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Prevalence of *Chlamydia trachomatis* infection in women in Chennai, India

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Abstract

The study objective was to evaluate the prevalence of *Chlamydia trachomatis* infection in women with and without infertile conditions. A total of 280 patients, aged 18-40, recruited for the study, were referred by infertility clinics in the Chennai city. Gynecological examinations confirmed genital discharges (group I) in 184 patients and irregular periods (group II) in 96 women. The comparative group (control) consisting of 55 women, aged of 20 – 38 years, who had no clinical symptoms or specific syndromes of Chlamydia infections. Anti chlamydial IgG antibodies in the serum were determined using an immune enzymatic assay. In the direct test, *C. trachomatis* infection was found in group I in 112/184 (60.9%), in group II in 72/96 (75%) and in the comparative group in 5/55 (9.1%). Our results show a higher prevalence of *C. trachomatis* infection in female patients with specific symptoms as compared to unaffected women, thus suggesting that diagnostic tests for *C. trachomatis* infection should be included in the screening programmes for women.

Key Words: *Chlamydia trachomatis*, genital discharges, anti chlamydial trachomatis antibodies

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Introduction

Chlamydia trachomatis according to CDC (Center for Disease Control and Prevention, Atlanta) is one of the most frequently detected sexually transmitted bacterial pathogen [1]. Chlamydial infection in women have major epidemiological and clinical significance and are usually asymptomatic upto 80% [2,3]. The most common clinical manifestation of *C. trachomatis* infection ion women is cervicitis, being associated with the affinity of the chlamydial pathogen for epithelial cells [3]. The major ailment of this infection is mucopurulent cervicitis and characterized by congestion of the vaginal part of the uterine cervix, which bleeds easily, and by

the presence of mucopurulent secretion from the cervical canal [4]. The majority of chlamydial infection in women are asymptomatic, but may give rise upto pelvic inflammatory disease (PID) and tubal infertility. Screening programmes aim at reducing morbidity in individuals by early detection and treatment, and at decreasing to overall prevalence of infection on the population [5,6,7]. A number of modeling studies have tried to calculate the threshold prevalence of Chlamydia lower genital tract infection and screening becomes cost effective [8]. There is considerable debate over the exact complication rates after chlamydial infection and are more precise estimated of PID and tubal infertility are required for case in point in economic models [5].

This study had the following objectives,

i. To describe a sample of sexually active women, aged ranges of 18 – 40, observed in infertility cases in health clinics in Chennai city.
ii. To assess the prevalence of *C. trachomatis* infection related with infertility in that samples.
iii. To identify possible risk markers associated with the infection.
iv. To determine the seroprevalence of chlamydial IgG antibodies in infertile women attending in infertility clinics.

Materials and Methods

A methodical sample of 280 women patients aged 18 – 40 observed in infertility clinics was studied between August 2006 to December 2009. All the patients came with a previously established gynecological diagnosis to undergo testing for *C. trachomatis* infection. insertion criteria were i) age ≤ 30 years ii) sexually active iii) observation of the clinical syndromes iv) conversant acquiesce given by the patients.

The patients with serological tests were performed in 184 cases from group I (Gynecological examinations confirmed genital discharges) and in 96 patients from group II (irregular periods). The comparative group consisting of 55 women aged of 20 -38 years, who had no clinical symptoms or specific syndromes of chlamydial infection.

In this study, blood sample was collected and serum was included to understand the presence of IgG specific ELISA. Additionally, we evaluated the incidence of *C. trachomatis* infection according to the patient's age and analyzed data concerning contraceptive methods used by each patient.

Results and Discussion

Among the subjects included in this study, the infertility women presenting with complaints was interpreted in Figure 1. In group I (gyneocologically examination confirmed genital discharges) *C. trachomatis* infection was detected by IgG specific ELISA in 93/184 (50.5%), in group II (irregular periods) in 62/96 (64.6%). In the comparative group, *C. trachomatis* was found in 5/55 (8.7%). The comparative analysis among group I, group II and control were shown in Figure 2.

