

SHORT COMMUNICATION

Seroevidence of *Chlamydia trachomatis* antibody in infertile women in University of Benin Teaching Hospital (Ubth) Benin City, Nigeria

Ibadin, K. O. ^{1*}, Onaiwu .I. Enabulele, O. I. ², Eghafona, N. O. ² and Aziken, M. E. ³

¹Embryologist/Biomedical Scientist, Human Reproduction Research Program (HRRP), Department of Obstetrics &Gynecology, University of Benin, Benin City, Nigeria.

²Department of Microbiology, University of Benin, Nigeria.

³Department of Obstetric and Gynecology, University of Benin, Benin City, Nigeria.
E-mail: Kenbadin2@yahoo.com.

Received 23 February 2009; received in revised form 14 May 2009; accepted 16 June 2009

ABSTRACT

The role of *Chlamydia trachomatis* in the pathogenesis of Pelvic inflammatory disease and majority of cases of salpingitis are well acknowledged in women. A total of 213 sera from infertile women were tested for antibodies to *Chlamydia trachomatis* by using an indirect solid phases enzyme Immuno absorbent commercial ELISA test. Women with confirmed Hysterosalpinographic report suggesting tubal occlusion (tubal factor infertility) had 92 (43.2%) followed by 63 (29.6%) infertile women with infertile male partner and 58 (27.2%) were having unexplained infertility. Out of the tubal factor (TF) infertile women 40 (18.8%) were seropositive for *Chlamydia trachomatis* antibodies, as against 19 (8.9%) in the group of women with normal patent tubes and 10 (4.6%) women with infertile male partner. In this study there was a statistical significant correlation between the infertile women with tubal factor infertility in relation to seroevidence of *Chlamydia trachomatis* infection with $p<0.05$. There was no age bias in the serodetection of *Chlamydia trachomatis* antibodies. The seropositivity of *Chlamydia trachomatis* is an indication that the organism may be an independent risk factor in the development of an inflammatory process leading to scarring of the uterine tubes in women and thereby causing infertility.

Keywords: *Chlamydia trachomatis*, seroevidence, infertile women

INTRODUCTION

Chlamydia infections are now reported to be the most prevalent and among the most damaging of sexually transmitted diseases worldwide (Falk *et al.*, 2005). Its manifestations are well acknowledged in women in whom it is responsible for the majority of cases of salpingitis (Moller and Mardh, 1980; Cohen *et al.*, 2005) and pelvic inflammatory disease and thus accounts for a large number of cases of female factor infertility (Bjerke and Purvis, 1992; Eggert-Kruse *et al.*, 1997). More than 70% of women with signs of tubal damage have circulating antibodies *C. trachomatis* compared to none in a group of controls with normal fallopian tubes (Moore *et al.*, 1992) reported a 64% incidence of Chlamydial antibodies in women with residual inflammatory adnexal lesions, compared to 28% in women with normal adnexae. The implication is that the organism has a predilection the female may also have relevance to its pathological significance in the male.

MATERIALS AND METHODS

A total of 213 sera were obtained from women undergoing In Vitro fertilization/Human Research Reproduction Programme treatment at University of Benin Teaching Hospital from June 2007 to October 2008. All the women had hysterosalpinogram (HSG) as part of their infertility investigations. Those female patients with HSG report suggesting tubal factor infertility or occlusion were recruited into this study when they began the first IVF treatment. Semen analysis was carried out according to WHO criteria's of 1999. The semen samples were collected by masturbation after at least 3-5days abstinences. Semen volume, concentration of spermatozoa, the percentage motility, morphology and vitality were determined. Base on the routine investigations described the couples were categorized into various groups according to possible causes of infertility. The laboratory employed a comprehensive internal quality control programmed for semen analysis based on World Health Organization's 10th Semenology and Cervical Cytology workshop 2008 of which the author of this study was a participant.

Seroanalysis of *Chlamydia trachomatis*

A 3-4 mL of blood sample was collected from each female patient who was allowed to clot to aspirate the serum for the detection of the antibody to *C. trachomatis* using the Immunocomb *C. trachomatis* IgG test which is an indirect solid. Phases Enzyme Immuno Absorbent (EIA) in line with WHO 1999 guidelines for the laboratory diagnosis of *C. trachomatis* infection with a performance characteristic of 95% sensitivity and 90% specificity.

RESULTS

A total of 69 (32.4%) out of the 213 were seropositive for the antibody to *C. trachomatis*. Tubal factor infertile women had 40 (18.8%), women with unexplained infertility with patent tubes 19 (8.9%) and women with infertile male partners 10 (4.9%) (Table 2). Using the Chi-square there was significant correlation between the seropositivity of *C. trachomatis* and women with tubal factor infertility $p < 0.05$. There was no age bias in the seroevidence of the organism in this study as the age groups were affected (Table 1).

Table 1: Number of female patients with seropositive *C. trachomatis* in relation to their age

Infertility variables	No. examined	No. positive	% Positive
Tubal factor infertility (TFI)	92	40	43.4
Unexplained infertility	58	19	32.7
Women with infertile male partners	63	10	15.8
Total	213	69	32.4

Table 2: Seroevidence rate of *C. trachomatis* in infertile women with tubal factor, infertile male partners and unexplained infertility

Age (Yrs.)	No. examined	No. positive	% Positive
19-23	21	3	14.2
24-28	49	18	36.7
29-33	58	23	39.6
34-38	64	18	28.1
39-38	18	6	33.3
>43	3	1	33.3
Total	213	69	32.4

DISCUSSION

Since antibodies to *C. trachomatis* were found in female patients with tubal factor infertility, this study suggests that *Chlamydia* is involved in other pathogenesis of Pelvic Inflammatory Diseases (PID) which may cause infertility

due to compromised function of the uterine tubes. An earlier study Gump *et al.*, (1993) supports this implication because the presence of *C. trachomatis* was detected in patient with cervicitis and adnexitis.

