

# Prevalence of genital chlamydia in Iranian males with urethritis attending clinics in Mashhad

J. Ghanaat,<sup>1</sup> J.T. Afshari,<sup>2</sup> K. Ghazvini<sup>1</sup> and M. Malvandi<sup>1</sup>

معدّل انتشار المتدثرات التناسلية بين الإيرانيين الذكور المصابين بالتهاب الإحليل، المترددين على عيادات مشهد

جواد قناعت، جليل توكل أفشاري، كيارش قزويني، مسعود ملوندي

**الخلاصة:** تُعد المتدثرة الحثريّة من الأسباب الشائعة لحدوث الأمراض المنقولة جنسياً والتي يمكن أن تسبب عواقب وخيمة. وتتطلب الوقاية الفعّالة توافر معلومات حول معدّل انتشار العدوى بُعْية استهداف المداخلات استهدافاً فعّالاً لقاء التكاليف. وقد أجريت هذه الدراسة بين الذكور المصابين بالتهاب الإحليل بُعْية تحديد معدّل انتشار العدوى بالمتدثرات في مشهد، في شمال شرقي جمهورية إيران الإسلامية. وأُخذت العينات من النسيج الإحليلي من 150 مريضاً. وأُجريت مزرعة خلوية لتشخيص المتدثرات في العينات التناسلية. وأظهرت نتائج المزرعة الخلوية أن 9.3% من المرضى في هذه الدراسة مصابون بالمتدثرات. وتقدّم هذه الدراسة بينات قوية على انتشار المتدثرات في إقليمنا، مما يستلزم تحريّ العدوى بها ومعالجتها.

**ABSTRACT** Chlamydia *trachomatis* is a common cause of sexually transmitted disease which can cause severe consequences. Effective prevention requires knowledge of prevalence of infection in order to target interventions in a cost-effective manner. To determine the prevalence of chlamydial infection in Mashhad, northeastern Islamic Republic of Iran, this study was performed among male patients with urethritis. Urethral discharge was collected from 150 patients. Cell culture was established for diagnosis of *Chlamydia* in genital specimens. Cell culture showed that 9.3% of patients in this study were infected with *Chlamydia*. This study provides strong evidence that prevalence of *Chlamydia* in our region is quite high, which necessitates screening and treatment for the infection.

## Prévalence des infections génitales à *Chlamydia* chez des Iraniens atteints d'urétrite et soignés dans des centres de santé de Mashhad

**RÉSUMÉ** *Chlamydia trachomatis* est une cause courante de maladie sexuellement transmissible susceptible d'avoir des conséquences graves. Pour assurer une prévention efficace, il est nécessaire de connaître la prévalence de l'infection afin de cibler les interventions de façon économiquement rationnelle. Cette étude, qui visait à déterminer la prévalence de l'infection à *Chlamydia* à Mashhad (nord-est de la République islamique d'Iran), a été réalisée auprès de patients de sexe masculin atteints d'urétrite. Un écoulement urétral a été recueilli chez 150 patients. Une culture cellulaire a été réalisée aux fins du diagnostic de *Chlamydia* dans les prélèvements génitaux. Cette culture a montré que 9,3 % des patients inclus dans l'étude présentaient une infection à *Chlamydia*. D'après l'étude, de nombreux éléments indiquent que la prévalence de *Chlamydia* dans notre région est assez élevée, et il est donc nécessaire de dépister et de traiter l'infection.

<sup>1</sup>Department of Microbiology and Virology; <sup>2</sup>Division of Immunology, Mashhad University of Medical Sciences, Mashhad, Islamic Republic of Iran (Correspondence to K Ghazvini: kiarash\_ghazvini@yahoo.com).

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## Introduction

Sexually transmitted infections are currently a major and expanding public health problem; they represent a vast social and economic drain. Whilst classical venereal diseases such as syphilis and gonorrhoea are in decline due to early detection and treatment, their place has now been taken by other groups of infectious agents, the most prevalent of which is *Chlamydia trachomatis* [1]. In particular, chlamydial genito-urinary infection in males is currently recognised as the leading cause of non-gonococcal urethritis and epididymitis, as well as contributing to male infertility or sub-fertility [2,3]. Appropriate measures need to be taken to prevent the spread and consequences of this infection.

Effective prevention requires knowledge of the prevalence of the infection in order to target interventions in a cost-effective manner. Although primary prevention of this infection through avoidance of multiple sex partners and the use of condoms is the most desirable approach, secondary prevention of sequelae through detection and treatment of infected symptomatic and asymptomatic individuals plays an important role as well [4,5]. It is also important that, when a chlamydial infection is diagnosed, it can be easily treated and cured: prompt diagnosis decreases the incidence of complications in those affected [6]. Programmes for screening and subsequent treatment are needed and a successful programme must include comprehensive knowledge of prevalence of chlamydial infections.

