In the name of God

Shiraz E-Medical Journal
Vol. 12, No. 2, April 2011

http://semj.sums.ac.ir/vol12/apr2011/89026.htm

Prevalence of Genital Chlamydia Trachomatis Infection among Gynaecologic Clinic Attendees in Jos, Nigeria.

Mawak J.D*, Dashe N**, Agabi Y.A*, Panshak B.W*.

* Department of Microbiology Faculty of Natural Sciences University of Jos P.M.B. 2084 Jos, Nigeria.** Department of Medical Microbiology Faculty of Medical Sciences University of Jos P.M.B. 2084 Jos, Nigeria.

Correspondence: Dr. John Mawak, Associate Professor, Microbiology, University of Jos, Nigeria, Telephone: +234(073) 8035-889-368, E-mail: johnmawak@yahoo.co.uk

Received for Publication: July 26, 2010, Accepted for Publication: February 20, 2011.

Abstract:

Background: Chlamydia trachomatis is the most common cause of sexually transmitted venereal infection in the world. There is little information about the prevalence of C trachomatis in Jos, Nigeria.
Objectives: The study was carried out to determine the prevalence of C trachomatis infection in women attending the gynaecology clinic of the Plateau State Specialist Hospital and to assess the variables associated with the infection.
Methods: A questionnaire was administered, followed by collection of endocervical swabs from patients who gave their consents using sterile plastic-shaft Dacron swabs. Collected samples were analyzed using Chlamydia Rapid Test Device- Swab/Urine (INTERCHEMICAL LTD. CHINA).
Results: Samples were collected from a total of 164 women, aged between 14 and 45 years. Ninety two (56.1% of total sample) tested positive for C trachomatis. The prevalence was slightly higher in patients within the age group 25-29 (17.68%) than in the age group 20-24 (15.24%). Both age groups 15-19 and 30-34 had a prevalence of 7.93% each. The age groups 35-39, 40-44, 45-49 and <15 had prevalence of 3.66%, 3.05%, 0.16%, and 0.00% respectively. Married women were related to a higher percentage of infection than single women: 38.41% versus 17.07%. Age of onset of sexual activity played a role in infection with C trachomatis. Women who started having sex earlier in life had a higher prevalence. History of other sexually transmitted diseases was found to be significantly associated with genital C trachomatis infection (41.46%) ($P<0.05$). Fourteen percent of the women had history of infertility, 26.22% spontaneous abortion, 22.12% pelvic inflammatory disease (PID) and 42.68% had more than one sexual partner (past/present).
Conclusion: A 56.1% prevalence of C trachomatis genital infection was found. Awareness campaigns and Chlamydia screening and monitoring activities should be initiated and supported by the government.

Keywords: Chlamydia trachomatis, endocervical swabs, Jos, Nigeria

Introduction:

Chlamydia trachomatis is a small Gram-negative bacterium that is an obligate intracellular parasite.[1] Genital C trachomatis infection is an established cause of pelvic inflammatory disease (PID), ectopic pregnancy and infertility among women.[2] It is the most common bacterial sexually transmitted disease in the world.[3, 4] Asymptomatic infection is common among both men and women, and to detect chlamydial infections health-care providers frequently rely on screening tests.[5] In many developed countries, screening programmes for Chlamydia have been set up to reduce transmission and reproductive tract morbidity.[6] The United States Centres for Disease Control and Prevention recommend annual screening of all sexually active women aged 25 or less[5, 7], as is screening of older women with risk factors (for example, those who have a new sex partner or multiple sex partners).

In the United States, chlamydial genital infection is the most frequently reported infectious disease, and the prevalence is highest in persons aged <25 years.[8] Approximately 4 million cases of chlamydial infections are reported per year with an overall prevalence of 5%. A prevalence as high as 14% was reported in African-American females aged 18-26 years.[9] During 2007, approximately 1.1 million cases of Chlamydia were reported to CDC; more than half of these were in females, aged 15-25 years.[10]

In most parts of Nigeria, C trachomatis are not routinely screened for, and hence relative information about frequencies of the organisms is sparse.[11] A 51% prevalence among pregnant and non-pregnant women and their spouses attending pre and antenatal clinic in the College of Medicine of the University of Lagos has been reported.[12] A slightly lower prevalence of 40.7% of C trachomatis has also been reported from the South-Eastern part of Nigeria.[11] Other lower prevalence of 38.3% in Zaria[13] and 13.3% in Benin City[14] have also been recorded. This study aimed to identify C trachomatis prevalence in Jos, Nigeria, and explore which are the most important factors affecting prevalence estimates.

Material and Methods:

Patient recruitment:

Participants were female volunteers aged 14-45 years attending the Gynaecology clinic in Plateau State Specialist Hospital (PSSH). A consent form and a brief self-administered questionnaire, including demographic details and questions on sexual behaviour, history of STI and urogenital symptoms were completed by each consented participant.