Figure 1: Infertile women presenting with complaints

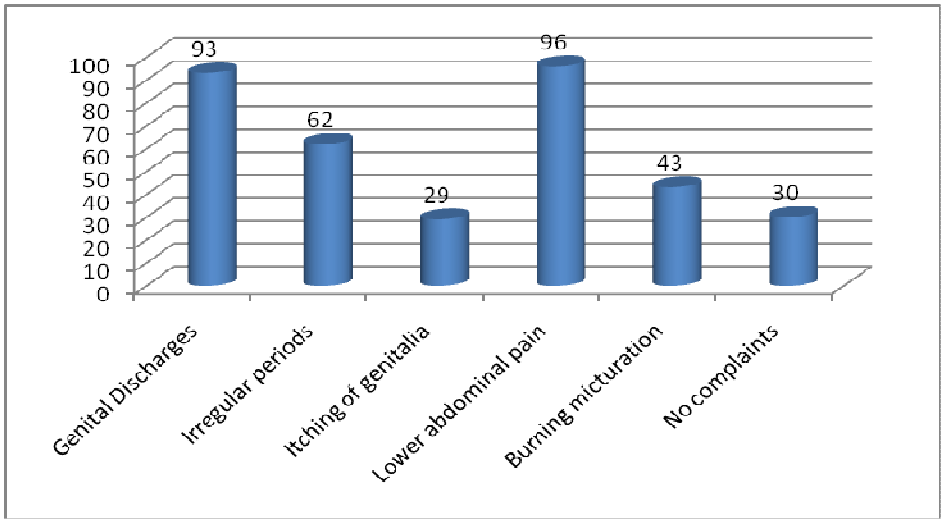
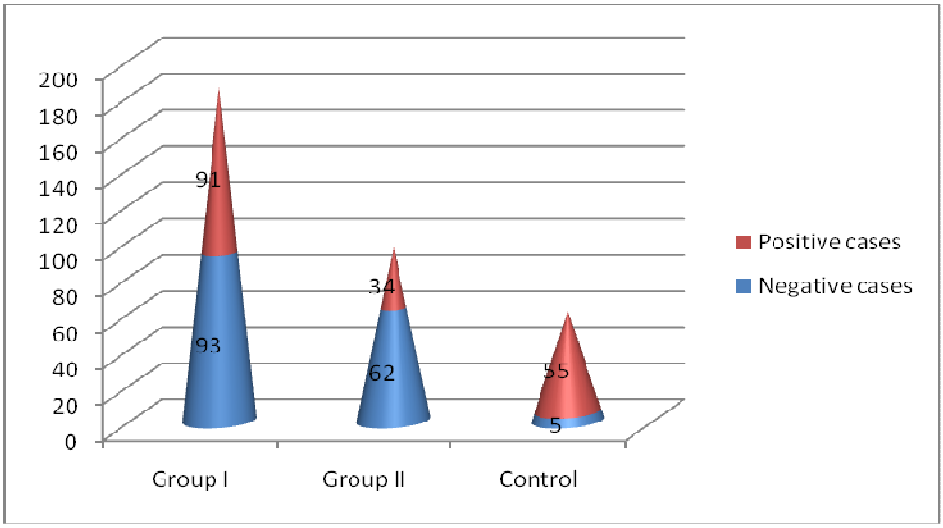


Figure 2: The result of serological studies in women with pathological changes of Chlamydial infections and in comparative group [Group I – Genital discharges; Group II – Irregular periods; control]



The percentage of Chlamydia positive patients was the highest in the age group of 26-30 (34.6) and 31-35 (27.8) in group I and group II respectively, while the lowest in the age group of 18-20. The various age distribution and its serological positivity in infertile women was well studied. The infection rate was observed more in the women those who are get marriage in between 1-5 years and less was observed in 11-15 years. Majority of the infertile women belonged to the salary group of 25,000 and above. The presence of Chlamydia antibodies is higher in the same group. The *C. trachomatis* positivity in infertile women and their age distribution was depicted in the Table 1.

