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ORIGINAL ARTICLE

SEROPREVALENCE OF PRIMARY INFERTILITY AND ACUTE PELVIC INFLAMMATORY DISEASE CAUSED BY CHLAMYDIA IN AJMER REGION

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ABSTRACT

Purpose: *Chlamydia trachomatis* is emerging as important pathogen of pelvic inflammatory disease and acute salpingitis. These infections are major cause of financial losses and serious medical complications as infertility.
Methods: In the present study, the diagnosis of chlamydial genital infections was made by detection of antichlamydial IgM antibodies by E.L.I.S.A among a group of 50 females each with acute pelvic inflammatory disease and primary infertility along with 50 healthy control females.
Results: The present study shows, high seroprevalence (45.33%) of *C trachomatis* infections. Strong correlation of these chlamydial infections with age factor and socioeconomic status was observed. These chlamydial infections presents in both clinical and sub-clinical form and also lack pathognomic sign & symptoms.
Conclusion: This study emphasizes the need of strong clinical suspicion along with screening of such subjects with a laboratory test which can provide rapid and specific diagnosis, thereby preventing complications.

Keywords: Chlamydial seropositivity, primary infertility, acute pelvic inflammatory disease

INTRODUCTION

Chlamydia trachomatis is exclusively a human pathogen and its infections have got increasing trend[1]. The clinical spectrum of sexually transmitted *C trachomatis* infection parallels that of gonococcal infection however *C trachomatis* infections produce fewer sign and symptoms [2]. *C trachomatis* has emerged as an important causative agent of pelvic inflammatory disease (PID) in females and its sequel includes ectopic pregnancy and tubal obstruction secondary to salpingitis leading to infertility[3].

Acute salpingitis is the most serious complication of chlamydial genital infections[3] and during last few years *C trachomatis* has been cited as important and progressively increasing cause of salpingits[1]. The infection most often spread to the fallopian tubes canalicularly through the genital tract[4]. Its significance lies in the fact that it is a direct cause of infertility. Females accounts for about one-third of cases of infertility with tubal factor being responsible in 30 to 50 percent cases i.e. obstruction of fallopian tubes is the most common cause of sterility in females[5] with tubal occlusion being most common sequel after pelvic infections[1]. Infertility rates ranges from 12.8% after one episode to 75% after three or four episodes of chlamydial infections[6]. Tubal occlusions hence

infertility is more common after non-gonorrheal than after gonorrheal salpingitis[7]. This may be attributed to high rate of asymptomatic infections, a persistent carrier state, reactivation of latency and difficulty in eradicating chlamydial infection[8].

A strong positive correlation has been found to exist between seropositivity for antichlamydial antibodies and infertility due to tubal blockade[8,9]. Infertile women with tubal disease are two to four times more likely to have elevated antibodies to *C trachomatis* than either infertile women with normal tubes or pregnant women[10] which is of diagnostic value.

Diagnosis of chlamydial infections can be made by both cultural and serological methods. Cultural methods are cumbersome. In contrast, serological methods as ELISA are specific, cost effective and can provide rapid diagnosis thereby helping in prompt institution of specific therapy and consequently preventing developments of complications as infertility.

MATERIAL AND METHODS

The study population consisted of 50 females of reproductive age group with acute PID and 50 females with primary infertility that presented at the outpatient Department of Obstetrics and Gynecology of Jawaharlal Nehru Medical College, Ajmer. The clinical diagnosis of acute PID was made, based on the criteria defined by Felmon et al[11]. 50 age-matched healthy females with no clinical evidence of genital tract infection or trachoma were taken as control in this study.

5 ml of venous blood was drawn from all the females included in the study for the laboratory measurement of the serum IgM specific antibodies against *C .trachomatis* by ELISA (Novum Diagnostics, Assar – Gabrielsson – Str. 1A, Germany). The kits manual was strictly followed while conducting the tests. Initial screening of all the sera was done for syphilis by Venereal Disease Research Laboratory Test (VDRL—Immutrep, Rapid Plasma Reagin Card Test) and Human Immunodeficiency Virus (HIV) antibody by Dot Immunoassay (Combaids-RS). The whole study group was found to be non-reactive for syphilis and H.I.V, thereby ruling out simultaneous presence of these infections with chlamydial genital infection.