Sample collection and analysis:

Endocervical swabs were collected from 164 consented patients using sterile plastic-shaft Dacron swabs. Collected samples were analyzed using Chlamydia Rapid Test Device -Swab/Urine (Interchemical Ltd. China). The Chlamydia Rapid Test Device (Swab/Urine) is a qualitative, lateral flow immunoassay for the detection of Chlamydia antigen from female cervical swab, male urethral swab and male urine specimens. In this test, antibody specific to the Chlamydia antigen is coated on the test line region of

the test. During testing, the extracted antigen solution reacts with an antibody to Chlamydia that is coated onto particles. The mixture migrates up to react with the antibody to Chlamydia on the membrane and generates a coloured line in the test line region. The presence of this coloured line in the test line region indicates a positive result, while its absence indicates a negative result. To serve as a procedural control, a coloured line will always appear in the control line region indicating that proper volume of specimen has been added and membrane wicking has occurred.[15] The test procedure was conducted according to the manufacturer's instruction manual described in 1993[16] and 1994.[17]

Statistical analysis:

Pearson Chi–Square was used to analyze the result. Statistical significance was accepted at P<0.05 (95% confidence level).

Results:

A total of 164 samples were tested for Chlamydia trachomatis, out of which 92 (56.1%) were found to be positive (Table 1).

The prevalence of genital C trachomatis in relation to age is also shown in table 1. Infection was found to be slightly higher in the age groups 25-29 (17.68%) than in the age group20-24 (15.24%). The age groups 15-19 and 30-34 both had a prevalence of 7.93%.age groups 35-39, 40-44, and 45-49 had 3.66%, 3.05% and 61% respectively.

Married women had the highest prevalence (38.41%) than the singles (17.07%) and the divorced (0.61%) (Table 2).

The prevalence of C trachomatis in relation to age of onset of sexual activity was found to be 7.32% in the age group <15, 40.24% in the age group 15-19, 6.71% in the age group 20-24 and 1.83% in the age group 25-29 (Table 3).

History of infertility and pelvic inflammatory disease, other sexually transmitted diseases and spontaneous abortion were associated with 14.02%, 41.46% and 26.22% of infection with C trachomatis respectively (Table 4).

Having Greater than one number of sexual partners was associated with 49.88% of the positive patients for C trachomatis infection.

Table 1: Prevalence of Chlamydia trachomatis infections in relation to age

Age group (Years)	Number examined	Number (%) Positive
<15	1	0 (0.00)
15-19	20	13 (7.93)
20-24	49	25 (15.24)
25-29	47	29 (17.68)
30-34	23	13 (7.93)
35-39	13	6 (3.66)
40-44	9	5 (3.05)
45-49	2	1 (0.61)
Total	164	92 (56.10)
		P=0.000

Table 2: Prevalence of Chlamydia trachomatis in relation to Marital Status

Status	Number examined	Number (%) Positive
Married	107	63 (38.41)
Single	54	28 (17.07)
Separated or Divorced	3	1 (0.61)
Total	164	92 (56.10)
		P=0.000

Table 3: Prevalence of Chlamydia trachomatis in relation to age of onset of sexual activity

Age of onset of sexual Activity (Years)	Number examined	Number (%) Positive
<15	15	12 (7.32)
15-19	104	66(40.24)
20-24	37	11 (6.71)
25-29	8	3 (1.83)
Total	164	92 (56.10)
		P=0.147

Table 4: Prevalence of Chlamydia trachomatis in relation to other health factors

Factor	Number examined	Number (%) Positive
History of infertility	28	23 (14.02)
History of other STDs	96	68 (41.46)
History of abortion	60	43 (26.22)
History of PID	30	23 (14.02)

Discussion:

Genital Chlamydia infection is generally considered a silent infection in women. This study consisted of 164 patients attending the Gynaecology Clinic in the Plateau State Specialist Hospital, Jos Nigeria. They could be considered a low risk group since about 70-90% of infected women show no symptoms[18, 19] and are usually not treated. It has previously been reported that relative frequencies in developing countries are scanty and infection could be higher in developing countries.[20] As diagnoses for chlamydial infection are not usually carried out, most infections caused by Chlamydia is usually taken for other infections. Also, since Chlamydia sp are usually found in latent infection, the infections pass unnoticed and remain endemic in the population for a long time.[11]

A prevalence of 56.10% was found in this study. This is consistent with a prevalence of over 51% among pregnant and non pregnant women and their spouses reported by Okoro[12] in 2000 at the College of Medicine of the University of Lagos. Also, a prevalence of 41% was reported in South- Western Nigeria.[11] A slightly lower prevalence of 38.3% has been reported in Ahmadu Bello University Teaching Hospital, Zaria.[13]

Although prevalence of chlamydial infection as low as 9% in Maiduguri[17] and 10% in Ibadan[21] were reported in contrast with the higher prevalence obtained in recent studies, the reason could be

that, as the infection remained endemic, its spread could be on the increase. It could also be as a result of increase in the sexual risk behavioural attitudes of individuals in our society.

