

## SEROPREVALENCE OF CHLAMYDIA TRACHOMATIS INFECTION IN WOMEN WITH BAD OBSTETRIC HISTORY AND INFERTILITY

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### ABSTRACT :

*Chlamydia trachomatis* has currently emerged as the most common sexually transmitted pathogen. It is usually asymptomatic and is difficult to diagnose clinically. It is one of the causes for bad Obstetric History (BOH) and infertility. Women at highest risk often have the least access to health care facilities. Therefore there is a need for a rapid, simple, inexpensive and non-invasive test to detect *C. trachomatis* infection. Serological testing forms the mainstay of diagnosing the disease and to treat BOH and infertility. Hence the present study was conducted. Enzyme Linked Immunosorbent Assay (ELISA) was used for detection of IgG antibodies against *C. trachomatis*. Out of 130 cases, 65 had history of BOH, 40 had history of infertility and 25 healthy pregnant women (HPW) were used as controls.

The seropositivity for *C. trachomatis* in the study was 25.4% (33). Out of 65 cases of BOH, seropositivity was 27.7% (18). Out of 40 cases of infertility, seropositivity was 35% (14) and out of 25 cases of HPW seropositivity was 4% (1). In BOH cases, women with history of two abortions showed seropositivity of 7.3% and women with history of three or more abortions showed seropositivity of 62.5%. Hence, seropositivity of *C. trachomatis* infection was found to be significant among women with BOH and infertility as compared to HPW.

**Key words:** *Chlamydia trachomatis*; infertility; bad obstetric history; ELISA.

### INTRODUCTION

*Chlamydia trachomatis* has currently emerged as the most common sexually transmitted pathogen.<sup>1</sup> Chlamydia infection is highly prevalent in sexually active women and is associated with adverse outcome of pregnancy. Since the infection is amenable to antibiotic therapy, screening and appropriate treatment may improve the outcome.<sup>2</sup>

If not treated properly, 20-40% newborns may develop Chlamydial conjunctivitis and 10-20% develop chlamydial pneumonia.<sup>2</sup> Bad obstetric history (BOH) and infertility are major complications of genital Chlamydial infection constituting enormous morbidity and socio-economic burden. Mucopurulent cervicitis is one of the most frequent infections seen in women with genital Chlamydial infection. Cervicitis leads to salpingitis, which is a cause for infertility and ectopic pregnancies.<sup>3</sup>

Early diagnosis and treatment is one of the most cost effective means of preventing the long term sequelae of chlamydial infections.<sup>4</sup> Chlamydial serology was found to be a rapid, simple, inexpensive and non-invasive test for BOH and infertility that matches or surpasses the predictive value of most standard fertility tests.

### MATERIALS AND METHOD

The study was conducted in Department of Microbiology, JJM Medical College, Davangere, Karnataka from January 2005 to June 2006. For the present study a total of 130 blood samples were collected from women attending to Bapuji Hospital (BH), Chigateri General Hospital (CGH) and Women and Children Hospital (WCH). Out of which 65 were from BOH cases, 40 from infertility cases and 25 HPW, served as the control.

About 3ml of blood was collected with all aseptic precautions. Blood was allowed to clot at room temperature. Then serum was separated by dislodging the clot and centrifugation at 3000 rpm for 5 minutes. The serum was then transferred into aliquot vials. One drop of 1% sodium azide was added to the serum as preservative. It was labeled and kept in the deep freezer of the refrigerator.

### Method used:

ELISA was used for detection of IgG antibodies to *Chlamydia trachomatis*. ELISA was done on all 130 serum samples. The ELISA (Ridascreen® *Chlamydia trachomatis*

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IgG) kit for detection of IgG antibodies was procured from R-Biopharm AG, Germany. **Test was done as per manufacturer's instruction.**

## RESULTS

Out of 130 cases, 65 had history of BOH, 40 had history of infertility and 25 healthy pregnant women (HPW) were used as controls. The seropositivity for *C. trachomatis* in the study was 25.4% (33). Out of 65 cases of BOH, seropositivity was 27.7% (18). Out of 40 cases of infertility, seropositivity was 35% (14) and out of 25 cases of HPW seropositivity was 4% (1). (Table 1).

It shows that the seropositivity in BOH and infertility as compared to HPW is statistically significant as p value is less than 0.05. Out of 65 BOH cases, 41 cases with the history of two abortions showed seropositivity in 7.3% (3) cases. The remaining 24 cases with history of three or more abortions showed seropositivity in 62.5% (15) cases (Table 2).