OBSERVATION AND DISCUSSION

An overall seropositivity of 45.33% for antichlamydial IgM by ELISA among the study group was observed. The seroprevalence of chlamydial infection among acute PID and primary infertility subjects (54%) was found to be roughly double than that in the control group (28%).

Among the control group, results in concordance with the present study, were also obtained by Ray, et al[12] with IgM positivity rate of 27.7%. In studies of Joshi, et al[13] 15% females were positive for Chlamydia with 81% of them being asymptomatic; this high seropositivity may be due to the fact that their study group comprised only of cases positive for *C trachomatis*. These observations suggest that there is a significant prevalence of sub-clinical chlamydial infections in asymptomatic form in general population. These studies also hint towards the importance of a screening test, which can provide early and specific diagnosis, thereby helping in preventing long-term sequel as infertility etc. in asymptomatic population.

Table 1: Age wise distribution among various study parameters and chlamydial serology

Age Groups (in years)	Acute PID		Primary Infertility		Healthy Control	
	Subjects (50)	IgM +ve (24)	Subjects (50)	IgM +ve (30)	Subjects (50)	IgM +ve (14)
15-20	10	4	14	8	12	4
21-25	20	12	18	12	22	8
26-30	8	4	10	6	8	2
31-35	6	2	4	2	4	--
36-40	6	2	4	2	4	--
41-45	--	--	--	--	--	--

Antichlamydial IgM positivity observed in acute PID and primary infertility cases was 48 % and 60% respectively. Results comparable to those of present study were also obtained in studies

conducted by Bhujwala et al[14]with seropositivity in acute PID and primary infertility cases of 63% and 60% respectively. Likewise in studies conducted by Treharne, et al[15], 73% women having salpingitis were positive for antichlamydial IgM. This slightly higher prevalence may be due to the fact that the study was carried out exclusively among highly selective group of females with clinically proven salpingitis.In contrast, Sweet, et al[16] was unable to isolate *C trachomatis* from the exudates of inflamed tubes, while isolation rate was 5% from cervical samples in the same subjects. These studies suggest that the IgM seropositivity in present study parallels to those of other Asian countries but is much higher than that of western countries.

In the present study, all the females belonged to age-group spread over the span of 15 to 45 years (table 1). Highest incidence of chlamydial genital infections was observed in third decade with slight preponderance in its first half i.e. peak seropositivity was noticed in 21-25 years age group i.e. 60% for acute PID, 66.66% for primary infertility and 36.36% for healthy controls. The seropositivity was found to decrease in later decades of life. These observations indicate that chlamydial genital infection, are most prevalent in adolescents and young adults i.e. sexually active age group. Results supporting this were also obtained by Nagasawa, et al[10]; Ohwada, et al[17]with highest incidence of chlamydial infections in twenties. Similarly, in studies conducted by Sessa, et al[5]; Bontis et al[6]; Douveir, et al[7] high prevalence of antigen and IgM seropositivity (both markers of active infection) was seen in 15–30 years age group. Thus, the present study further affirms previous observations that there is higher IgM seropositivity among earlier decades of sexual life.

Table 2: Correlation between chlamydial seropositivity among different Socio-Economic (SE) class

Study Parameter	Upper SE Class		Middle SE Class		Lower SE Class	
	Subjects	IgM +ve	Subjects	IgM +ve	Subjects	IgM +ve
Acute PID	8	2	12	4	30	18
Primary Infertility	6	2	14	6	30	22
Healthy Control	8	2	24	4	18	8

The chlamydial seropositivity was found to be highest among the lower socioeconomic class (table 2) and rural population (table 3). These findings may be attributed to inability to seek proper diagnosis and treatment for venereal diseases due to social stigmata's attached to them besides illiteracy especially lack of sex education. Increase incidences of broken homes, sexual disharmony, and prostitution among lower socioeconomic class may be additional contributory factors.

