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Original Article

Profile of patients having pelvic inflammatory disease and prevalence of *Chlamydia trachomatis* infection in the symptomatic women attending Gynecology unit in a tertiary center

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ABSTRACT

Introduction: *Chlamydia trachomatis* is one of the causes of sexually transmitted bacterial disease (STD's) causing genital infection in the world. Many countries have expanded the strategies to investigate, diagnose and manage this curable, but prevalent and indolent disease. Most severe consequence in women is pelvic inflammatory disease (PID) and infertility. This study was designed to detect *Chlamydia trachomatis* infection and to correlate the infection with various risk factors in the symptomatic females attending the gynecology OPD at Dhiraj Hospital, Piparia, Vadodara, Gujarat, India

Methodology: From September 2016 to November 2016, 50 consecutive symptomatic women of reproductive age were screened for the presence of *Chlamydia* antigen. Endocervical swabs were collected and tested using Immunochromatographic immunoassay.

Results: The limited number of cases of infertility and PID investigated did not reveal any positive case of Chlamydia antigen from endocervical swabs.

Conclusion: Accurate diagnostic tests like NAAT and ELISA are required instead of point-of-care test to prove its role in PID and infertility.

Keywords: *Chlamydia trachomatis*, Endocervical swabs, Immunochromatograhic test , Pelvic Inflammatory Disease (PID)

INTRODUCTION

According to CDC (Center for Disease Control and Prevention, Atlanta) *Chlamydia trachomatis* is one of the most commonly detected sexually transmitted bacterial pathogen.[1] In women, *Chlamydial* infections (80% being asymptomatic), are of epidemiological and clinical significance.[2] However, the infection may sometimes lead to mucopurulent cervicitis, urethritis, salpingitis, endometritis and ectopic pregnancy.[2] Ascending intraluminal spread of organism causing mucopurulent cervicitis from cervix may produce pelvic inflammatory disease (PID). During pregnancy, it may result in chorioamnionitis, premature membrane rupture, premature

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delivery and also an increased risk of cervical carcinoma.[2] They are also associated with 3 to 4fold increased risk of HIV transmission.[2,3] From 1987 to 2003, incidence of *Chlamydia* infections in women has increased noticeably from 79 to 467 per 100,000. World Health Organization (WHO) has reported that about 101 million new *Chlamydia* infections are detected worldwide every year.[4] As *Chlamydia* infections are commonly asymptomatic or cause mild or nonspecific symptoms and signs as well as the rate of *Chlamydia* infections around the world have been hiking over the last decade. Hence, routine screening of women at high risk of *chlamydial* infection is advisable in any health care set up.[5] Usually the genital *C. trachomatis* infection is diagnosed by specific tests like NAAT, ELISA etc.[6] Therefore, a point-of-care test is needed to detect *C. trachomatis* infection[6] early and prevent severe sequel. Also infected patient, unaware of its infection, may serve as a reservoir of infections to their partners. Therefore there is a need to screen women for *Chlamydia* infection so that the treatment strategies can be planned and reduce the menace of the disease.

METHODOLOGY

Subjects: 50 consecutive women of reproductive age, who attended the Obstetrics and Gynecology Outpatients Department of our tertiary care centre, were included in this prospective cross-sectional study. The study was initiated only after approval of Institutional Ethics Committee. Study period was of three months from September 2016 to November 2016. A standard questionnaire including age, chief complaints (if leucorrhoea , duration, amount, odour, itching), associated complaints (abdomen pain, urinary complain, dysparunea, etc), educational status, socioeconomic background, occupation, menstrual history, marital status ,obstetric history, sexual activity, contraceptive history, previous history of any STD and medicines taken was asked to every patient. The study was explained to each patient in detail and a written consent was obtained from them.

Specimen (Endocervical swabs) **collection (Done by the gynecologist):** Bivalve speculum was used to visualize cervix while examining the patient in lithotomy position. To begin with, excess mucus was removed using first swab provided in the kit moistened with sterile physiological saline. Then, the second swab was inserted approximately 1 cm in to the cervical canal and rotated for 15-20 seconds before withdrawing. The swab was removed taking care that it does not touch the vaginal surface and was placed in the sample collection tube. The specimens were immediately used for testing.

Material: "**SD BIOLINE *Chlamydia*"** test kit (manufactured by Standard Diagnostics, Republic of Korea) was used, which is a solid phase Immunochromatographic assay to detect *Chlamydia antigen* qualitatively, rapidly and directly from the endocervical swab.

