SEROPREVALANCE OF CHLAMYDIA TRACHOMATIS ANTIBODIES IN FEMALES OF REPRODUCTIVE AGE VISITING HOLY FAMILY HOSPITAL, RAWALPINDI

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ABSTRACT

Objective: To determine the Chlamydia trachomatis IgG antibodies in females of reproductive age visiting Holy Family Hospital, Rawalpindi

Study Design: Comparative cross-sectional Study.

Place and Duration of Study: Microbiology department, Holy Family Hospital (HFH), Rawalpindi Medical College, Rawalpindi from Apr 2014 to Oct 2014.

Methodology: A total of 328 females of reproductive age with 164 each in both fertile and infertile group, visiting Holy Family Hospital were included in the study. After taking written consent, detailed history was taken and recorded on bio data proforma. Blood sample was taken in Gynaecology outpatient department and then transported to Microbiology Department, Holy Family Hospital. IgG antibodies were detected by Enzyme-linked immunosorbent assay (ELISA). The data was recorded & analyzed by SPSS version 20.

Results: Out of 328 females, 37 (11.28%) were positive for Chlamydia trachomatis IgG antibodies. Out of this, 8.5% were fertile females and 14% were infertile.

Conclusion: This study showed the high frequency of Chlamydia trachomatis IgG antibodies in females of Rawalpindi.

Keywords: Chlamydia trachomatis, ELISA, IgG antibodies.

INTRODUCTION

Chlamydia trachomatis is the most common bacterial sexually transmitted infection globally. An estimated 130 million new cases of Chlamydia trachomatis are diagnosed annually[1]. Chlamydia trachomatis is an obligate gram negative intracellular bacterium. It has 18 serotypes and urogenital infection is caused by D-K serovars[2].

Genital chlamydial infection can cause cervicitis and salpingitis in females. It may remain as a silent infection. Chronic infection may lead to pelvic inflammatory disease, tubal damage and ultimately result in tubal factor infertility. Sequelae like ectopic pregnancies, abortions and still births are also associated with chlamydial infection. In males, chlamydial infection can lead to epididymitis and urethritis[3].

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Chlamydial urogenital infection remains a major burden on public health care system. Asymptomatic nature of the disease as well as its persistence in the genital tract and horizontal spread renders this infection a major health burden especially in developing countries[4].

The infection can be effectively treated with antibiotics if detected earlier without any complications. Early diagnosis is extremely important in resource poor countries. Prevalence of chlamydial infection in Pakistan is unknown because of lack of surveillance programs. Serological assays can therefore be developed as a potential epidemiological tool to assess the prevalence of chlamydial infection in sexually active adults to facilitate the public health care facilities for screening and management of this clinically silent infection. The relatively small number of studies in the general population on Chlamydia trachomatis prevalence, highlight the need for additional studies in order to better understand the true burden of this

sexually transmitted infection on the population and guide screening programs and interventions to improve sexual and reproductive health.

METHODOLOGY

This comparative cross-sectional study was carried out at the Microbiology department Holy Family Hospital, Rawalpindi Medical College, Rawalpindi from April 2014 to October 2014. It was non-probability consecutive sampling.

The sample size was calculated by the following formula keeping the power of study equal to 80% and anticipated precision is 6%.

$$n = \frac{z^2_{\left(1-\frac{\alpha}{2}\right)} [p_1 \ (1-p_1\ ) + p_2 \ (1-p_2\ )}{(p_1\ - p_2\ )^2 \ / \ or \ d^2}$$

(Sample Size determination in health studies version 2.0.21 WHO)

Sample size was 328 females of reproductive age which is defined as women aged 15-49 years.

Females of the reproductive age visiting Gynaecology OPD were included and all those who were not willing to give blood sample were excluded. After approval by hospital ethical committee and informed consent, demographic data and reproductive history was obtained. Venous blood sample (3mL) was taken and allowed to clot at room temperature. The samples were transported to Microbiology (Pathology) Department, HFH, Rawalpindi and were centrifuged in batches of 8, at 3000 rpm for 5 minutes to separate serum and then preserved at -20°C till further proceedings for Enzyme-linked immunosorbent assay (ELISA) in labelled plastic bullet tubes. ELISA kit was used to detect Chlamydia trachomatis specific IgG antibody. After 1:100 dilution, samples were incubated in microtiter wells precoated with Chlamydia trachomatis antigen. Horseradish peroxidase (HRP) labeled anti-human IgG conjugate is added after washing and it binds to captured Chlamydia specific antibodies. after adding Tetramethylbenzidine (TMB) substrate, the immune complex formed gives a blue colored reaction product. Then a stop solution is added and the absorbance of the end product was read at 450 nm using an ELISA plate reader[5].

The results were declared positive, negative or borderline based on cut off values and were expressed in Novatec units (NTU). The data was recorded and analyzed by SPSS version 20. Descriptive statistics were used to calculate frequencies and percentage. Specimen correlation used to find the relation between age and presence of IgG antibodies. Spearman correlation was used to find the relation between age and presence of IgG antibodies.

RESULTS

Among 328 patients studied, the mean age was 30.45 ± 50476 range from 20 to 44 years as shown in table-I. Below 25 years were only 19.20% females. A small number of women were above 40 years i.e. 4.57%.

