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PREVALENCE OF CHLAMYDIA TRACHOMATIS INFECTION IN INDIAN INFERTILE WOMEN – A PROSPECTIVE STUDY

Obstetrics & Gynaecology

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ABSTRACT

BACKGROUND: Infertility affects 9% of couples of whom 70% suffer from primary infertility and 30% secondary infertility.Upto two third of cases of tubal factor infertility may be attributable to C. trachomatis infection. The present study was done to study the prevalence of serum IgG Chlamydial antibodies in infertile patients

METHODOLOGY: A prospective analytical study was done on 70 infertile women in the Department of Obstetrics and Gynaecology,SRN Hospital,Prayagraj, UP, India over a period of one year (October 2018 - September 2019).

RESULTS: Prevalence of serum chlamydia in the studied population was 15.71%.Majority of cases were between 21-29 years, 41.43% patients belonged to lower socio economic status, 60% were from rural habitat and 54.55% were illiterate.

CONCLUSION: It was concluded from the study that Chlamydia trachomatis serology is a non-invasive and cost-effective test for screening tubal factor infertility.

KEYWORDS

Infertility, Tubal Infertility, *Chlamydia trachomatis*, Chlamydia IgG Antibody test

INTRODUCTION

Worldwide, more than 70 million couples suffer from infertility the majority being residents of the developing countries. [7] It has been estimated that infertility affects 9% of couples of whom 70% suffer from primary infertility and 30% secondary infertility.Tubal factor infertility accounts for 30% of cases of female infertility.Partial or complete bilateral tubal obstruction results from previous salpingitis.Most commonly this is post abortal, puerperal, gonococcal, Chlamydial or tuberculosis in nature.[15]

The current focus on TFI has been on the immunopathology of tubal chlamydial infections, for which differences in host factors, such as genetic polymorphism in cytokine response and human leukocyte antigen type,may play a role in the outcome of pelvic inflammatory disease. Sub-clinical salpingitis is today regarded as even more common than symptomatic PID. Persistent tubal infections by C. trachomatis is also a common feature,even despite courses of antibiotic therapy. Therefore,there is often a time lag between the acute primary pelvic inflammatory disease (PID) and when women first consult because of fertility problems.The use of new species-specific antibody tests for C. trachomatis has decreased previous specificity problems found when used to detect tubal occlusion in work-up of infertile women.[11]

Infertility rate after a single episode of PID correlates with the degree of residue of tubal damage. Tubal infertility also increases with recurrent episodes of PID. Infertility occurred in 8% of patients with one episode, 20% with two episodes and 40% in those with three or more episodes of PID. Further, upto two third of cases of tubal factor infertility may be attributable to C. trachomatis infection. C. trachomatis by itself produces a mild form of salpingitis with an insidious onset.Chlamydia can remain in the fallopian tubes for months or years after initial colonization of the upper genital tract. [8]

The importance of Chlamydia was documented during 1980s when treatment of acute PID during new antibiotic research trials was initially believed to be successfully accomplished with regimens not active against Chlamydia trachomatis. However, although success was evident at short term follow up, long term follow up demonstrated that treatment of Chlamydia trachomatis was necessary.Therefore the current treatment of PID includes Chlamydia trachomatis coverage, even though this organism may not be the cause of acute symptoms.The present study was done to study the prevalence of serum IgG Chlamydial antibodies in infertile patients with or without tubal pathology.

METHODOLOGY

A prospective analytical study was done in the Department of Obstetrics and Gynaecology, SRN Hospital, Prayagraj, UP, India over a period of one year (October 2018 - September 2019).

Inclusion criteria:

- Married women ≥18 years of age with complain of infertility.

Exclusion criteria :

- Patient not giving consent.
- Patients with active pelvic infection.
- Patients with male factor infertility.
- Patients with positive TB GOLD test.

A detailed history of duration of married life, menstrual cycle, contraceptive use and its duration, history of discharge per vaginum, history of any medication, occupation , husband occupation etc was taken and thorough general and systemic examination was done.

