

Prevalence of chlamydia trachomatis and its association with other STIs

Shinde Sapana N^{1*}, Anjali Swami², Sujata Baveja³

Department of Microbiology, Lokmanya Tilak Municipal Medical College and General Hospital, Sion, Mumbai, Maharashtra, INDIA.

Email: drshindesapana83@gmail.com

Abstract

Background: *Chlamydia trachomatis* is the most common bacterial sexually transmitted infections worldwide. Studies from India have reported varying prevalence rate of *C. trachomatis*. They also increase susceptibility of HIV, gonococcal and syphilis infection. **Aim:** To study the prevalence of Chlamydia and its association with other STIs in patients attending outdoor department at a tertiary care hospital. **Material and Methods:** The present cross sectional study enrolled 100 clinically suspected cases of having STI attending the STD outpatient clinic of a tertiary care hospital. Genital discharge specimens (endocervical, vaginal, and urethral swabs) were collected from all the patients. The patients were investigated for the presence of antigen *C. trachomatis* with the help of immunochromatographic detection. Investigations of other STIs were carried out using the standard methods. **Results:** Prevalence of Chlamydia infection was found to be 2%. Out of 23 total positive STI cases 5 cases were of co-infection. Syphilis was most common infection associated with other STIs. One male was having gonorrhoea and syphilis co-infection. Two men were having Chlamydia infection along with Syphilis. HIV and Syphilis co-infection was present in 2 males. **Conclusion:** In present study, low prevalence of 2% of Chlamydia infection was found. Further studies with involvement of large population, symptomatic and asymptomatic will help to determine more accurate prevalence of Chlamydia infection.

Key Words: Chlamydia trachomatis, sexually transmitted infections, prevalence, co-infection, syphilis.

*Address for Correspondence:

Dr. Shinde Sapana N, Department of Microbiology, Lokmanya Tilak Municipal Medical College and General Hospital, Sion, Mumbai, Maharashtra, INDIA.

Email: drshindesapana83@gmail.com

Received Date: 12/06/2018 Revised Date: 21/07/2018 Accepted Date: 19/08/2018

DOI: <https://doi.org/10.26611/1008723>

Access this article online

Quick Response Code:



Website:

www.medpulse.in

Accessed Date:
22 August 2018

INTRODUCTION

Chlamydia trachomatis is the most common bacterial sexually transmitted infections worldwide.¹ Studies from India have revealed the prevalence of *C. trachomatis* in young females to be 43%, in the gynecology outpatient department (OPD) and 18.9% in the Sexually Transmitted Disease (STD) patients.^{2,3} Genital chlamydial infection is usually asymptomatic leading to various complications due to primary infection and promotes the host susceptibility to other sexually transmitted infections.⁴ *C.*

trachomatis and *N. gonorrhoeae* are two most common bacterial infections of lower genital tract. With gonococcal infection there is 15-40% higher risk of acquiring *Chlamydia*.⁵ They also increase susceptibility and infectiousness of HIV infection.⁶ Co-infection of Chlamydia with other STIs highlights the importance of early laboratory diagnosis and specific treatment. The present study was conducted to study the prevalence of Chlamydia and its association with other STIs in patients attending outdoor department at a tertiary care hospital.

MATERIAL AND METHODS

The present cross sectional study enrolled 100 clinically suspected cases of having STI attending the STD outpatient clinic of a tertiary care hospital.

Inclusion Criteria

- Subjects of age more than 18 years.
- Patients attending STD clinic with complaints of vaginal/ urethral discharge, abdominal pain, dysuria etc.
- Patients with consent.