11.28% of females were positive for Chlamydia trachomatis IgG antibodies. In borderline positive category 6.09% females were tested. Almost 82% of the females were negative for this test (table-II).

Majority of the females who were tested positive were in the age bracket of 25-30 years. Whereas there was no female above 40 years who was tested positive. To test for the correlation between age and presence of IgG antibodies Pearson Correlation was applied. The correlation coefficient came out to be 0.157 with a *p*-value of 0.38. So it showed a weak correlation between age and presence of IgG antibodies to Chlamydia trachomatis. A *p*-value>0.05 showed non significant difference between age and IgG antibodies to Chlamydia trachomatis.The mean ± standard deviation of age was 30.45 ± 5.476 years.

DISCUSSION

The burden of this sexually transmitted infection in Pakistan is hardly known. Limited studies have been conducted in our country to assess its seroprevalence. In Faisalabad a study was conducted from 2006-2009 showing prevalence of Chlamydia trachomatis to be 4.7%[6]. The prevalence of Chlamydia trachomatis in females

of reproductive age was seen to be 4% in a study conducted in Abbottabad[7].

The higher prevalence rate of Ig G antibodies against Chlamydia trachomatis in females of reproductive age highlights the importance of screening of this infection. As it is usually a silent infection, people do not seek early medical care and long-term complications can ensue. Furthermore, these silent infections can act as reservoir of the disease and can be a source of spread. Chlamydia trachomatis infection can easily avoid host immune response thus leading to serious side effects[8].

Table-I: Distribution of study population according to age group.

Age interval	Females	
	Frequency	Percentage
Below 25 Years	63	19.20
25-30 Years	127	38.71
31-35 Years	64	19.51
36-40 Years	59	17.98
Above 40 Years	15	4.60

Table-II: Distribution of Chlamydia trachomatis IgG antibody in females.

IgG Values in Interval	Females	
	Frequency	Percentage
Below 9 NTU (Negative)	271	82.62
9 NTU-11 NTU (Borderline)	20	6.09
Above 11 NTU (Positive)	37	11.29

Table-III: Age interval vs. IgG Values Cross-tabulation.

Age interval	Below 9 (Negative)		9-11 (Borderline)		Above 11 (Positive)	
	n	%	n	%	n	%
>25 Years	55	20.30	3	15.00	5	13.50
25-30 Years	95	35.10	6	30.00	26	70.30
31-35 Years	56	20.70	5	25.00	3	8.10
36-40 Years	52	19.20	4	20.00	3	8.10
>40 Years	13	4.80	2	10.00	-	-

Sexually transmitted infections are still a major stigma in society and people shy away from seeking medical advice and treatment of this treatable infection[9]. Many factors including cultural, social and religious dilemmas contribute towards this stigmatization. Illiteracy, lower socioeconomic status and male dominance in our society also play a role in seeking appropriate medical care regarding sexually transmitted diseases.

Long term persistence in female genital tract can ultimately lead to different complications including infertility as well. Screening of population can help in detecting such cases earlier and prevent development of complications. Awareness at masses level and incorporating screening of such diseases in our health policy can help inalleviating this issue.

PCR and cell cultures are considered as gold standard tests for chlamydial infection but are resource intensive. Serological diagnosis can be used as an alternate test for detecting prevalence of chlamydia in a population subset in developing countries. Antibodies detected against Chlamydia trachomatis suggest a past or chronic infection by the pathogen[10].

The prevalence of Chlamydia trachomatis infection in Brazil was found to be 19.6%[11] and this could be due to higher number of females seeking medical advice for sexually transmitted diseases (STD). The sensitivity and specificity of this diagnostic test is 75% and 80.95% respectively[12]. In India, chlamydial prevalence was 28%[13]. Studies have shown an association between presence of Chlamydia trachomatis antibodies and tubal blockade and tubal factor infertility[14]. In this way, serology of Chlamydia trachomatis is a useful indicator in infertile females and can also be used as potential biomarker of scarring sequel like pelvic inflammatory disease[15].

The serological assays of Chlamydia trachomatis along with its natural history of infection in the high risk population are essential for the development of vaccine. Infection prevention strategies like vaccines are important to limit the spread of this disease[16].

We should have proper data on seroprevalence of this disease and this could determine the burden on health system and thus we can implement proper strategies to diagnose this STD.

Women at risk for chlamydial infection should be tested and treated and this could ultimately interrupt the course of disease[17]. The recommended treatment for chlamydial infection is 1 gram azithromycin or doxycycline (100mg) BD for 1 week[18-20].

RECOMMENDATIONS

This study showed the importance of detecting Chlamydia trachomatis IgG antibodies in females and we can limit the complications by early detection in females of reproductive age group as this infection is a major burden on health system. A national policy should be implemented for serological testing for Chlamydia trachomatis in sexually active females. Early diagnosis and treatment should be an essential component of women health program in resource poor countries and it will be very useful for the society. There should be public awareness about this sexually transmitted disease and it should be through different campaigns, mass media and pamphlets. Proper training of health professionals can also help to deliver the right message in a right manner.

CONCLUSION

This study showed the high frequency of Chlamydia trachomatis IgG antibodies in females of Rawalpindi.

CONFLICT OF INTEREST

This study has no conflict of interest to be declared by any author.

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