Laboratory investigation blood group and Rh typing , haemoglobin, total and differential leukocyte count, haematocrit, blood sugar (both fasting and post – prandial), HbsAg , VDRL, HIV 1 & 2, Mantoux test, urine routine and microscopy, TB-GOLD, hysterosalpingography, ultrasonography and husband's semen analysis were done.Special investigation serum Chlamydia IgG Antibody titre was done.(**INTERPRETATION-Negative**: IgG Index of 0.8 or less are seronegative for IgG antibody.**Equivocal**: IgG Index of 0.80 – 1.1 are equivocal.**Positive**: IgG Index of 1.1 or greater.)

The data was collected and statistical analysis was done using unpaired t test (for comparing mean), Chi square test (for categorical data) or Fischer exact test for small numbers when appropriate.For statistical analysis $P<0.05$ was considered as significant.

RESULTS

The present study was done on 70 infertile women who underwent blood sample examination for serum Chlamydia IgG antibody test by ELISA method. The patients included in the study divided into two groups:

GROUP A: infertile women with S.Chlamydia IgG antibody test positive.

GROUP B: infertile women with S.Chlamydia IgG antibody test negative.

Table 1: Case Distribution

Group	S.Chlamydia IgG antibody test	No. of case	%
Group A	Positive	11	15.71%
Group B	Negative	59	84.29%

Out of 70 patients, 11(15.71%) has serum chlamydia antibody test positive and 59 (84.29%)patients had serum chlamydia IgG antibody test negative. None of the patients had equivocal result.

Table 2: Age Distribution

Age Group (In Years)	Group A: S.Chlamydia IgG +ve (n=11)		Group B: S.Chlamydia IgG –ve (n=59)	
	No.	%	No.	%
20-24	2	18.18	11	18.64
25-29	6	54.54	19	32.20
30-34	2	18.18	16	27.12
>35	1	9.09	13	22.03
Mean ± SD	27.45±4.03		29.79±5.62	

In group A out of 11 infertile women maximum number of patients belonged to the age group of 25-29 years(n=6, 54.54%).Similarly, in group B maximum women were in the age group of 25-29 years(n=19, 32.20%).The mean age of patients in group A was 27.45±4.03 and in group B was 29.79±5.62.The P value was not significant (0.1927).

Table 3: Age Of Onset Of Sexual Activity

Age Group (In Years)	Group A: S.Chlamydia IgG +ve (n=11)		Group B: S.Chlamydia IgG –ve (n=59)	
	No.	%	No.	%
< 20	2	18.18	5	8.47
20-24	8	72.73	31	52.54
25-29	1	9.09	19	32.20
≥30	0	0	4	6.78
MEAN±SD	21.81±1.88		24.05±3.48	

In group A, 90 % of the patients had an early onset of sexual life before 24 years of age and mean age of onset was 21.81±1.88 years. In group B, 61.01% patients had onset of sexual life before 24 years of age and mean age was 24.05±3.48.

Table 4 : Duration Of Married Life

Duration of Married Life (in years)	Group A: S.Chlamydia IgG +ve (n=11)		Group B: S.Chlamydia IgG –ve (n=59)	
	No.	%	No.	%
<5	3	27.27	27	45.76
5-10 yrs	6	54.54	25	42.37
>10 yrs	2	18.18	7	11.86
Mean±SD	6.09±3.04		6.31±3.71	

In group A maximum number of patients (54.54%)had duration of married life for 5-10 years while in group B, 45.76% patients had married life of <5yrs.The mean duration of married life in study group was 6.09±3.04 and in control group was 6.31±3.71 years. The P value equals 0.8537 was not statistically significant.

Table 5: Duration Of Infertility

Duration of Infertility (In Months)	Group A: S.Chlamydia IgG +ve (n=11)		Group B: S.Chlamydia IgG –ve (n=59)	
	No.	%	No.	%
12-24	2	18.18	8	13.56
24-36	1	9.09	15	25.42
36-48	3	27.27	13	22.03
>48	5	45.45	23	38.98
Mean + SD	39±14.35		39.35±13.48	

In group A, maximum number of patients (45.45%) had infertility for more than 48 months. In group B, out of 59 patients maximum number of patients (38.98%), had duration of infertility >48 months. The mean duration of infertility in group A was 39±14.35, and in group B was 39.35±13.48.The P value equals 0.9378 was not statistically significant.