To determine the prevalence of chlamydial infection in the northeast of the Islamic Republic of Iran, this study was performed among male patients with urethritis in Mashhad. To our knowledge, no previous study has described the prevalence of chlamydial infection in this region.

## Methods

This study was carried out at Bu-Ali Research Institute, Mashhad University of Medical Sciences, during the period October 2000–November 2003. Urethral specimens were collected from all symptomatic male patients attending 2 sexually transmitted infection (STI) clinics (1 university hospital clinic and 1 private STI clinic, Monday and Wednesday clinics) and presenting with urethritis [urethral discharge or  $\geq 4$  polymorphonuclear leukocytes per microscope field ( $\times 1000$  magnification) in a Gram-stained urethral smear]. Specimens for chlamydial culture were obtained by inserting a cotton swab on an aluminium shaft 2 cm into the urethra and rotating it before withdrawal. Swabs were placed into chlamydia transport medium (minimal essential medium containing 25 mM HEPES, 5.4 mM sodium bicarbonate, 10  $\mu\text{g}/\text{mL}$  of gentamicin, and 0.6% bovine serum albumin) and transported at 4 °C to the Bu-Ali Research Laboratory for isolation of *C. trachomatis* in McCoy cells [7]. Two swabs were collected from each subject.

Informed consent was given by the participants. The study did not interfere with their treatment, and the patients' rights and welfare were properly protected.

Specimens were inoculated onto cycloheximide-treated monolayers of McCoy cells (obtained from the Pasteur Institute of Iran and subcultured at the Bu-Ali Research Institute) in tissue culture vessels within 24 hours of collection. After incubation at 35 °C in a fully humidified 5% CO<sub>2</sub> cabinet for 3 days, 1 of the vessels was fixed with methanol and stained using a fluorescent-antibody technique with *C. trachomatis* monoclonal antibody (primary passage). All cell monolayers were examined on the day of inoculation for confluent growth and only those with confluent growth were

inoculated. Each specimen was inoculated in parallel into 2 vessels. The second vessel was disrupted by scraping and was blind passaged onto fresh McCoy cell monolayers (second passage). A positive cell culture was any specimen that yielded  $\geq 1$  fluorescent antibody-stained inclusions detected in either the primary or second passage. Although some factors such as specimen collection, transport to the laboratory and time elapsed before inoculation might influence the result of culture examination, we tried to minimize the potential effect of each of these factors by strict adherence to the study protocol.

Frequency and prevalence of *C. trachomatis* among the male patients with urethritis were calculated and analysed using SPSS, version 11 [8].

## Results

A total of 150 men attending STI clinics were tested for *C. trachomatis* by culture: 14 specimens (9.3%) were diagnosed as positive (Table 1), 8 were weakly positive, having  $< 10$  inclusions, whereas the other 6 yielded more inclusions on staining and were diagnosed as strong positive.

Most of the men (104 of 150) were aged 20–30 years and 85.7% of the infections

were in this age group. As specimens were obtained from men attending STI clinics, all of the participants were symptomatic. Urethral discharge, burning micturition, genital ulcer and urethral itching were the most common symptoms reported. Among the 14 chlamydia-infected patients, 12 had urethral discharge and 11 complained of urethral itching. In total, 19 of the 150 patients had gonococcal urethritis but none of the 14 who were positive for chlamydial urethritis had associated gonococcal urethritis.

## Discussion

The prevalence of *C. trachomatis*, as determined in several areas of the world, varies according to geographic area, age and status of patients [1,9]. Even though the true epidemiology of chlamydial infections is not known, several studies have shown that the incidence of infection in different population ranges from 8% to 40%, and it is particularly on the increase among adolescents [10,11]. In some developed countries, the prevalence of *C. trachomatis* genital infection ranges from 1% to 25%, considering sexual orientation, number of partners and socioeconomic status of patients [12,13]. Perhaps because of social conservatism in Iranians regarding free sexual attitudes, the prevalence of sexually transmitted diseases, including *C. trachomatis* genital infection, may not be as high as in more-developed countries; our results show that the prevalence of this infection is high enough that appropriate preventive strategies for *C. trachomatis* should be considered in our country. According to previous studies carried out in Tehran, 8.8% and 8.4% of male patients attending STI clinics for urethritis were infected with *Chlamydia* [14,15]. In our study in Mashhad, the total prevalence was higher at 9.3%. Our findings also highlight the fact that most

Table 1 Age distribution of subjects positive for *Chlamydia trachomatis* by cell culture

Age (years)	+ve in age group		+ve in total	
	No.	%	No.	%
< 20 (n = 8)	0	–	0	–
20–29 (n = 104)	12	11.5	12	85.7
30–39 (n = 32)	2	6.2	2	14.2
$\geq 40$ (n = 6)	0	–	0	–
Total (n = 150)	14	9.3	14	100.0

patients with chlamydial infection belong to the young and sexually-active age group, 20–30 years.