Table 1: *C. trachomatis* positivity in infertile women and their age distribution

Age groups	No. of cases	No. of positive cases to *C. trachomatis*	
		Group I	Group II
18 – 20	9 (3.2)	1 (11.1)	-
21 – 25	58 (20.7)	22 (37.9)	14 (24.1)
26 – 30	97 (34.6)	34 (35.0)	22 (22.7)
31 – 35	78 (27.8)	23 (29.5)	30 (38.5)
36 – 39	36 (12.8)	11 (30.5)	7 (19.4)
> 40 yrs	2 (0.71)	-	-

Figures in parentheses indicate percentage

The role of *C. trachomatis* infection in cervical lesions has been the spotlight of several researchers. Literature data show elevated frequency rates of chlamydial infection in women with genital discharges with cervicitis alone (20-40%) [9] and with cervicitis accompanied by erosion (50- 80%) [10,11]. Using either the direct or serological tests, no such differences was found in between group I and group II. Though, in our study a higher percentage of patients with cervical lesions were *C. trachomatis*-positive, as compared to the control. In the direct test, *C. trachomatis* was detected in 12.2% of the patients in group I, in 20% in group II and in 2.9% in the comparative group.

Similar results were reported by Qian, who found *C. trachomatis* infection in 13.4% of women with cervical erosion, the rate being substantially higher than in lesions-free patients [12]. We found statistically significant differences between group II and the comparative group in the direct tests for *C. trachomatis*, but not between group I and the control. In the literature, *C. trachomatis* IgG antibodies in patients with symptoms of cervicitis were detected in 30-40% of patients [13,14], which is unswerving with our findings. The slightly lower rate of positive results in our study as compared to earlier reports of other authors might be due to differences in the superiority of diagnostic methods, which are currently more explicit.

Recent scientific reports have indicated a possible role of *C. trachomatis* infection in the development of neoplasia as well as cervical carcinoma. Some authors reported a high percentage of chlamydia-positive patients with previously detected HPV infection (47.7-65.7%) [15,16]. Anttila et al. point at the role of *C. trachomatis* infection as an independent factor in the development of dysplasia and cervical carcinoma [17]. *C. trachomatis* infections are most commonly detected in women under 25 years of age [18,19]. We found as many as 39.5% of chlamydia-positive patients in the age group of 17-25.

A literature survey suggests that the use of hormonal contraceptive methods increases the risk of *C. trachomatis* infection [20,21]. Hormonal contraception promotes sexual activity and frequent changes of sexual partners, thus leading to cervical ectopy. In our study, among the *C. trachomatis*-positive patients only 23.7% used oral contraceptive pills, as most of them were

married or had one sexual partner. As revealed by demographic analysis, the majority of women with chlamydial infection originates from towns and has higher education. This is probably associated with better availability of diagnostic procedures and easier access to information concerning sexually transmitted infections in larger towns.

Age at first intercourse has been found by others to be associated with genital infection by *C. trachomatis*. An inverse trend related age and prevalence of infection was in found in fact in this study, but statistically no such significance was associated due to small sample size. Using condoms sometimes/ never and the presence of an altered cervix through positively associated with the infection, fail to provide an acceptable positive predictive value for infection. Thus, a clinical approach is not adequate for our population, leaving the prevalence as the sole epidemiological indicator for a decision for or against any kind of formal screening.

Contact tracing and treatment remain a major problem in our study; asking the women with a positive result for *C. trachomatis* to obtain a blood sample from their partners for testing elicited a response from less than one third of the women. A high prevalence of infection (almost40%) was found among partners, reinforcing the notion that active efforts to identify sexual partners of infected women are essential to reduce both reinfection rates and new infections.

The descriptive conslusionary remarks of this study are *C. trachomatis* infection is more common in women with pathological cervical lesions as compared to those without. Our results show the necessity to include screening for chlamydial infection in the prophylactic schemes for women. No statistically significant differences were found in the prevalence of *C. trachomatis* infection between women having and not having cervical erosions. The results presented here, which represent preliminary findings from a larger study in progress; suggest that the rate of *Chlamydia trachomatis* infection in female users of infertility clinics in Chennai is comparable to that found in similar settings in other places.

Immunoglobulin G antibody detection is an effective and non invasive tool for the detection of Chlamydia and a more viable option than other techniques in India. Screening of women with secondary infertility for *C. trachomatis* is strongly recommended to allow early therapeutic interventions. In screening programmes, chlamydia antibody testing, as an intermediate marker for potential adverse sequelae, might enable more precise estimates. This study also shows a wide spread Chlamydia infection which suggest higher sexual activity. Since sexual activity is also linked to HIV transmission, further exploration of Chlamydia as a marker for sexual activity and consequent HIV transmission needs to be carried out.

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