Table 6: Type Of Infertility

Type of Infertility	Group A: S.Chlamydia IgG +ve (n=11)		Group B: S.Chlamydia IgG –ve (n=59)		Total n =70	
	No.	%	No.	%	No.	%
Primary	4	36.36	37	62.79	41	58.57
secondary	7	63.64	22	37.21	29	41.43

In group A, 63.64%) patients had secondary infertility and 36.36% had primary infertility. In group B, 37 (62.79%) had primary infertility whereas 37.21% had secondary infertility. Out of all infertile women 58.57% had primary infertility and 41.43% had secondary infertility.

Table 7: Type Of Contraception

Type of Contraception	Group A: S.Chlamydia IgG +ve (n=11)		Group B: S.Chlamydia IgG –ve (n=59)	
	No.	%	No.	%
NONE	5	45.45	38	64.41
BARRIER	3	27.27	12	20.34
OCP	0	0	1	1.69
IUCD	3	27.27	8	13.56

In group A maximum number 45.45% of the patients had not used any contraception, 27.27% patients each had used barrier method and intrauterine contraceptive device. In group B 64.41% patients had not used any contraceptive method, 20.34% used barrier method, 13.56% IUCD and 1.69% had used OCP.

Table 8: Socioeconomic Status:

SES	Group A: S.Chlamydia IgG +ve (n=11)		Group B: S.Chlamydia IgG –ve (n+59)		Total n=70	
	No.	%	No.	%	No.	%
Upper	2	18.18	13	22.03	15	21.43
Middle	3	27.27	23	38.98	26	37.14
Lower	6	54.54	23	38.98	29	41.43

In group A, maximum number of patients 54.54% belonged to lower socioeconomic status followed by middle socioeconomic class and lastly by upper class. In group B, maximum number of patients 38.98% belonged to middle and lower socioeconomic class followed by upper socioeconomic class. The P value was 0.6224.

Table 9: Habitat Distribution

Habitat	Group A: S.Chlamydia IgG +ve (n=11)		Group B: S.Chlamydia IgG –ve (n=59)		Total n=70	
	No.	%	No.	%	No	%
Rural	8	72.72	34	57.63	42	60
Urban	3	27.28	25	42.37	28	40

In group A, 72.72% of women belonged to rural habitat while only 27.28% belonged to urban habitat. In group B, 57.63% of women belonged to rural habitat while only 42.37% belonged to urban habitat. The P value was 0.5065.

Table 10: Literacy Distribution

Education	Group A: S.Chlamydia IgG +ve (n=11)		Group B: S.Chlamydia IgG –ve (n=59)	
	No.	%	No.	%
Illiterate	5	45.45	13	22.03
Primary school	3	27.27	14	23.73
High school	2	18.18	21	35.60
University	1	9.09	11	18.64

In group A maximum number of infertile women were illiterate (n=5,45.45%), (n=3, 27.27%) women were educated till primary school, (n=2, 18.18%) women till high school and (n= 1, 9.09%) were educated till university. In group B, maximum number of women (n=21, 35.60%) were educated till high school and (n=13, 22.03%) women were illiterate. The P value was 0.3374.

DISCUSSION

Infection with C. trachomatis is an important cause of sexually transmitted disease worldwide with extensive consequences for fertility as given in western literature is believed to be 4.2% but with regards to Indian subcontinent the data is lacking. Challenge faced with Chlamydial disease is that as many as 70-80% infection is asymptomatic and diagnosis and identification of patients is hampered by lack of rapid, easy, sensitive and specific methods In our study 11 out of 70 infertile women (15.71%) had serum chlamydia IgG

antibody test positive and 59 (84.29%) had negative test. **Markled et al (2013)**[5] found 37.5% to be serum chlamydia positive out of 80 infertile women.**Singh et al (2016)**[2] in their study found only 5% (10/200) of women to be seropositive. Prevalence of *C. trachomatis* varies with the population under study and the sensitivity of the laboratory method used. Also hospital or clinical based data does not represent the true prevalence of the problem of chlamydial infection in the whole country.

