

Short Communication

Chlamydia trachomatis Antigen Positivity in Women in Risk Groups and Its Relationship with the Use of Antibiotics

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SUMMARY: The present study examined the use of antibiotics with respect to the rate of *Chlamydia trachomatis* positivity. Our subjects were 282 sexually active Turkish females between the ages of 15 and 42. Endocervical samples were investigated in 60 women with pelvic inflammatory diseases (PIDs), 90 infertile patients (IPs), 92 registered commercial sex workers (CSWs), and 40 intrauterine device (IUD) users. All samples were analyzed using direct immunofluorescence test techniques for the presence of *C. trachomatis* antigen, which was found in 12.7% of our subjects, with positive results as high as 26% in patients between 21 and 30 years of age. *C. trachomatis* positivity was found to be 16.6% in PID patients, 23.3% in IPs, and 5.4% in CSWs; however, it was not found among IUD users. The rate of positivity was highest in IPs, and lowest in registered CSWs ($P < 0.05$), who are periodically examined for the presence of sexually transmitted diseases, as required by Turkish authorities. Interestingly, the usage of therapeutic or prophylactic antibiotics such as tetracycline and ceftriaxon was found to be quite high among IUD users (90% use of tetracycline) and CSWs (100% use of both antibiotics). Our results show that *C. trachomatis* positivity in the southeast region of Turkey is not significantly higher than that found in previous studies on sex workers of other countries. Additionally, our results indicate that the use of prophylactic antibiotics decreases the rate of chlamydial infection.

Chlamydia trachomatis is an obligate intracellular Gram-negative bacterium that is responsible for a wide range of human diseases (1-3). Although *C. trachomatis* infections of the female genital tract are often asymptomatic (3), they are a major cause of pelvic inflammatory diseases (PIDs), tubal occlusion, and infertility (4). The control of chlamydial infection is an important public health issue (1,4). Genital chlamydial infections frequently persist for years, predominantly in an asymptomatic state with recurrent symptomatic episodes (2-6). Additionally, chlamydial infection which occurs in an estimated 15-40% of women, is frequently identified as the single cause of the PID (4-8). Earlier confirmation of chlamydial infections by direct immunofluorescent (DIF) test and enzyme immunoassay (EIA), especially in questionable cases of PID, will allow early diagnosis and treatment of the genital tract diseases caused by *C. trachomatis* (5). Thus, early administration of the appropriate antibiotics may be able to reduce developing chlamydial complications.

The aim of the present study was to investigate the presence of *C. trachomatis* antigen in women ($n = 282$) from four different risk groups who live in southeast Turkey. The study was carried out from September 1997 to October 1998. The subjects were selected from the patients at the Department of Obstetrics and Gynecology (outpatients and inpatients), the Parenthood Family Planning Center, and a brothel in Gaziantep City. The subjects ranged in age from 15 to 42 (mean 26 ± 11.2).

Obstetric and gynecological examinations were performed on all subjects and each patient was asked about her antibiotic usage in the previous 3 months. Cervical secretions were taken with cotton swabs from endocervical canal, and endocervical samples were examined for *C. trachomatis* antigen (3,5) columnar epithelial cells, intracellular diplococcus, polymorph nuclear cells. Since our laboratory facilities are not equipped for tissue culture or polymerase chain reaction techniques, testing was conducted by direct monoclonal immune fluorescence (Orgenium, Helsinki, Finland) (3,5) and by Micro Trak (Syva Co., Palo Alto, Calif., USA), following the manufacturer's instructions in each case. The first study group consisted of 60 patients with PIDs who had lower abdominal pain with mucopurulent discharge, and a medical history of chronic PID. The second group included 90 infertile patients (IPs), 48 of whom had been diagnosed with primary infertility, and 42 with secondary infertility. All IPs were followed for more than 1 year, and were diagnosed by radiological imaging methods such as hysterosalpingography, pelvic ultrasonography, and premenstrual probe (2). Their husbands had normal spermiograms. The third group consisted of 92 registered commercial sex workers (CSWs) who were selected during their official routine examination, which is required periodically by local authorities. And the fourth group included 40 intrauterine device (IUD) users, all of whom had normal gynecological examinations, and were followed up every month by the Parenthood Family Planning Center. Patients who were using anti-chlamydial antibiotics during the collection of samples or in the week prior to collection were excluded from the study. The chi-square technique was used to determine differences among the groups.

