

Prevalence of *Chlamydia trachomatis* among Female Students attending a Selected University Health Services in Zaria, Kaduna State, Nigeria

¹Ella, ²E. E., ³Shenge, H. And ⁴Ajoge, H. O.
1,2,3,4,Department of Microbiology, Ahmadu Bello University, Zaria

ABSTRACT

The study area was the Health Services Sickbay of a tertiary institution in Zaria attended by staff and students as well as a population living within the academic community. However, the study population was limited to all the female students attending the within a period of six months who gave their consent to be enlisted in the study. Staff and non- students attending the health facility were excluded. Similarly approval for the study was obtained from the Authorities of the Health Centre. A total of 92 female students were analyzed and of this number, 26 representing 28.26% were seropositive. In respect to age distribution, it was found that 78 of the 92 students sampled were in the 18-23 age range where 23 (29.49%) of the 78 female students within the 18 – 23 age range were seropositive while 3(25%) out of the 12 female students in the 24-29 age range were seropositive. A prevalence of 28.21% (22 cases out of 78) was established for the unmarried female students to *Chlamydia trachomatis* IgG while the married had a prevalence of 28.57 % (4 out of 14 cases). From the result obtained in this study, it can be seen that the prevalence of *Chlamydia trachomatis* was quite high for an enclosed population of women.

KEYWORDS: Seroprevalence, Elisa, *Chlamydia trachomatis*, IgG

Date of Submission: 25 October 2013



Date of Acceptance: 30 November 2013

I. INTRODUCTION

Chlamydia trachomatis was the first *Chlamydia* agent discovered in humans (Ryan and Ray, 2004) and was referred to as a large virus because of its obligate parasitic living. It is a worldwide infection highly prevalent among the sexually active age group and also, studies have shown that *Chlamydia trachomatis* is very high among young women precisely blacks but the cause for this situation is yet to be known (Parks, et al, 1997). Many of these infected women are known to have more than one sex partner.

The high regions of the world with high prevalence include Northern Africa, Middle East and Asia. It is also among the commonly reported sexually transmitted diseases in the United States of America (Stamm, 2011). Studies of the natural history of genital *Chlamydia* infections in human are scarce and faced with study design limitations. An improved understanding of *Chlamydia* natural history may influence recommendations for elements of control efforts such as *Chlamydia* screening frequency or time parameters for partner notification. Persistent infection more often progressed to develop clinical signs at the time of treatment. *Chlamydia trachomatis* is the most commonly reported sexually transmitted bacterial infection, with a majority of infected persons being asymptomatic and as a result detection of the infection often relies on screening (Parks, et al, 1997). About 50-70% of *Chlamydia trachomatis* infections are asymptomatic with undetected or multiple infection in up to 70% women population who are at risk of developing a severe reproductive sequelae including pelvic inflammatory disease and tubal infertility (Tukur et al, 2006, Carey and Beagly, 2010). The susceptibility in children is due to mother to child transmission through the birth canal of an infected parent while adults or sexually active age group acquire the bacteria through sexual intercourse with an infected partner (Johnson, et al. 2002).

In view of the insidious nature of infection and paucity of report on this bacterial infection in this part of the country, this research is embarked upon to determine the seroprevalence of *Chlamydia trachoma* is among female students attending Health Services Sickbay of a tertiary institution in Zaria in order to provide base line data for the control programme of the government in the study population.

II. MATERIALS AND METHOD

Study area

The study area was the Health Services Sickbay of a tertiary institution in Zaria attended by staff and students as well as a population living within the academic community. However, the study population was limited to all the female students attending the within a period of six months who gave their consent to be enlisted in the study. Staff and non- students attending the health facility were excluded. Similarly approval for the study was obtained from the Authorities of the Health Centre. A total of 100 female students who reported to the hospital irrespective of their diagnosis were samples for the assay.

Sample collection

Using a 5ml syringe, 2ml of blood sample was collected from the 100 female students aseptically by venepuncture, dispensed into a vacutainer and allowed to clot. The serum was then separated from the whole blood using a micropipette and dispensed into another vacutainer for use.

