

Sexually transmitted diseases and *Chlamydia trachomatis* in women consulting for contraception

D. AVONTS

M. SERCU

P. HEYERICK

I. VANDERMEEREN

P. PIOT

SUMMARY. To study the frequency of genital infections in women consulting their family doctor for contraception, 248 women (median age 23 years) were examined for a range of genital microorganisms.

The prevalence of clue cells, *Candida albicans* and *Trichomonas vaginalis* were 21.0%, 12.9% and 2.0%, respectively. *Neisseria gonorrhoeae* was isolated in only one case, whereas *Chlamydia trachomatis* was found in 6.3% of women. A specific clinical picture for an infection with *C. trachomatis* in women was not seen.

Given the prevalence of over 5% for *C. trachomatis* and the absence of typical signs and symptoms in infected women, screening for this organism is recommended in women requesting an intrauterine contraceptive device, to prevent complications such as pelvic inflammatory disease and their sequelae.

Introduction

SEVERAL studies have demonstrated an increased risk for pelvic inflammatory disease and its complications such as ectopic pregnancy and tubal infertility in women using an intrauterine contraceptive device.^{1,2} Thus in one American study the incidence of pelvic inflammatory disease after insertion of a copper intrauterine contraceptive device was 15.5 and 1.5 per 1000 woman years for nulliparae and multiparae, respectively.³ However, in a similar British survey among married multiparae aged 25 years or older, and without a history of pelvic inflammatory disease, this incidence was only 0.9 per 1000 woman years.⁴ Such major differences in risk suggest that it is not the device itself which is responsible for the increased incidence of pelvic inflammatory disease in some populations, but that other factors such as the prevalence of infections with the causative agents of pelvic inflammatory disease — principally *Neisseria gonorrhoeae*, *Chlamydia trachomatis* and anaerobes — may play an important role. Unfortunately, information on genital infections in women enrolled in the above studies was not provided.

The fact that the highest risk for pelvic inflammatory disease occurs within the first month after insertion of the intrauterine device^{1,5} suggests that in this case it is caused by genital micro-

organisms entering the uterine cavity during the introduction of the device. Results from experiments in baboons confirm this.⁶

Nowadays intrauterine devices are inserted when the woman has no signs or symptoms of a genital infection. Given the considerations above, the present study aimed to determine the prevalence of sexually transmitted organisms in women who are consulting their family physician for contraception and who do not present with clear signs or symptoms of infection.

Method

The study was based in a group family practice in Ghent, Belgium, with two male doctors and one female doctor. During a period of four years (1981–84) all 141 women who requested a new or replacement intrauterine device and 107 women requesting follow-up oral contraception were enrolled in the study. Oral contraceptive users were selected as follows: after inclusion of a woman with a request for an intrauterine device, the next woman who came for follow up of oral contraception was enrolled.

At the initial visit, the women were specially questioned about genital signs and symptoms. A cervical specimen was taken with a cotton tipped metal swab (Medical Wire and Equipment) and placed into 2 SP medium for transportation and culture of chlamydia. A cervicovaginal specimen was transported in Amies medium (Medical Wire and Equipment) for the other microbiological investigations. Direct microscopic examination and a Gram stain were performed in order to detect clue cells. *N. gonorrhoeae* was cultured on modified Thayer Martin medium and *C. trachomatis* was isolated in cycloheximide treated McCoy cells.⁷ *Candida albicans* was cultured on Sabouraud agar, *Gardnerella vaginalis* on HBT medium,⁸ and *Trichomonas vaginalis* in trichomonas medium (Oxoid).

For statistical analysis chi-squared, Fisher's exact test and the 95% confidence interval of a difference and of a proportion were used. Test based confidence limits were used for the calculation of the 95% confidence intervals of odds ratios.

Results

The median age of the 248 participants was 23 years (range 15–36 years) with a median age at first sexual intercourse of 19 years (range 15–25 years). All women were sexually active at the time of the study: 22.6% had had intercourse with more than one sex partner in the last three months. Thirty two per cent were multigravidae and 15% multiparae. Some of the women (12.5%) already used an intrauterine device; oral contraception was used by 71.4%, condoms by 2.8%, and other methods or no contraception by 13.3%.

The reason for encounter for all participants was contraception and not genital complaints. A history of pelvic inflammatory disease was reported by 21 women (8.5%), five of them current users of intrauterine devices. Furthermore, 7.7% said they had noticed a vague low abdominal pain during the weeks before the study. When specifically questioned for complaints of vaginitis (vaginal odour, vulvovaginal irritation or vaginal discharge), 28.5% reported at least one of these symptoms.

During the gynaecological examination, cervical ectropion was seen in 30.8% of the women. Among the 221 women investigated by bimanual palpation 12 (5.4%) had an abnormality: cervical

D. Avonts, PhD, general practitioner associated with the Department of Microbiology and P. Piot, PhD, microbiologist and head of Department of Microbiology, Institute of Tropical Medicine, Antwerp, Belgium; M. Sercu, MD, P. Heyerick, MD and I. Vandermeeren, MD, general practitioners, 'Brugse Poort' Primary Health Care Centre, Ghent, Belgium.

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motion tenderness, very tender uterus, tender uterine adnexa or adnexal mass. Six out of the 12 women with an abnormal bimanual palpation (50.0%) had a history of pelvic inflammatory disease, compared with 12 out of the 209 (5.7%) with a normal bimanual palpation ($P=0.001$, Fisher's exact test).

