	-
	2010					
	Patients ≥ 20 years (Tot. 1486)			Patients < 20 years (Tot. 25)		
	No.	%	95% C.I.	No.	%	95% C.I.
Positive	517	34.8	32.4 - 37.2	14	56	37.0 - 75.0
Negative	895	60.2	57.8 - 62.6	11	44	24.6 - 63.45
Result not available^a	74	4.9	3.8 - 5.9	0	-	-

^a The specimen was not suitable for examination

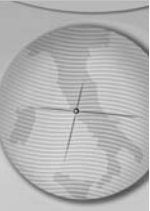
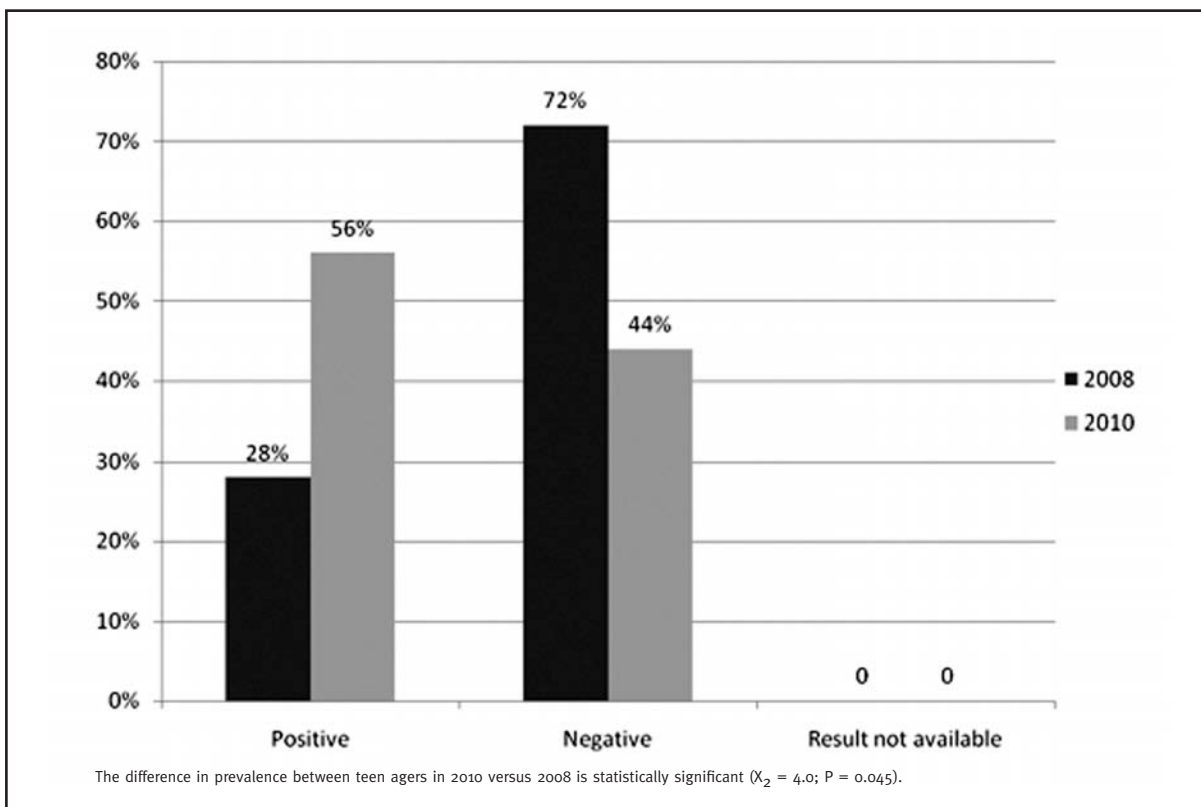
Figure 2. Prevalence of Mycoplasmas Infection in 2010 (January to May).



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%,

**Figure 3. Prevalence of Mycoplasmas Infection in Teen agers in 2008 and 2010 (January to May).**

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 Mycoplasmas 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.

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