Exclusion Criteria

- ANC patients
- Age group less than 18 years
- Patients without consent

The study commenced after institutional Ethics Committee and MUHS approval. Patients complaining of abnormal vaginal discharge or urethral discharge were selected. Vaginal discharge can be present normally but it is considered abnormal when it is heavier, thicker than normal, it is pus like, white and clumpy (like cottage cheese), when it is having smell like foul or fishy and accompanied by itching, burning micturition, a rash or soreness and abdominal pain. Under STI/RTI programme, patients from STD clinic were tested by VDRL test for syphilis, and also for HIV in different sections in our institute with their consent. We noted results of these tests with their consent. Urethral, vaginal and endocervical swabs were collected using sterile cotton swabs with standard procedure from all the patients. Four endocervical or urethral swabs were collected for one patient. They were immediately transported to laboratory stored in Stuart medium. In laboratory one swab was used for staining i.e. Gram staining and Giemsa staining. Second swab was used for culture on Blood agar and Thayer Martin medium for Gonococci. Rest two sample were used for immunochromatographic detection of Chlamydia and Gonococci. SD BIOLINE Chlamydia Rapid Test (Standard Diagnostic Inc., Korea) and In STI check™ Gonorrhea, were used for the qualitative detection of *C. trachomatis* and *Neisseria gonorrhoeae* respectively.

Statistical Analysis: Sample size was calculated using SAS 9.2 package. Data were analysed using SPSS V 15.0 (Statistical Package for Social Sciences Version 15.0) package. Data were given as Mean and SD for quantitative data and Number (Percentage) for qualitative data. Percentages between 2 groups were compared by Fisher's exact test for small numbers and Chi square test for large numbers. All statistical tests were two tailed. Level of Significance was taken as $P < 0.05$.

RESULTS

All patients were >18 years old. The youngest cases were two males and 2 females of 19 years old and the case with the maximum age was 49 years old. Majority of the cases i.e. 49 were in the age group of 26 to 35 years (49%). Mean age for all subjects was 28.25 years. Out of total number of 100 patients, 85 were females and 15 were male. Maximum number of positive cases i.e. 12 were in the age group of 26-35 years followed by 9 cases in the age group of less than 25 years and 2 cases in 36-45 years age group. But there was no significant association between age group and positivity. In males, out of total

15 patients 12 were positive i.e. 80% and out of 85 females, 11 i.e. 12% were positive. Thus, male had statistically significant higher positive value.

Table 1: Age-wise Distribution of All Diagnosed STI Cases

Age group (years)	Positive subjects (n = 23)	Negative subjects (n = 77)	Total subjects (n=100)
≤ 25	9 (39.1%)	21 (24.7%)	30
26-35	12 (52.2%)	37 (48.1%)	49
36-45	2 (8.7%)	16 (18.8%)	18
>45	0 (0.0%)	3 (3.9%)	3
Total	23 (100.0%)	77 (100.0%)	100

Out of 23 total positive cases, 18 were positive for single infection. On studying distribution of positive STI cases of single infection it was observed that out of 15 males, 4 were syphilis positive, 3 were HIV positive and among 85 females, 5 were syphilis positive, 4 HIV positive and 2 cases of bacterial vaginosis (BV) reported.

Table 2: Gender-wise and Disease-wise Distribution of All STI Cases

Disease	Gender	Positive (n=18)
Syphilis	Male (15)	4 (26.67%)
	Female (85)	5 (5.89%)
HIV	Male (15)	3 (20%)
	Female (85)	4 (4.7%)
BV	Male (15)	NA
	Female (85)	2 (2.35%)

Prevalence of Chlamydia infection was found to be 2% (95% Confidence Interval) by using rapid antigen detection test. Out of 100 patients only 2 patients were positive for Chlamydia by using rapid antigen detection. Giemsa smear was negative for inclusion bodies. Both patients with Chlamydia infection were positive for syphilis.

Table 3: Association of Chlamydia with other STI

Disease	Category	Chlamydia		Total
		Present	Absent	
Syphilis	Present	2 (0.0)	9 (100.0)	11
	Absent	0	89 (97.8)	89
	Total	2	98	100
Gonorrhea	Present	0	1	1
	Absent	2	97	99
	Total	2	98	100
HIV	Present	0	7	7
	Absent	2	91	93
	Total	2	98	100
BV	Present	0	2	2
	Absent	2	96	98
	Total	2	98	100

Out of 23 total positive STI cases 5 cases were of co-infection. Syphilis was most common infection associated with other STIs. One male was having gonorrhoea and syphilis co-infection. Two men were having Chlamydia infection along with Syphilis. HIV and Syphilis coinfection was present in 2 males.