Assay procedure

All the samples were analyzed for *Chlamydia trachomatis* IgG using the *Chlamydia trachomatis* ELISA kit (Diagnostic Automation and Cortez Inc., U.S.A.). All the specimens and kit reagents were brought to room temperature (20 – 25°C) and 1: 40 dilutions of the test samples, negative and positive controls were prepared in the sample diluents provided. Using a micropipette, 100µl of diluted sera, the calibrator and controls were dispensed into the appropriate wells and 100µl sample diluent was dispensed in well A-1 to serve as blank. The holder was tapped to remove air bubbles from the liquid and mixed well and incubation was done for 30 minutes at room temperature, the liquid was then discarded from all wells and then washing was repeated three times with washing buffer and then blotted. A total of 100µl of enzyme conjugate was dispensed to each well and incubated for 30 minutes at room temperature and after incubation the enzyme conjugate was discarded from all wells and the washing was repeated three times with washing buffer and blotted dry. After blotting, 100µl of TMB chromogenic substrate was dispensed to each well and incubated for 30 minutes at room temperature. This was followed by the addition 100µl of 2N HCl to stop the reaction. The optical density was then read at 450nm with a microwell reader.

III. RESULTS

A total of 92 female students were eventually analyzed as the kit had provision for blank and controls and of this number, 26 representing 28.26% were seropositive. This is presented in Figure I below.

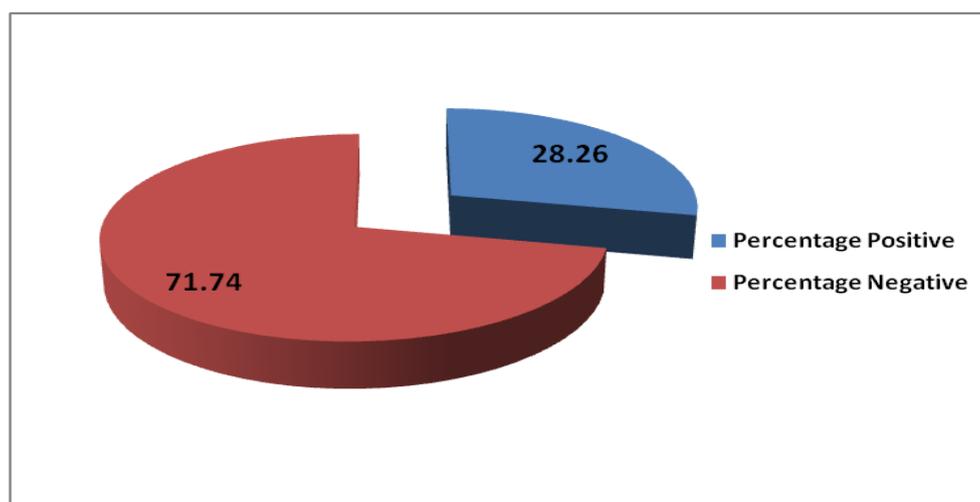


Figure I. Distribution of *Chlamydia trachomatis* IgG among Female students in A B. U. Zaria.

In respect to age distribution, it was found that 78 of the 92 students sampled were in the 18-23 age range where 23 (29.49%) of the 78 female students within the 18 – 23 age range were seropositive while 3(25%) out of the 12 female students in the 24-29 age range were seropositive (table 1). A prevalence of 28.21% (22 cases out of 78) was established for the unmarried female students to *Chlamydia trachomatis* IgG while the married had a prevalence of 28.57 % (4 out of 14 cases) (Table 2).

Table 1: Age Range Distribution of the Assayed Female Student Samples

Age Range	Number of Samples	Number of Positive (%)
18-23	78	23(29.49 %)
24-29	12	3(25 %)
30-35	2	0
Total	96	26 (28.26%)

Table 2: Marital Status of the Assayed Female Student Samples.

Marital Status	Number of Samples	Number of Positive (%)
Married	14	4(28.57 %)
Single	78	22(28.21 %)
Total	92	26 (28.26%)