### Seropositivity in women with BOH:

In the present study seropositivity of *C. trachomatis* infection in women with BOH was 27.7%. The results were comparable with the studies conducted by Kishore J et al (26.4%)<sup>5</sup> and Avasthi K et al (26%).<sup>6</sup> High percentage positivity of 50% has been reported by Sharma K et al<sup>7</sup>. In the present study, women with two abortions showed a positivity of 7.3% as compared to women with three or more than three abortions who showed a positivity of 62.5%. These results correlate well with the study conducted by Witkin et al.<sup>8</sup> The study conducted by Witkin et al showed low percentage positivity of 12.1% in women with two abortions, followed by 35% in women with three or more abortions.

### Seropositivity in women with infertility:

Seropositivity for *C. trachomatis* infection among women with infertility was 35% which correlates well with the study conducted by Sharma. M et al (48%)<sup>9</sup>. Low percentage positivity of 13.5% has been reported by Witkin et al.<sup>6</sup> High percentage positivity of 68% was reported in a study conducted by Sharma K et al<sup>7</sup>.

### Seropositivity in women with HPW:

In the present study, the seropositivity in HPW was 4%. This study correlates well with the study conducted by Sawhney et al (4.17%).<sup>10</sup> High percentage positivity of 10% was showed by Sharma K et al<sup>7</sup>.

**Table 1 : Seropositivity of *C. trachomatis* in relation to clinical diagnosis**

Clinical diagnosis	No. of cases	No. of seropositive cases (in %)	No. of negative cases (in %)
BOH	65	18 (27.7%)	47 (72.3%)
Infertility	40	14 (35.0%)	26 (65.0%)
HPW	25	1 (4.0%)	24 (96.0%)
Total	130	33 (25.4%)	97 (74.6%)

P = 0.017 (P < 0.05), Significant

**Table 2 : Seropositivity of *C. trachomatis* in relation to number of abortions in BOH**

NO. OF ABORTIONS	NO. OF CASES	NO. OF POSITIVE CASES (%)	NO. OF NEGATIVE CASES (%)
2	41	3 (7.3)	38 (92.7)
≥ 3	24	15 (62.5)	9 (37.5)
Total	65	18 (27.7)	47 (72.3)

## DISCUSSION :

Chlamydia *trachomatis* infection has increased in last few years and it is now considered an important cause of non specific urethritis, cervicitis and pelvic inflammatory disease (PID) in women, leading to infertility and bad obstetric history. Post infectious tubal damage is responsible for 40-50% of ectopic pregnancy and 30-40% of infertility.<sup>11</sup>

Chlamydia *trachomatis* is being reported increasingly from all parts of world. The prevalence has been found to vary from country to country. Significantly high titre of IgG antichlamydial antibodies were detected in various studies as compared to our study.<sup>11</sup> Conway et al<sup>12</sup> found antichlamydial IgG antibodies in 75% of women with infertility. Tyagi et al<sup>13</sup> observed high titre IgG antibodies in 74.07% of women with infertility and 5% of control group. Significant titre of IgG antichlamydial antibodies were observed in 50% of patients with bad obstetric history. Quinn et al found IgG antibodies in 57.6% of cases. Shivananda et al<sup>14</sup> observed high titre IgG antibodies in 55.5% of both cases.

The difference in seropositivity rates between the cases and controls is due to increased susceptibility of antenatal cases to *C. trachomatis* infection during sexual activity and increased proliferation of the organism in those with ante partum infection, due to the lowered immunity in

pregnancy.<sup>15</sup> Women with two abortions and women with three or more than three abortions revealed a seropositivity of 7.3% and 62.5% respectively due to accumulated Chlamydial infections. This emphasizes the need for regular screening of pregnant women and timely treatment to prevent morbidity and mortality of the infants born to such mothers.<sup>2</sup>

In a study Bell et al found that the peak IgG levels were noted between 24 and 669 days, suggesting that IgG may take several years to become negative and sensitivity of IgG detection was 100%. However, IgM were seen on 59th day and it gave high false positivity rate. Moreover, due to high rate of recurrence antibody determination may not differentiate between the recurrence and convalescence until paired sera are tested which is not cost effective tool. Therefore, detection of antichlamydia IgG antibodies which is more sensitive and specific was performed in our study.<sup>16</sup>

Chlamydia trachomatis is one of the most common bacterial sexually transmitted diseases and most infections caused by Chlamydia trachomatis being asymptomatic, result in a large reservoir of unrecognized, and infected individuals capable of transmitting the infection to sexual partners. Chlamydia trachomatis if detected earlier and given proper treatment, can minimize the complications in these patients.<sup>11</sup> Isolation of Chlamydia trachomatis is the most reliable diagnostic method followed by direct immunofluorescence assay.<sup>16</sup> However, in the absence of requisite infrastructure and skills for culture and for direct immunofluorescence assay, indirect ELISA for detection of IgG antibodies can play a significant role in screening for C. trachomatis infection in women with BOH and infertility. Screening of infertile women for C. trachomatis is recommended in the first year of infertility itself so that early therapeutic intervention can be instituted to allow women to conceive normally.<sup>1</sup>

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