The subjects with acute PID and primary infertility presented with multiple signs and symptoms (figure 1).

Table 3: Chlamydial seropositivity among rural and urban population

Study Parameter	Rural		Urban	
	Subjects	IgM +ve	Subjects	IgM +ve
Acute PID	36	20	14	4
Primary Infertility	28	18	22	10
Healthy Control	22	4	28	10

The most common symptom seen was of menstrual irregularities while highest seropositivity was observed among subjects complaining of pelvic pain. Slight preponderance of pelvic pain and backache was seen in acute PID cases, while that of menstrual irregularities was observed in cases with primary infertility but no statistical correlation could be generated. Similar results with higher seropositivity were also obtained in studies carried by Treharne et al[16]. Among various signs mucopurulent pus at cervical os showed highest seropositivity (50%). Similar results were also obtained in studies carried out by Brunham, et al[18]. Dyspareunia, fever, itching vulva, vaginits, cervicitis, per vaginal discharge, bad B.O.H. etc

constituted other signs and symptoms among the subjects but no statistical correlation could be derived among above them indicating that no single sign or symptoms of *C trachomatis* genital infections is pathognomic and clinical diagnosis of acute PID and primary infertility per see implies a comparatively low degree of accuracy.

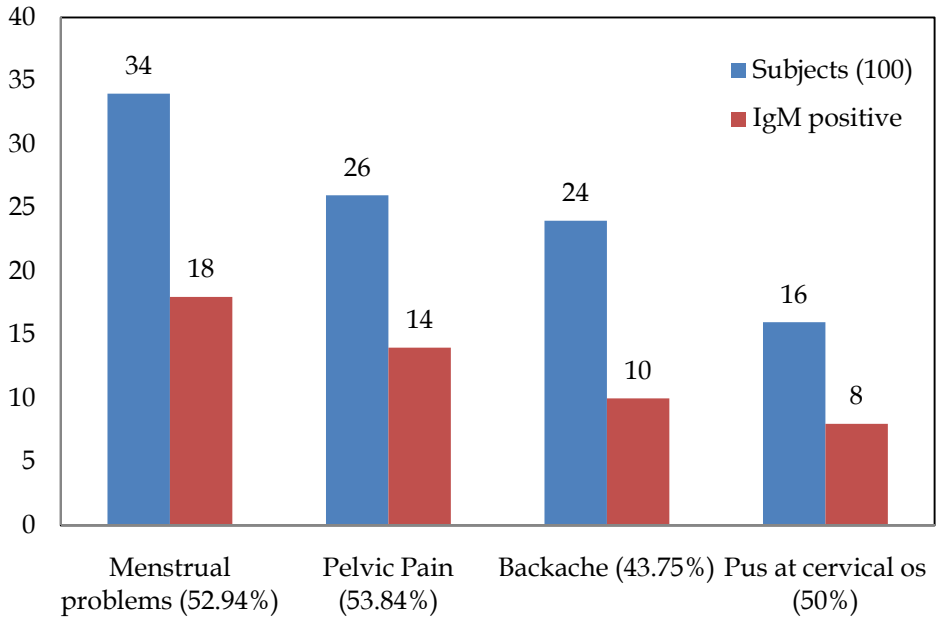

Fig 1: Relationship of chlamydial serology with symptoms and signs

SUMMARY AND CONCLUSION

High seroprevalence with peak incidence in third decade of *C trachomatis* infection in clinical and sub-clinical form was observed in the present study highlighting its increasing role in causing genital infections. It was also perceived that the symptoms and signs of chlamydial infections are not pathognomic. Both these findings strongly suggest the need of high degree of clinical suspicion and a screening test which can provide rapid and specific diagnosis thereby preventing not only long-term sequel as infertility among asymptomatic population but also allowing early institution of appropriate therapy.

Culture though considered gold standard for diagnosis is not proficient for rapid diagnosis. At present, antibody detection by ELISA is very cost effective and practical method for rapid and specific diagnosis of chlamydial genital infections, though further studies are required to further affirm its diagnostic utility.

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