IV. DISCUSSION

The prevalence of 28.24% in this study was lower than the prevalence of 38.18% (Jatau, *et al* 2009) in an earlier study among pregnant women and 51% in women attending pre and antenatal clinic in the University of Lagos, Nigeria (Mawak, *et al.*, 2011). These works were among pregnant women while this was predominantly among single ladies. Many reports have attributed higher prevalence to the married (Parks, *et al*, 1997). In this study the lower Age range of 18 – 23 had the highest prevalence of 29.49 %. This agrees with Jatau *et al* (2009) which also established that a prevalence of 43.65% among the 21-30 years age group. Women in the higher age bracket were few as the study was conducted among students thus providing a poor contrast between the age brackets. Further studies including significant women in all age brackets would provide a better picture on this finding. However, the degree of promiscuity among the single students and other risk factors such as overcrowding in hostels resulting from increase in university and the attendant poor and limited infrastructure make them prone to this bacterial pathogen. This agrees with the views by Kotchick *et al*, (2001), that *Chlamydia trachomatis* can be transmitted through sexual intercourse and at a lower rate during birth from an infected mother it can be deduced that these female students assayed must have contacted the infection through sex or contact with contaminated surfaces like for example the toilet seats (Kotchick *et al*, 2001). *Chlamydia trachomatis* infections are asymptomatic with undetected or multiple infection in up to 70% women population who are at risk of developing a severe reproductive sequelae including pelvic inflammatory disease and tubal infertility (Carey and Beagly, 2010), showing that the infection is a silent epidemic. In most part of Nigeria, *Chlamydia trachomatis* are not routinely screened for, and hence relative information about frequencies of the organisms is scarce. There is need therefore for routine screening of women for Chlamydia and subsequent treatment to protect them from prolonged infection which could have effect on fertility due to tubal blockage. History of infertility and pelvic inflammatory disease, other sexually transmitted diseases and spontaneous abortion have been associated with the of infection with *Chlamydia trachomatis* (Geisler, 2006) From the result obtained in this study, it can be seen that the prevalence of *Chlamydia trachomatis* was quite high for an enclosed population of enlightened people and due to facts that infections due to *Chlamydia* is highly endemic and asymptomatic, it is therefore recommended that further research should be carried out by health services to screen patients who are suffering from sexually transmitted diseases for Chlamydial infections. The risk factors and the strains of this pathogen can also be researched for.

V. CONCLUSION

The IgG seroprevalence to *Chlamydia trachomatis* among women attending the Health Services Sickbay of the selected tertiary institution in Zaria was found to be 26(28.26%). The seroprevalence showed no significant difference between the married and the single. Similarly, the prevalence did not show significant difference between the faculties of different students.