C. trachomatis antigen was positive in 12.7% of all

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Table 1. *Chlamydia trachomatis* antigen positivity in women and demographic findings

Women group (n)	Age means	Using antibiotic (%)	<i>C. trachomatis</i> antigen (+) ¹⁾ (%)
PID (60)	15-40 (32.4 ± 12.3)	42 (50.2)	10 (16.6)
IP (90)	19-39 (28.6 ± 11.4)	68 (75.5)	21 (23.3)
CSW (92)	21-42 (30.4 ± 6.9)	92 (100)	5 (5.4)
IUD (40)	18-40 (29.9 ± 9.3)	36 (90)	–
Total (282)	15-42 (26 ± 11.2)	238 (84.3)	36 (12.7)

¹⁾: All samples were analyzed using direct immunofluorescence test.

PID, patient with pelvic inflammatory disease; IP, infertile patient; CSW, commercial sex worker; IUD, intrauterine device user.

studied patients and was found in 16.6% of PID subjects, 23.3% of IPs, and 5.4% of CSWs, but was not detected in IUD users. The patients were asked about any previous history of genitourinary tract infection, as well as about any use of anti-chlamydial antibiotics such as tetracycline, doxycycline or azithromycin within the preceding 3 months.

Our demographic findings together with antigen positivity are shown in Table 1. *C. trachomatis* antigen positivity by age group is shown in Fig. 1.

Our findings indicate that *C. trachomatis* is an important pathogen in PIDs and in infertility, and that the effective use of antibiotics reduces its occurrence among CSWs and IUD users.

C. trachomatis has been reported and is accepted to be as an important cause of infertility (2) and ectopic pregnancy (4) as well as a cause of tubal damage (8). Additionally, *C. trachomatis* has been found in the endometrium of the fallopian tubes in approximately 25% of patients with acute salpingitis in the United States (1). Later studies have revealed that up to two-thirds of PID cases are associated with *C. trachomatis* infection (2), and that *C. trachomatis* is found in 38% of infertile women (4,6). Advancing genital infections are likely to develop into subclinical salpingitis (7,8). Interestingly, the *C. trachomatis* positivity rate in CSWs in the present study was lower than that found in another study performed in western Turkey (9). Furthermore, the rate of chlamydial infection in Turkey has been reported to be 34.4% among women and was found in 8% of registered female sex workers in Istanbul and in 25.4% of CSWs in Izmir (personal communication).

This discrepancy between the present and previous results may reflect prophylactic antibiotic usage by CSWs in the present case. Furthermore, *C. trachomatis* antigen was not

detected in IUD users. These patients informed us that they were frequently treated with doxycycline, and also CSW who were treated with ceftriaxon and tetracycline. IUD users were monogamous. In the region in question, men are polygamous but women are not; the lack of *C. trachomatis* antigen positivity may be a benefit of this monogamy among women.

Genç et al. (10) state that 7-day multidose regimens of tetracycline, doxycycline or erythromycin are the most frequently used treatments for genital chlamydial infections, which have been associated with bacteriologic cure rates between 61 and 98%.

In the present study, *C. trachomatis* positivity was found to be highest (26%) in young adults aged between 21 and 30, though in a previous study, the highest rates of *C. trachomatis* were found in sexually active teenagers (6). Recent studies also show that chlamydial infection and associated diseases are clearly correlated with younger age (3,7). One study suggests that routine screening for *C. trachomatis* infections can decrease the rate of infection (6), and indeed, through preventive measures, the prevalence of infected women between 15 and 29 years of age has been halved since 1984 in the United States (1). In Turkey, the average age of marriage is 18 to 24, and for women sexual life usually begins with marriage. We found that the rate of *C. trachomatis* infection was higher (26%) in infertile women between 21 and 30 years of age. In the region under study, it is very common for men to have sex with CSWs before marriage, and they may thus spread *C. trachomatis* infection to their wives. Unfortunately, we were unable to include husbands in the present study, but this issue will be addressed in future research.