This study recorded a total seropositive rate of 32.4% out of 213 investigated serologically. Female patients with tubal factor infertility contributed 18.8% followed by 8.9% from female with unexplained infertility (patent tube) and 4.9% from women with infertile male partners.

Seropositivity of *C. trachomatis* was expected to dominate in patients with tubal factor infertility based on the result of previous work (Gump *et al.*, 1993, Eggertkruse *et al.*, 1997). *C. trachomatis* is a common cause of tubal factor infertility. Its manifestation is well acknowledged in women in whom it is responsible for majority of cases of salpingitis and Pelvic inflammatory disease (Wang *et al.*, 1997) and this account for a range number of cases of female factor infertility (Moore *et al.*, 1992) more than 70% of women with signs of tubal damage have circulating antibodies to *C. trachomatis* compared to none in a group of controls with normal fallopian tubes (Paavonen, 1996). This assertion is also similar to the findings in this study where women with tubal factor infertility recorded 18.8% compared to 8.9% of women with normal fallopian or patent tubes obtained in this study. Similarly, Bjerke and Purvis (1992) reported 64% incidence of *Chlamydia* antibodies in women with residual inflammatory adnexal lesions, compared to 28% in women with normal adnexal. The implications is that the organism has a predilection for inducing inflammatory changes of the deep Pelvic organs in female. This may also have relevance to its pathological significance in the male.

In this study, there is an indication that a high degree of transmission of *C. trachomatis* occurs between infertile partner without either of them registering symptoms. Sera listed in this work were not derived from patients with acute disease. The female patients had no symptoms of Pelvic inflammatory diseases when they visited the infertility clinic. Perhaps infection with *C. trachomatis* is primarily asymptomatic as suggested in an earlier study with sexually active men and women attending Sexually Transmitted Diseases clinic. Bjerke and Purvis (1992) had noted that 76% of the male partners of *C. trachomatis* seropositive female exhibited seroevidence of infection. As the pathological significance of *C. trachomatis* in the female is well documented overtime, such chronic infections in females may cause tubal or endometrial pathology. This presumably explains the higher incidence of active *Chlamydia* infection in the male partners of women with tubal pathology (Paavonen, 1996).

CONCLUSIONS

In conclusion this study indicated and agreed with the hypothesis that *C. trachomatis* may be an independent risk factor in causing deep-seated tubal occlusion and pelvic inflammatory diseases in women thereby bringing about infertility.

REFERENCES

- Bjerke, S. and Purvis, K. (1992).** *Chlamydia* serology in the investigation of infertility. *Human Reproduction* **7**, 136-130.
- Cohen, C. R., Mugo, N. R., Astete, S. G., Odondo, R., Manhart, L. E., Kiehlbauch, J. A., Stamm, W. E., Waiyaki, P. G. and Totten, P. A. (2005).** Detection of *Chlamydia trachomatis* in women with laparoscopically diagnosed acute salpingitis. *Sexually Transmitted Infection* **81**, 462-466.
- Eggert-Kruse, W., Rohr, G. and Demirakca, T. (1997)** *Chlamydia* serology in 1303 asymptomatic subfertile couples. *Human Reproduction* **12**, 1464-1475.
- Gump, D. W., Gobson, M. and Ashikaga, T. (1993).** Evidence of Pelvic inflammatory disease and its relationship to *Chlamydia trachomatis* antibody and intra-uterine contraception device use in infertile women. *American Journal of Obstetrics and Gynecology* **146**, 153-159.
- Mardh, P. A., Svensson, L. and Westrom, L. (1997).** *Chlamydia trachomatis* infections with acute salpingitis. *New England Journal of Medicine* **296**, 1377-1379.
- Moore, D. E., Foy, H. M., Daling, J. R., Grayson, J. T., Spadoni, L. R., Wang, S. P., Kuo, C. C. and Eschenbach, D. A. (1992).** Increased frequency of serum antibodies to *Chlamydia trachomatis* in fertility due to distal tube disease. *Lancet* **2**, 574-577.
- Nikanen, V., Teerho, P. L., Punnonen, R. and Meurman, O. (1990).** The significance of Chlamydia genital infection in male infertility. *Archives of Andrology* **4**, 57-61.
- Paavonen, J. K. (1996).** Infertility and cervical *Chlamydia trachomatis* infections. *Acta Obstetrica et Gynecologica Scandinavica* **58**, 301-303.
- Toth, A. Lesser, M. L. and Labriola, D. (1996).** The development of infections of the genitor urinary tract in the wives of infertile males and the possible role of spermatozoa in the development of salpingitis, *Surgery, Gynecology and Obstetrics* **159**, 565-569.
- World Health Organization (2008).** Semenology and cervical cytology workshop. Special Programme for Research, Development and Research Training, South Africa.
- World Health Organization (1999).** Laboratory manual for the examination of human semen and sperm-cervical mucus interaction, (4th edition). Cambridge University Press, Cambridge, UK.