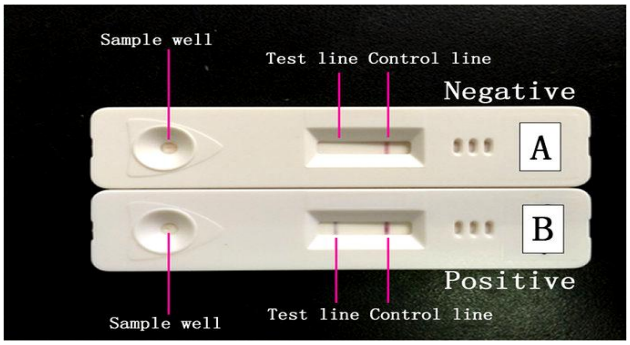

Figure 1: Immunochromagraphic test for *Chlamydia tracomatis*

Principle: SD Bioline *Chlamydia* encloses a membrane strip, coated on test kit band region with mouse monoclonal anti-*Chlamydia tracomatis*. A visible line is formed by the complex of *Chlamydia* antigen and mouse monoclonal anti-*Chlamydia tracomatis*-colloid gold conjugate as it moves along the membrane chromatographically towards the test region. This line indicates a positive result in just 15

minutes (Figure 1). SD *Chlamydia* kit has the sensitivity of 93% and specificity is 99% when the results were compared with the cell culture.

Table 1: Demographic details of the recruited subject

Characteristics		No. (%)
Age	15-30 yrs	25(50%)
	30-45 yrs	25(50%)
Religion	Hindu	45(90%)
	Muslim	05(10%)
Educational status	Primary	37(74%)
	Secondary	10(20%)
	Higher secondary	01(2%)
	Post-Graduate	02(4%)
Socioeconomic status	Low income	36(72%)
	Middle income	12(24%)
	High income	02(4%)
Menstrual cycle	Regular	29(58%)
	Irregular	21(42%)
Marital status	Married	48(96%)
	Unmarried	02(4%)
Previous history of STD	Yes	0
	No	50(100%)

Table 2: Symptom profile of the subjects

Sr. No.	Symptoms	No. of females (%)
1	White foul smelling discharge with Redness, itching and burning in genital area	28(56%)
2	White discharge with abdominal pain and dysmenorrheal	09(18%)
3	White discharge with swelling of vulva	05(10%)
4	Dysparuenia	04(8%)
5	Dysuria	04(8%)

Table 3: Clinical profile of the subjects (n=50)

Sr. No.	Disease	No. of the females (%)
1.	Pelvic Inflammatory disease	38(76%)
2	Recurrent abortion	7(14%)
3	Infertility	3(6%)
4	Cervicitis	1(2%)
5	Ectopic pregnancy	1(2%)

n=no of samples, NAAT: nucleic acid amplification test, ELISA: enzyme linked immunosorbant assay, ICT: immunochromatographic test

RESULTS

Table 1 summarizes the demographic characteristics of the participants. Most of the females were middle aged, hindus, educated only till primary level and of low socio economic class. Table 2 summarizes the symptom profile of all 50 participants where majority of the females came with the complain of White discharge with Redness, itching and burning in genital area (56%), followed by discharge with dysmenorrhea (18%). clinically 76% of the women were diagnosed with pelvic inflammatory disease, 14% cases recurrent abortion and 6% cases with infertility (Table 3).

We tried to correlate all this risk factors with the presence of *Chlamydia* infection, but we could not find a single positive case for *Chlamydia* in the subjects recruited for this study.

DISCUSSION

The real incidence of *Chlamydia* infection in developing countries is difficult to establish due to several factors like socio cultural shyness, unavailability of facility to detect the organism in many health clinics and asymptomatic nature of the disease.[7,8] Despite these limitations, high prevalence of *Chlamydia* infection has been reported in India. Reliable laboratory methods

available presently for detecting Chlamydia include cell culture, NAAT and ELISA.[9] However, it has been found that there is a wide variation in the cost, sensitivities and specificities of these methods.[9] As a result of the different methods used for *Chlamydia* detection and different characteristics of the study population there is a wide variation in prevalence rates of *Chlamydia* infection.[9] Several authors from different states in our country have reported wide variation in the prevalence which ranges from 0.8%-30% (Table 4).

Table 4 Prevalence of Chlamydia tracomatis, India

Area	Age group (yrs)	Study population	n	Sample	Test	Prevalence	ref
Gujarat (vadodara)	18-45	Gynecological OPD	200	Endocervical swabs	ICT	12%	10
Mumbai	18-42	Gynecological OPD	123	Cervical swab	ELISA	1.7%	11
Tamilnadu	15-45	Population based	841	urine	NAAT	1.1%	12
Delhi	18-45	Gynecological OPD	143	Cervical swab	NAAT	28.5%	13
Karnataka	18-59	Community	450	urine	NAAT	0.88%	14
Chennai	18-45	STD clinic	143	Blood, genital swab	NAAT & cell culture	30.8%	15
Vellore	19-45 yrs	Gynecological OPD	99	Endocervical swabs	ICT	0.1%	16

n=no of samples, NAAT: nucleic acid amplification test, ELISA: enzyme linked immunosorbant assay, ICT: immunochromatographic test

The incidence of *Chlamydia* infection in the present setting was found to be 0%. There could be several explanations for this observation; one could be the low sample size (n=50) to prove any relation, secondly the diagnostic methods used in different set up are usually of high sensitivity and specificity- NAAT and ELISA (Table 4), which is not feasible to perform as a short term student research, thirdly the performance evaluation of Point-of-Care test is low compare to NAAT, may lead to false negative results. Author like Vidvan *etal* [17] have reported that NAAT is superior to the RDT (rapid diagnostic test) in diagnosing *Chlamydia* in a low prevalence setting. The rapid tests offer an advantage over conventional laboratory tests only in a high prevalence setting and when results are required immediately for patient management. Benefits to the patients include diagnosis and treatment at the same visit, thus eliminating the problem of repeat visits and loss to follow up.