In this study the peak age group for Chlamydia trachomatis infection was 25-29 yrs (52.38%) while in **Wisal et al (2010)**[9] the peak age group was between 15-24yrs (84%), which is higher than the frequency of our study. This could be due to different cultural settings where sexual intercourse started at an earlier age. **Nwankwo (2014)**[3] in their study found the peak age group between 25-29yrs (65%) which is comparable to our study.

In patients with serum chlamydia IgG positive 90 % had an early onset of sexual life (before 24 years of age) and mean age of onset was 21.81±1.88 years.**Duncan M et al (1992)**[14] found that most important factor in epidemiology of serum chlamydial infection was age at first coitus (p<.0001). In his study 90% had onset of sexual life before 18 years.

Most cases (45.45%) of seropositive patients had longer duration of infertility of >48 months which were comparable to **Al kattan et al (2013)**[6].Longer duration of infertility in chlamydia infection could be due to the fact that each subsequent episode of PID double the risk for tubal factor infertility and antichlamydial IgG antibodies persists for extended periods in some women Out of 11 patients who were chlamydia positive, only 4 (36.36%) had primary infertility and 7 (63.64%) had secondary infertility. **Malik et al (2009)**[10] also found that *C. trachomatis* infection was more common in women with secondary infertility. This increased susceptibility could be due to their longer period of active sexual life thus enhancing their exposure to chlamydial infection. In Patients without serum chlamydia IgG antibodies negative 62.71 % had primary infertility. This is comparable to **Singh et al (2016)**[2] in which 30% of patients with positive antibody titre had primary infertility in contrast to 64.73 % with negative titres. Association of seropositivity with type of infertility was significant in their study. However,it is insignificant (p=0.18) in our study.

Use of contraception in infertile women in our study was 27 cases (38.57%). Our results were comparable to **Al kattan et al (2013)**[6] who found that 22 (18.2 %) of infertile women used contraception while **Molana et al (2003)**[12] found that the use of contraception was 66%. This could be due to different cultural settings. **Cottingham et al (1992)**[13] estimated protective effect of barrier methods against chlamydial infection and found it to be 0.34.

In our study no statistically significant association was found between socio economic status and chlamydia infection and this result was comparable to **Balakrishnan et al (2017)**[1]**.** There was no statistical significance in difference of habitat distribution in two groups. (P= 0.5065).The reason for this is not clear although other studies have also found little association with socioeconomic status. In patients with serum chlamydia IgG antibody test positive maximum number of infertile women were illiterate (45.45%) which was comparable to Foroozanfard **et al (2013)**[4] who found that 70% of cases had high school or less than high school education and 92% of women were not employed.

CONCLUSIONS

The various conclusions drawn from the study were as follows:

- Majority of serum Chlamydia IgG antibody positive cases were younger 21-29 years. Due to increased awareness and health facilities, more number of cases are seeking infertility treatment at an early age.
- Around three fourth (72.73%) in group A and half (52.54%) in group B had early onset of sexual activity (20-24 years).
- Maximum (61.43%) of the patients had not used any contraception in past and 21.43% patients had used barrier method. None of the patient using barrier method had seropositivity and this emphasizes the continued need for promoting barrier methods of contraception for protection against sexually transmitted diseases.
- Maximum (41.43%) patients in the study belonged to lower socio economic status. More than half (60%) patients were from rural habitat. This reflects the overall population distribution in India.
- More than half (54.55%) and three fourth (77.97%) from Group A and Group B were illiterate. Because of their educational status, awareness of health problems and availability of resources, majority of case seek medical attention.
- Prevalence of serum chlamydia in the studied population was 15.71%.

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