Strong evidence is now available that chlamydia screening and treatment not only reduces the prevalence of lower genital tract infection, but also decreases the incidence of costly complications in affected people. Untreated, chlamydia can cause severe, reproductive and other health problems, which include both short- and long-term consequences [6]. It has been estimated that every \$US 1 spent on screening and treatment saves \$US 12 in complications that result from untreated chlamydia [16].

Our finding strongly indicate there is a need for chlamydia screening and treatment the Islamic Republic of Iran, similar to what is recommended in developed countries

[17]. Appropriate tests for detecting genitourinary chlamydial infections should be routine in STI investigations [18]. This strategy should be emphasized because chlamydial infection usually produces symptoms far less severe than other causes of urethritis, so the infection could go undetected for a very long time with a minimum of patient awareness until secondary or tertiary problems arise [19,20].

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### References

1. *Global prevalence and incidence of selected curable sexually transmitted diseases: overview and estimates*. Geneva, World Health Organization, 2001.
2. Jacobs NF, Arum ES, Krauss SJ. Non-gonococcal urethritis: the role of *Chlamydia trachomatis*. *Annals of internal medicine*, 1977, 86:313–4.
3. Holmes KK et al. Etiology of non-gonococcal urethritis. *New England journal of medicine*, 1975, 292:1199–2005.
4. Kilic D et al. Prevention and treatment of *Chlamydia trachomatis*, *Ureaplasma urealyticum*, and *Mycoplasma hominis* in patients with non-gonococcal urethritis. *Japanese journal of infectious diseases*, 2004, 57(1):17–20.
5. Brook MG, Bell C. Screening for non-gonococcal urethritis. *International journal of STD & AIDS*, 2004, 15(1):69.
6. Mayer BM, Berger RE. Sexually transmitted diseases in males. In: Tanagho EA, McAninch JW, eds. *Smith's general urology*, 15th ed. New York, Appleton & Lange, 2000:259–65.
7. Alani MD et al. Isolation of *Chlamydia trachomatis* from the male urethra. *British journal of venereal diseases*, 1977, 53:88–92.
8. Dunlop EMC. *Chlamydial infection; terminology, disease and treatment*. *Recent advances in sexually transmitted diseases*. Edinburgh, Churchill Livingstone, 1980:101–19.
9. Gauschino S, De Seta F. Update on *Chlamydia trachomatis*. *Annals of the New York Academy of Science*, 2000, 900:293–300.
10. Cates W, Wasserheit JN. Genital chlamydial infections: epidemiology and reproductive sequelae. *American journal of obstetrics and gynecology*, 1991, 164:1771–81.
11. Bavastrelli M et al. Sexually active adolescents and young adults: a high risk group

- for *Chlamydia trachomatis* infection. *Journal of travel medicine*, 1998, 5:57–60.
12. Washington AE et al. Incidence of *Chlamydia trachomatis* infections in the United States: using reported *Neisseria gonorrhoea* as a surrogate. In: Oriol D et al., eds. *Chlamydial infections*. Cambridge, Cambridge University Press, 1986, 487–90.
  13. Massari V, Dorleans Y, Flahault A. Persistent increase in the incidence of acute male urethritis diagnosed in general practices in France. *British journal of general practice*, 2006, 56(523):110–4.
  14. Darougar S et al. Chlamydial urethral infection in Teheran. A study of male patients attending an STD clinic. *British journal of venereal diseases*, 1982, 58(6):374–6.
  15. Badami N. *Prevalence of chlamydia trachomatis in attendants to STD clinics of Tehran University of Medical Sciences* [thesis]. Tehran, School of Public Health, Tehran University of Medical Sciences, 1992 [in Farsi].
  16. Blake DR, Gaydos CA, Quinn TC. Cost-effectiveness analysis of screening adolescent males for *Chlamydia* on admission to detention. *Sexually transmitted diseases*, 2004, 31(2):85–95.
  17. La Montagne DS et al. Re-evaluating selective screening criteria for chlamydial infection among women in the US Pacific Northwest. *Sexually transmitted diseases*, 2004, 31(5):283–9.
  18. Paukku M et al. Criteria for selective screening for *Chlamydia trachomatis*. *Sexually transmitted diseases*, 2003, 30(2):120–3.
  19. Tebb KP et al. To screen or not to screen: prevalence of *C. trachomatis* among sexually active asymptomatic male adolescents attending health maintenance pediatric visits. *Journal of adolescent health*, 2004, 34(3):166–8.
  20. Foo C, Browne R, Boag F. Retrospective review of the correlation of symptoms, signs and microscopy with the diagnosis of *Chlamydia trachomatis* in men. *International journal of STD & AIDS*, 2004, 15(5):319–21.
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