REFERENCES

- [1] Carey A.J, and Beagly K.W. (2010).Chlamydia trachomatis, a hidden epidemic: effects on female reproduction and options for treatment. *Amreican Journal of Reproductive Medicine* 63:(6),360 - 363
- [2] Geisler WM. (2006) Management of uncomplicated Chlamydia trachomatis infections in adolescents and adults: evidence reviewed for the Center for Disease Control and Prevention sexually transmitted diseases treatment guidelines. *Clin Infect Dis*.3:577 - 581
- [3] Jatau, et al 2009
- [4] Johnson, R.E., Newhall, W.J., Papp, J.P., DeLisle, S. (2002), Screening tests to detect Chlamydia trachomatis and Neisseria gonorrhoea infections. *MMWR Recomm Rep*.18:51(15),1-38
- [5] Kotchick, B.A., Shaffer, A., Forhand, R. and Miller, K.S. (2001). Adolescent sexual risk behaviour:A multi system perspective. *Clinical Psychology Review*.21:(4),493-519.
- [6] Mawak J.D., Dashe N., Agabi Y.A. and Panshak B.W (2011), Prevalence of Genital Chlamydia trachomatis among Gynecologic Clinic attendees in Jos, Nigeria. *Shiraz E-medical Journal. Shiraz Iran*. 12:(2)
- [7] Parks, K.S., Dixon, P.B., Richey, C.M., Garlo, G.G., Alpha,O., Soon, J. and Chaw,S.J. (1997) Spontaneous clearance of Chlamydia trachomatis infection in untreated patients. *Sex Transm Dis*. 24:(4), 229-235
- [8] Ryan, K.J., and Ray, C.G.(editors)(2004), *Sherris Medical Microbiology*(4th ed). McGraw Hill pp.463-70 .
- [9] Stamm W.E (2011), Commonly Reported Sexually Transmitted Diseases in U.S.A. *Int'l Encyclopedia of marriage and family*.20:ac279149, pp1-17.
- [10] Turkur, J., Shitu, S.O. and Abdul, A.M. (2006). A case control study of active genital Chlamydia trachomatis infection among patients with tubal infertility. *Tropical Doctor Royal Society of Medicine Press*.12:ac89026
- [11] Augenbraun M, Bachmann L, Wallace T, et al (1998). Compliance with doxycycline therapy in sexually transmitted diseases clinics.*Sex Transm Dis*.25:1
- [12] Bachmann LH, Stephens J, Richey CM, Hook EW (1999)3rd. Measured versus self-reported compliance with doxycycline therapy for chlamydia-associated syndromes: high therapeutic success rates despite poor compliance .*Sex Trans Dis*. 26:272
- [13] Bedson SP and Bland JOW. (1932). A morphological study of psittacosis virus with the description of a developmental cycle. *British journal of experimental pathology*13, pp 461-466..
- [14] Carey AJ, and Beagly KW. (2010).Chlamydia trachomatis, a hidden epidemic:effects on female reproduction and options for treatment. *Amreican journal of reproductive*.63:(6),360
- [15] Foglia, G., Rhodes, P., Goldberg, M., St Louis, M.E.(1999). Completeness of and duration of time before treatment after screening women for Chlamydia trachomatis infections. *Sex Transm Dis* 26:421 .
- [16] Geisler WM. (2006) Management of uncomplicated Chlamydia trachomatis infections in adolescents and adults: evidence reviewed for the Centers for Disease Control and Prevention sexually transmitted diseases treatment guidelines.*Clin infect Dis*.3:577
- [17] Gordon FB, Harper IA, Quan AL. et al, (1968).Detection of Chlamydia (Bedsonia) in certain infections of man. *J infect Dis* 120:451.
- [18] Hobson,D.,Johnson,F.W.A.,Rees, E. and Tait,I.A.(1974). Simplified method for diagnosis of genital and ocular infections with Chlamydia .*Lancet* ii,pp555-556.
- [19] Joanne MW, Linder MS, Christopher JW (2008). Prescott, Harly and Kliens *Microbiology* (7th edn) McGraw Hill Int'l NewYork. pp 531-532.
- [20] Johnson, R.E., Newhall, W.J., Papp, J.P.,DeLisle, S. (2002). Screening tests to detect Chlamydia trachomatis and Neisseria gonorrhoea infections. *MMWR Recomm Rep*.18:51(15),1-38
- [21] Kalwij, Sebastine; Macintosh, Marry; Baraitser paula. (2010). screening and treatment of Chlamydia trachomatis infections. *Journal of America Sexually Trasmitted disease association*.37:(2).pp 63-67
- [22] Mawak JD, Dashe N, Agabi YA, Panshak BW, (2011), Prevalence of Genital Chlamydia trachomatis among Gynecologic Clinic attendees in Jos, Nigeria. *Shiraz E-medical journal. Shiraz Iran*. 12:(2)
- [23] Mohammed, Tafida A, Christian E (2009), Causes of blindness and visual impairment in Nigeria.*Investigative ophthalmogy and visual science, an ARVO Journal*. 5:(9),4114-4120
- [24] Nichols, R.L.(1971). Trachoma and related disorders caused by Chlamydia agents .*Cong.series no.23*
- [25] Parks, K.S.,Dixon, P.B., Richey, C.M., Garlo,G.G.,Alpha,O.,Soon,J.,and Chaw,S.J.(1997) Spontaneous clearance of Chlamydia trachomatis infection in untreated patients. *Sex Transm Dis*. 24:(4), pp229-235
- [26] Robinson E, Kur LW, Ndaba A, Lado M, Shafi J, McClelland RS, Kolaczinski JH. (2010). Trachoma rapid assessments in unity and northern Bahr-el-Ghazal States, Southern Sudan.*Anthony.R Feeks veterinary laboratories agency United Kingdom*.5(10), pp1-7
- [27] Ryan, K.J., and Ray, C.G.(editors)(2004), *Sherris Medical microbiology*(4th ed). McGraw Hill pp.463-70 .
- [28] Stamm, W.E(1999),Chlamydia trachomatis infection: progress and problem.*J.infect Dis*.179:5380-383
- [29] Stamm W.E (2011), Commonly Reported Sexually Transmitted Diseases in U.S.A. *Int'l Encyclopedia of marriage and family*.20:ac279149, pp1-17.
- [30] Turkur, J., Shitu, S.O. and Abdul, A.M. (2006). A case control study of active genital Chlamydia trachomatis infection among patients with tubal infertility.*Tropical Doctor Royal Society of Medicine Press*.12:ac89026.
- [31] Kotchick, B.A., Shaffer,A., Forhand,R., and Miller, K.S.(2001). Adolescent sexual risk behaviour:A multi system perspective. *clinical psychology review*.21:(4),493-519.