CONCLUSION

Accurate diagnostic tests like NAAT and ELISA are required instead of point-of-care test to prove the role of *chlamydia trachomatis* in PID and infertility. Furthermore, screening of *Chlamydia* should be incorporated as a part of routine antenatal screening tests to prevent adverse pregnancy and neonatal outcomes.

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REFERENCES

1. Global prevalence and incidence of selected curable sexually transmitted diseases: Overview and estimates. Geneva: World Health Organization; 2011.
2. Malhotra M, Sood S, Mukherjee A, Muralidhar S, Bala M. Genital Chlamydia trachomatis: an update. Indian Journal of Medical Research. 2013 Sep 1;138(3):303-16.
3. Weinstock H, Berman S, Cates W. Sexually transmitted diseases among American youth: incidence and prevalence estimates, 2000. Perspectives on sexual and reproductive health. 2004 Jan 1;36(1):6-10.
4. Centers for Disease Control and Prevention. Sexually Transmitted Disease Surveillance 2003 Supplement, Chlamydia Prevalence Monitoring Project. Atlanta, GA: US Department of Health and Human Services, Centers for Disease Control and Prevention. 2004 Oct.
5. Handsfield HH, Jasman LL, Roberts PL, Hanson VW, Kothenbeutel RL, Stamm WE. Criteria for selective screening for *Chlamydia trachomatis* infection in women attending family planning clinics. Jama. 1986 Apr 4;255(13):1730-4.
6. Malenie R, Joshi PJ, Mathur MD. Chlamydia trachomatis antigen detection in pregnancy and its verification by antibody blocking assay. Indian journal of medical microbiology. 2006 Apr 1;24(2):97-100.
7. Okonofua FE, Ako-Nai KA, Dighitoghi MD. Lower genital tract infections in infertile Nigerian women compared with controls. Genitourinary medicine. 1995 Jun 1;71(3):163-8.
8. Harry TC, Saravanamuttu KM, Rashid S, Shrestha TL. Audit evaluating the value of routine screening of Chlamydia trachomatis urethral infections in men. Int J STD AIDS. 1994 Sep-Oct;5(5):374–375
9. Verkooyen RP, Peeters MF, van Rijsoort-Vos JH, Van der Meijden WI, Mouton JW. Sensitivity and specificity of three new commercially available Chlamydia trachomatis tests. International journal of STD & AIDS. 2002 Dec;13(1_suppl):23-5.
10. Neelam Pandya, Nishidh Pandya, Govind L Ninama, Jivraj R Damor. Detection of *Chlamydia* Trachomatis Antigen Directly From Endocervical Specimen. national journal of medical research. July – Sept 2011;1(1):13-5
11. Mania-Pramanik J, Meherji P, Gokral J, Donde U. Chlamydia trachomatis infection in an urban setting. Sexually transmitted infections. 2001 Apr;77(2):141.
12. Joyee AG, Thyagarajan SP, Rajendran P, Hari R, Balakrishnan P, Jeyaseelan L, Kurien T, STD Study Group. Chlamydia trachomatis genital infection in apparently healthy adult population of Tamil Nadu, India: a population-based study. International journal of STD & AIDS. 2004 Jan 1;15(1):51-5.
13. Singh V, Salhan S, Das BC, Mittal A. Predominance of Chlamydia trachomatis serovars associated with urogenital infections in females in New Delhi, India. Journal of clinical microbiology. 2003 Jun 1;41(6):2700-2.
14. Sowmya B, Rajendran P, Krishnan S, Joyee AG, Hari R, Rajesh PK. Prevalence of Chlamydia trachomatis and Neisseria gonorrhoeae genital infections in the apprently healthy population of Sringeri (Karnataka) by a coamplification PCR assay. Indian journal of medical microbiology. 2001 Oct 1;19(4):228-9.
15. George JA, Panchatcharam TS, Paramasivam R, Balasubramanian S, Chakrapani V, Murugan G. Evaluation of diagnostic efficacy of PCR methods for Chlamydia trachomatis infection in genital and urine specimens of symptomatic men and women in India.

Japanese journal of infectious diseases. 2003
16. Yohen Nandeibam, Shakti Laishram, Jessie Lione. Prevalence of *Chlamydia trachomatis* in a tertiary center in South India. Journal of Medical Society 2016;30:31-34.
17. Nandeibam Y, Laishram S, Lionel J. Prevalence of Chlamydia trachomatis in a tertiary center in South India. Journal of Medical Society. 2016 Jan 1;30(1):31.

Jun 1;56(3):88-92.
18. Vidwan NK, Regi A, Steinhoff M, Huppert JS, Staat MA, Dodd C, Nongrum R, Anandan S, Verghese V. Low prevalence of Chlamydia trachomatis infection in non-urban pregnant women in Vellore, S. India. PloS one. 2012 May 2;7(5):e34794.