The prevalence of genital C trachomatis infection found in this study (and others in other parts of Nigeria) is very high compared to those in the developed countries. In asymptomatic women in Europe, it ranged from 1.7-17% depending on the setting, context and country.[22] In the USA, a representative survey of adults aged 18-26 years found prevalence of 4.7% [23] and in Australia, prevalence of 7.5% and 5.6% were found among indigenous and urban young adults respectively.[24, 25]

This marked difference could be as a result of reduced sexual risk-behaviour, increased awareness on Chlamydia infection and other sexually transmitted diseases, easy access to laboratory, diagnoses and treatment among others in developed countries of which the reverse is the case in developing countries.

Previous epidemiological studies on chlamydial infection have identified a variety of risk factors, including the number of partners, an age under 25 years, cervical ectopy, concurrent gonococcal infection, a history of sexually transmitted diseases, HIV seropositivity and seroconversion, the duration of prostitution, and the lack of condom use.[26, 27, 28] In our study, risk determinant analysis showed that age, marital status, age of onset of sexual activity, number of sexual partners, and history of other STIs were risk factors for C. trachomatis infection; however, significant association was found only with history of other STDs.

Analysis of age related prevalence of C trachomatis infection in this study showed that patients in the age group 25-29 had a prevalence of 17.68% which is slightly higher than that in the age group 20-24 (15.24%). These age groups fall within the sexually active and adolescent age which could be the reason for the higher prevalence in these groups.[11]

In relation to marital status, married women had highest prevalence (38.41%) than the singles (17.07%) and the divorced (0.61%). This may account for the cases of spontaneous abortion (26.22%) and infertility (14.02%) in this study.

Age of onset of sexual activity determined in this study had the age group 15-19 with the highest prevalence of 40.24%. This implies that the earlier an individual engaged in sexual activity, the higher the chances of being infected with C trachomatis. Twenty three out of the 28 patients with history of infertility were positive for C trachomatis. Chlamydia trachomatis could be the cause of infertility in this these patients.

Although number of sexual partners has been found to be statistically associated with C trachomatis infection in other previous study [29], the 49 (29.88%) of 70 with multiple sexual partner who tested positive for C trachomatis was not statistically significant. The important role of this factor cannot be underscored. For those that answered one partner to the question of 'Number of sexual partners' and tested positive, there is an uncertainty of whether or not their spouses maintained single sexual partner in addi-

tion to the practice of polygamy in this part of Nigeria.

Genital C trachomatis infection is highly prevalent in this part of Nigeria and should be considered a silent epidemic that needs urgent attention. Since there is no available protective vaccine against Chlamydial infections, and untreated infection can cause irreversible damage to female reproductive system including infertility, there is a need for the Government to develop and implement Chlamydial control strategies.

References:

1. McAdam AJ and Sharpe AH. Infectious Diseases. In: Kuma V, Abbas AK, and Fausto N. Robbins and Cotran Pathologic basis of disease. 7th edition, Elsevier Sanders Philadelphia, Pennsylvania 2005: 343-414.

2. Oakeshott P and Hay P. General Practice Update: Chlamydia infection in women. Br J Gen Pract. 1995; 45 (400): 615–620.

3. StammWE. Chlamydia trachomatis infections: progress and problems. J Infect Dis; 1999; 179: S380–383.

4. Coonrod DV Chlamydial infections. Curr womens Health Rep 2002; 2 (4): 266-75.

5. U.S. Preventive Services Task Force. Screening for chlamydial infection: recommendations and rationale. Am J Prev Med 2001; 20 (Suppl 3): 90-94.

6. European Centre for Disease Prevention and Control. Chlamydia control in Europe. ECDC, 2009.

7. CDC. Sexually Transmitted Diseases Treatment Guidelines. MMWR 2006; 55: 56-7.

8. CDC. Sexually Transmitted Disease Surveillance, 2004. Atlanta, GA: U.S. Department of Health and Human Services, CDC, National Centre for HIV, STD, and TB Prevention; 2005.

9. Houry D. Chlamydia. 2006. Available at http://www.emedicine.com/emerg/topic925.htm.

10.CDC. Sexually transmitted disease surveillance, 2007. Atlanta, GA: US Department of Health and Human Services, CDC; 2009. Available at http://www.cdc.gov/std/stats07/toc.htm.

11. Okoror LE, Agbonlahor DE, Esumeh FI, and Umolu PI. Prevalence of Chlamydia in patients attending gynaecological clinics in south eastern Nigeria. Afr Health Sci. 2007; 7 (1): 18–24.