Cervical infection with *C. trachomatis* is often asymptomatic, and patients with suspected infection can be treated on a presumptive basis. Women with mucopurulent endocervitis or salpingitis should be automatically treated for *C. trachomatis* infection. Screening, diagnosis, and treatment of symptomatic and asymptomatic patients are effective and economical, and are especially indicated in the case of PIDs.

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REFERENCES

- Schachter, J. (1998): *Chlamydia*. p. 975-980. In Gorbach, S. L., Bartlett, J. G., Blacklow, N. R., (eds.), Infectious Diseases. Part VI. WB Saunders Co., Philadelphia.
- Paavonen, J. and Lehtinen, M. (1996): *Chlamydial pelvic*

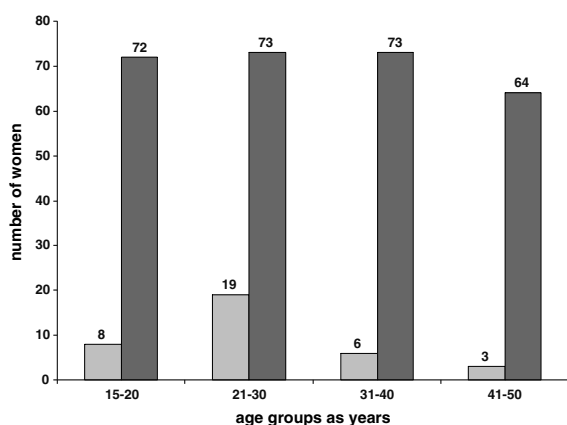


Fig. 1. *C. trachomatis* positive as age groups in the women. *C. trachomatis* positive of women (□), total number of women as age groups (■).

- inflammatory disease. Hum. Reprod. Update, 2, 519-529.
3. Hansfield, H. (1998): Screening asymptomatic women for *Chlamydia trachomatis*. JAMA, 280, 1800-1801.
 4. Sands, P. (1992): *Chlamydia trachomatis* disease spectrum. Br. J. Sex. Med., Suppl., 3-6.
 5. Chernesky, M. A., Mahony, J. B., Castriciano, S. et al. (1986): Detection of *Chlamydia trachomatis* antigens by enzyme immunoassay and immunofluorescence in genital specimens from symptomatic and asymptomatic men and women. J. Infect. Dis., 154, 141-148.
 6. Torwald, J. R. (1990): Epidemiological control of genital *Chlamydia trachomatis* infection. Scan. J. Infect. Dis., Suppl. 69, 157-167.
 7. Garrow, S. C., Smith, D. W. and Harnett, G. B. (2002): The diagnosis of *Chlamydia gonorrhoea* and *C. trichomonas* infections by self obtained low vaginal swabs in remote northern Australian clinical practice. Sex. Transm. Infect., 78, 278-281.
 8. Godoura, R., Keskes, A. L., Bouzid, F., Eb, F., Hammami, A. and Orfila, J. (2001): *Chlamydia trachomatis* and male infertility in Tunisia. Eur. J. Contracept Reprod. Health Care, 6, 102-107.
 9. Agacfidan, A., Chow, J. M., Pashazade, H., Ozarmagan, G. and Badur, S. (1997): Screening of sex workers in Turkey for *Chlamydia trachomatis*. Sex. Transm. Dis., 24, 573-575.
 10. Genç, M. and Mårdh, P. A. (1996): A cost effectiveness analysis of screening and treatment for *Chlamydia trachomatis* infection in asymptomatic women. An. Int. Med., 124, 1-7.