Table 1 shows the microorganisms and clue cells found among the 248 women. A total of 111 women (44.8%) harboured an infectious microorganism. *N. gonorrhoeae* was isolated in only one woman, whereas *C. trachomatis* was found in 14 women. Only 223 cultures of *C. trachomatis* could be evaluated, thus the prevalence of *C. trachomatis* in this sample was 6.3% (95% confidence intervals 3.5–10.3). Among the 141 women requesting an intrauterine device, the prevalence of *C. trachomatis* was 7.5% (10 out of the 134 cultures that could be evaluated). Among the 14 women infected with chlamydia the mean age at presentation (23.2 years, standard deviation 2.3 years) and the mean age at first sexual intercourse (18.4 years, SD 1.9 years) were not significantly different from those of the non-infected women (23.8 years, SD 7.8 years and 18.9 years, SD 5.1 years, respectively). Other factors such as abnormal cervix, contraceptive use, gravidity and history of pelvic inflammatory disease did not correlate with the isolation of *C. trachomatis*.

Table 1. Prevalence of genital microorganisms and clue cells among 248 women consulting for contraception.

Microorganism or clue cell	Number (%) of women with infection	95% confidence interval ^a
Lactobacilli	129 (52.0)	(45.6–58.4)
<i>Gardnerella vaginalis</i>	60 (24.2)	(18.7–29.7)
Clue cells	52 (21.0)	(15.7–26.3)
<i>Candida albicans</i>	32 (12.9)	(8.5–17.3)
<i>Chlamydia trachomatis</i>	14 (6.3) ^b	(3.5–10.3)
<i>Trichomonas vaginalis</i>	5 (2.0)	(0.6–4.6)
<i>Neisseria gonorrhoeae</i>	1 (0.4)	(0.0–2.2)

^a Exact F-confidence intervals or approximate intervals if $P.N>5$.

^b 223 cultures of *C. trachomatis* could be evaluated.

In Table 2, the cases of *C. trachomatis* are shown in relation to three risk factors for a cervical infection with *C. trachomatis* — number of sex partners in the last three months, use of oral contraceptives and abnormal bimanual palpation. For all three risk factors the proportion of women with *C. trachomatis* was over twice the proportion without the risk factors. Nine of the 14 chlamydia-infected women had non-specific signs or symptoms of a genital infection, such as vulval irritation or vaginal discharge or odour. Two of them had an abnormal bimanual palpation.

Discussion

The prevalence of *C. trachomatis* in this sample of women attending for contraception (6.3%) is higher than the 1.7% found in a general practice in the United Kingdom⁹ and also higher than the 3% found in a family planning clinic.¹⁰ Studies among teenagers in the United States of America gave similar or higher isolation rates to this study.^{11–14} Among women with an unwanted pregnancy in Belgium, an isolation rate of 12% (95% confidence intervals 6–18%) was found.¹⁵ This prevalence may be representative for the frequency of *C. trachomatis* among young women in an urban area. The chlamydia prevalence rate found here is similar to the 8% (95% confidence intervals 4–14%) isolation rate in 162 American female students with comparable population characteristics.¹⁶

Table 2. Risk factors for cervical infection with *Chlamydia trachomatis*.

Risk factor	Total number of women	Number (%) with <i>C. trachomatis</i>	Odds ratio (95% confidence interval)
<i>Number of sex partners in the last 3 months</i>			
2+	55	6 (11)	2.5 (0.8–7.6)
0 or 1	174	8 (5)	
<i>Use of oral contraceptives</i>			
Yes	177	12 (7)	2.5 (0.3–18.6)
No	70	2 (3)	
<i>Abnormal bimanual palpation</i>			
Yes ^a	12	2 (17)	3.3 (0.2–44.2)
No	209	12 (6)	

^a When one or more of following signs were detected: cervical motion tenderness, very tender uterus, tender uterine adnexa or adnexal mass.

In the population studied, women with a cervical infection with *C. trachomatis* more often had an abnormal bimanual palpation. The predictive value of a positive finding (an abnormal palpation) for infection with *C. trachomatis* was 17% (2/12), whereas a negative finding (normal palpation) gave a predictive value of 94% (197/209). An abnormal bimanual palpation was also correlated with a history of pelvic inflammatory disease. Patients' history (sexual partners, contraceptive use) and the clinical examination (bimanual palpation) gave no support for a (specific) clinical entity for *C. trachomatis* infection in this population of asymptomatic women in primary care. Only detection of the organism in the cervix can reveal the infection.

It is not usual to screen women for *C. trachomatis* before the insertion of an intrauterine contraceptive device.¹⁷ However, an (asymptomatic) cervical infection with *C. trachomatis* may cause pelvic inflammatory disease in 8% of the infected women.¹⁸

The presence of clue cells, *G. vaginalis*, *C. albicans* or *T. vaginalis* is not related to pelvic inflammatory disease whereas *N. gonorrhoeae* and *C. trachomatis* are proven aetiological infectious organisms of the disease. It is possible that the ascent of these latter two microorganisms may be enhanced by the insertion of an intrauterine device, as suggested by the results from experiments in baboons.⁶ Finally, pelvic inflammatory disease may result in tubal infertility, an unwanted effect for women using reversible contraceptive methods. A high prevalence of *C. trachomatis* in women consulting for contraception is a matter of concern. Therefore, screening for the presence of *C. trachomatis* is recommended for women requesting insertion of an intrauterine contraceptive device.

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Address for correspondence

D. Avonts, Department of Microbiology, Institute of Tropical Medicine, Nationalestraat 155, B 2000 Antwerp, Belgium.

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