12. Okoror, L.E, Omilabu, S.A., Fadojutimi, J.and Nsongkhai, V. (2000): Seroepidemiological survey of Chlamydia in patients attending pre and post natal clinic at the College of Medicine of the University of Lagos, Nigeria. In: Book of Abstract of the 24th annual conference of the Nigerian Society for Microbiology.

13. Tukur J, Shittu SO, Abdul AM. A case control study of active genital Chlamydia trachomatis infection among patients with tubal infertility in northern Nigeria. Trop Doct. 2006; 36 (1): 14-6.

14. Isibor JO, Ugbomoiko D, Nwobu GO, Ekundayo AO, Enweani IB, Okogun GRA. Detection of chlamydia antigen in cervical specimens from antenatal clinic attendees in Benin City, Nigeria. African Journal of Clinical and Experimental Microbiology. 2005; 6 (3): 208-211.

15. Chlamydia Antigen Rapid test (Inter-Chemical (Shenzhen) Ltd) available on http://interchemicallab.en.ecplaza.net/9.asp.

16. Jaschek G, Gaydos CA, Welsh LE, Quinn TC. Direct detection of Chlamydia trachomatis in urine specimens from symptomatic and asymptomatic men by using a rapid polymerase chain reaction assay. J Clin Microbiol. 1993; 31: 1209-1212.

17. Sanders JW, Hook EW, Welsh LE, et al. Evaluation of an enzyme immunoassay for detection of Chlamydia trachomatis in urine of asymptomatic men. J Clin Microbiol. 1994; 32: 24-27.

18. Amin J D, Zaria L T, el-Nafaty A U, Mai A M Genital Chlamydia trachomatis infection in women in a Nigerian hospital. Genitourin Med. 1997; 73: 146-147.

19. Nelson H D and Helfand M. Screening for chlamydial infection. Am J Prev Med. 2001; 20 (3 Suppl): 95-107.

20. Krivoshein YS. Handbook on Micro Laboratory Diagnosis of Infectious Diseases. MIR Publishers, Moscow, 1989.

21. Darougar S, Forsey T, Osoba A O, Dines R J, Adelusi B, Coker G O. Chlamydial genital infection in Ibadan, Nigeria. A seroepidemiological survey. Br J Vener Dis. 1982; 58: 366-369.

22. Wilson JS. Honey E, Templeton A, Paavonen J, Mårdh PA, Stary A and Stray-Pedersen B for the EU Biomed Concerted Action Group. A systematic review of the prevalence of Chlamydia trachomatis among

European women. Human Reproduction Update. 2002; 8 (4): 385-394.

23. Miller WC, Ford CA, Morris M, Handcock MS, Schmitz JL, Hobbs MM, Cohen MS, Harris KM, Udry JR. Prevalence of chlamydial and gonococcal infections among young adults in the United States. JAMA. 2004; 291 (18): 2229-2236.

24. Vajdic CM, Middleton M, Bowden FJ, Fairley CK, Kaldor JM. The prevalence of genital Chlamydia trachomatis in Australia 1997-2004: a systematic review. Sex Health. 2005; 2 (3): 169-83.

25. Bandea CI, Debattista J, Joseph K, Igietseme J, Timms P, and Black CM Chlamydia trachomatis Serovars among Strains Isolated from Members of Rural Indigenous Communities and Urban Populations in Australia. Journal of Clinical Microbiology. 2008; 46 (1): 355-356.

26. Brunham, R. C., J. Kimani, J. Bwayo, G. Maitha, I. Maclean, C. L. Yang, C. X. Shen, S. Roman, N. J. D. Nagelkerke, M. Cheang, and F. A. Plummer. 1996. The epidemiology of Chlamydia trachomatis within a sexually transmitted diseases core group. J. Infect. Dis. 173: 950–956.

27. Gaydos, C. A., M. R. Howell, B. Pare, K. L. Clark, D. A. Ellis, R. M. Hendrix, J. C. Gaydos, K. T. McKee, Jr., and T. C. Quinn. 1998. Chlamydia trachomatis infections in female military recruits. New Engl. J. Med. 339: 739–744.

28. Van Duynhoven, Y. T., M. J. van de Laar, W. A. Schop, J. W. Mouton, W. I. van der Meijden, and M. J. Sprenger. 1997. Different demographic and sexual correlates for chlamydial infection and gonorrhoea in Rotterdam. Int. J. Epidemiol. 26: 1373–1385.

29. Verhoeven V, Avonts D, Meheus A, Goossens H, Ieven M, Chapelle S, Lammens C, Van Royen P. Chlamydial infection: an accurate model for opportunistic screening in general practice. Sex Transm Infect 2003; 79: 313-317.