Table 4: Co-infections found in all subjects according to gender

Co-infection	Gender	No. of positives
Gonorrhea + Syphilis	Male (15)	1 (6.67%)
	Female (85)	0
Chlamydia + Syphilis	Male (15)	2 (13.33%)
	Female (85)	0
HIV + Syphilis	Male (15)	2 (13.33%)
	Female (85)	0

DISCUSSION

Chlamydia is global epidemic.¹ Among bacterial STIs, *C. trachomatis* and *N. gonorrhea* are two most common organism causing genital infections.⁷ The signs and symptoms of these two are indistinguishable.⁵ Most infected patients remain asymptomatic and often go unnoticed, even if symptomatic, symptoms are nonspecific. In undiagnosed and untreated cases, it can result in irreversible sequelae like pelvic inflammatory disease, infertility, salpingitis etc. Infected patient can also serve as reservoir in transmitting infection to their partner.⁸ With gonococcal infection there is 15-40% higher risk of acquiring Chlamydia.⁵ Patients infected by both organisms tend to shed larger number of *C. trachomatis*. It has been observed that post gonococcal urethritis is often caused by *C. trachomatis* which is not cured by conventional therapy against gonorrhea. Thus, co-infection has been reported. Also genital Chlamydial infection makes patient vulnerable for other STI and coinfection is common with many other STI.⁵ Prevalence of chlamydia is being determined all over the world but there is great variation according to age of patient, geographic area, and the institution where the patient reports.⁹ In our study, prevalence of Chlamydia infection was 2% by using rapid antigen detection test. Out of 100 patients, only 2 patients were positive for Chlamydia by using rapid antigen detection. Giemsa smear was negative for inclusion bodies. Similarly, in a study by Basava *et al* in 2015, 8.89% of cases were positive by antigen detection method, but they did not find inclusion bodies on Giemsa smear.⁴ Our results were similar to many studies e.g. in a study by Arora *et al* in 2014 at Haryana found very low prevalence of Chlamydia infection. Out of 7950 urban population 4 were positive for Chlamydia and out of 4672 rural population 1 was positive for Chlamydia.¹⁰ Ramia *et al* couldn't find a single case of Chlamydia.¹¹ Desai *et al* in 2003 reported it as 8.5%.¹² Prevalence was reported as 8.13% by Savitha *et al* in 2009,¹³ and 8% by Nayyar *et al* in 2015.¹⁴ These results are in concordance with our study. Malhotra *et al* and Patel L *et al* also reported high prevalence of 19.9% and 23% respectively.^{5,15} In these studies, motivation given to patients to attend STD might have resulted in higher detection rates. Low positivity in our study could be due to irrational antibiotic use for nonspecific genital

infections given by general practitioner. Being a tertiary care centre, many patients come here after taking first course of medicine. The geographical differences also affect prevalence. On studying association of Chlamydia with other STI, in our study, co-infection was observed with syphilis. Both Chlamydia positive cases were syphilis positive. Co-infection of Chlamydia with syphilis was 5% in study by Basava *et al* in 2015.⁴ Malhotra *et al* in her study observed that co-infection of syphilis in two cases out of 55 Chlamydia positive cases.⁵ These results are in consistent with our study. We did not get coinfection with any other STI but there are reports of Chlamydia coinfection with many other STI like gonococci, Bacterial vaginosis, HIV etc.¹⁶

CONCLUSION

In present study, low prevalence of 2% of Chlamydia infection was found in patients attending STD OPD at a tertiary care hospital. Further studies with involvement of large population, symptomatic and asymptomatic will help to determine more accurate prevalence of Chlamydia infection, associated risk factors. It will also help in studying role of screening of patients with rapid antigen detection kits.

REFERENCES

1. Newman L, Rowley J, Vander Hoorn S, Wijesooriya NS, Unemo M, Low N, et al. Global Estimates of the Prevalence and Incidence of Four Curable Sexually Transmitted Infections in 2012 Based on Systematic Review and Global Reporting. PLoS ONE 2015; 10(12):e0143304.
2. Singh V, Rastogi S, Garg S, Kapur S, Kumar A, Salhan S, et al. Polymerase Chain reaction for the detection of endocervical Chlamydia trachomatis infection in women attending a Gynaecology Outpatient Department in India: The International Academy of Cytology. ActaCytol 2002; 46:540-4.
3. Joyee AG, Thyagarajan SP, Sowmya B, Venkatesan C, Ganapathy M. Need for specific and routine strategy for the diagnosis of genital chlamydial infection among patients with sexually transmitted diseases in India. Indian J Med Res 2003;118:152-7.
4. Basava SPR, Sappa RT, Reddy PS, Kandati J, Buchinenei M, Pathapati RM. Genital Chlamydial Infection Association with HIV and Syphilis in Female Patients Attending STD-Clinic in a Tertiary Care Hospital. Int J Current Microbiol Applied Sciences 2015; 4(8): 422-429.
5. Malhotra M, Sood S, Mukherjee A, Muralidhar S, Bala M. Genital Chlamydia trachomatis: an update. Indian J Med Res 2013; 138(3): 303-16.
6. Cohen MS, Hoffman IF, Royce RA, et al. Reduction of concentration of HIV-1 in semen after treatment of urethritis: implications for prevention of sexual transmission of HIV-1. Lancet. 1997; 349:1868-73.

7. National guidelines on prevention, management and control of reproductive tract infections including sexually transmitted infections. Ministry of Health and Family Welfare, Government of India, August 2007. Guidelines on PMC of RTI Including STI.
8. Rukadikar AR, Raut SS, Tankhiwale SS, Munne KR, Joshi SG. Sero-Prevalence of Chlamydia Trachomatis in STI Patients. *Journal of Evolution of Medical and Dental Sciences* 2014; 3(7):1605-11.
9. Awwad ZM, Arwa A, ALAmarat, Asem A, Shehabi. Prevalence of genital chlamydial infection in symptomatic and asymptomatic Jordanian patients. *Indian Journal of Infectious Diseases* 2003; 7(3): 206-209.
10. Arora BB, Maheshwari M, Devgan N, Arora DR. Prevalence of Trichomoniasis, Vaginal Candidiasis, Genital Herpes, Chlamydiasis, and Actinomycosis among Urban and Rural Women of Haryana, India. *Journal of Sexually Transmitted Diseases* 2014; 963812.
11. Ramia S, Kobeissi L, F el Kak, Shamra S, KreidiehK. Reproductive tract infections (RTIs) among married non-pregnant women living in a low-income suburb of Beirut, Lebanon. *Journal of Infection in Developing Countries*. 2012; 6(9): 680–683.
12. Desai VK, Kosambiya JK, Thakor HG, Umrigar DD, Khandwala BR et al Prevalence of sexually transmitted infections and performance of STI syndromes against aetiological diagnosis, in female sex workers of red light area in Surat, India. *Sex Transm Infect* 2003; 79(2): 111-5.
13. Savitha S, Madhavan S, Raja VR. Incidence of Chlamydial infection in women. *J Pharm Sci Res* 2009; 1(1): 26-33.
14. Nayyar C, Chander R, Gupta P, Sherwal BL. Evaluation of risk factors in patients attending STI clinic in a tertiary care hospital in North India. *Indian J Sex Transm Dis* 2015; 36(1):48-52.
15. Patel AL, Sachdev D, Nagpal P, Chaudhry U, Sonkar SC, Mendiratta SL, et al. Prevalence of Chlamydia infection among women visiting a gynaecology outpatient department: evaluation of an in-house PCR assay for detection of Chlamydia trachomatis. *Ann ClinMicrobiolAntimicrob* 2010; 9: 1–10.
16. Bautista CT, Wurapa E, Sateren WB, Morris S, Hollingsworth B et al. Bacterial vaginosis: a synthesis of the literature on etiology, prevalence, risk factors, and relationship with chlamydia and gonorrhea infections. *Mil Med Res* 2016; 13; 3-4.

Source of Support: None Declared
Conflict of Interest: None Declared