Chlamydial Infection and Male Factor Infertility

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Chlamydia trachomatis is supposed to cause infertility in men. But the role of Chlamydia infection in male infertility is not conclusive. Therefore, we designed this study to find the association of Chlamydial infection and male factor infertility. This cross-sectional comparative study was conducted in a university hospital of Dhaka during the period of January-December, 2009. Eighty two infertile and 79 fertile men were enrolled by convenient sampling. Informed consent was obtained from all. Data regarding medical and sexual history were collected in a questionnaire. Serum Chlamydial IgG antibody of the participants were measured by an indirect micro-immunofluorescent assay. Semen parameters were also examined. Chlamydial antibody was positive in 2.4% infertile and 2.5% fertile male but the difference was not significant (p>0.05). The titer was in the grey zone in 2.5% infertile and 1.3% fertile men. The study concludes that the positive antichlamydial antibody titer is not associated with male infertility.

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Key words: Chlamydia, infertility

Introduction

Infertility is defined as the inability to conceive after 1 year of unprotected intercourse.[1] One of the most important and underappreciated reproductive health problems in developing countries is the high rate of infertility and childlessness. The inability to procreate is frequently considered a personal tragedy and a curse for the couple, impacting on the entire family and even the local community.[2] More than 70 million couple suffer from infertility worldwide and 8-12% couples of reproductive age are suffering from infertility in Asian countries.[3]

Most cases of male factor infertility are caused by previous infection of genitourinary tract. Sexually transmitted diseases (STD) are prominent risk factors for infertility in developing countries. The organisms most commonly involved are Chlamydia trachomatis and Neisseria gonorrhoea.[3,4]

Chlamydia trachomatis infections are prevalent worldwide and the prevalence is similar in males and females.[5] It is the most common bacterial sexually transmitted disease supposed to cause urethritis, epididymitis, prostatitis and infertility in men.[5,6] Among sexually transmitted diseases (STDs), infection with Chlamydia trachomatis is considered to play a prominent part in infertility.[7] As C. trachomatis causes a more indolent infection, patients are not motivated to seek treatment, which is an important factor in the rapid spread of Chlamydial infection and the development of complications.[7]

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Infection of the testis and prostate by Chlamydia is implicated in a deterioration of sperms by directly damaging them. Sperm parameters, proportion of DNA fragmentation, and acrosome reaction capacity are impaired with Chlamydial infection. Furthermore, the proportion of male partners of infertile couples with evidence of a Chlamydia infection is greater than that documented in the general population. An effect of male Chlamydial infection on the fertility of the female partner also has been reported.[5] Approximately 75% of CT infections in women and up to 50% of those in men are asymptomatic. Asymptomatic men who are infected with CT are younger than their symptomatic counterparts.[5]

The primary site of infection of CT in males is the penile urethra. It is reported that the bacteria ascend the male reproductive tract and cause epididymo-orchitis and prostatitis.[6] Urethritis by C. trachomatis in male can lead to epididymitis (commonly bilateral) and azoospermia by complete obstruction.[7,8]

Decreased sperm counts and decreased motility often are demonstrated in cases of acute epididymo-orchitis of nonspecific etiology, and this pathology also is consistently associated with high rates of infertility. Ascending urethral infection to the sites of spermatogenesis provides a plausible means by which Chlamydia can interact with and impair sperm function and, thus, affect fertility.[5]

CT-DNA was associated with a significant decrease in total sperm and motile sperm counts. Other studies have shown that men with CT in semen have reduced sperm concentration, motility, velocity, viability, morphology, acrosome reaction and citrate. Thus, CT infection of the male genital tract may contribute to male infertility[9]. Antibodies to C. trachomatis found in the semen are significantly associated with tubal damage in female partners.[10] C. trachomatis IgG in the man of the infertile couple was related to decreased pregnancy rates and to the presence of IgG antibodies in the women.[11]

Methods

This cross-sectional comparative study was conducted in the Department of Gynaecology and Obstetrics Outpatients' Department and in the Department of Biochemistry, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh & CARe Hospital, Dhaka during the period of January-December 2009. Eighty two infertile and 79 fertile men were enrolled by convenient sampling. Informed consent was obtained from all. Data regarding medical and sexual history were collected in a questionnaire. Serum Chlamydial IgG antibody of the participants were measured by an indirect micro-immunofluorescent assay. Semen parameters were also examined.

Results

The mean (±SD) age of the cases and controls were 34.9 (±5.7) and 35.19 (±5.4) respectively with no significant difference ($p>0.05$). Among the male infertile partners 43.9% had primary and 56.1% had secondary infertility. Majority of the participants were nonsmoker but smokers in the two groups did not differ significantly ($p=0.33$). Among the infertile men 46.3% had normospermia and 15.9% had azoospermia. Other conditions were oligospermia (9.8%), aesthenoteratozoospermia (15.9%), aesthenozoospermia (3.7%), oligoaesthenoteratozoospermia (6.1%), oligoaesthenozoospermia (1.2%) and oligoteratospermia (1.2%). All but one control had normospermia.

Chlamydial antibody was positive in 2.4% infertile and 2.5% fertile male but the difference was not significant (p>0.05). The titer was in the grey zone in 2.5% infertile and 1.3% fertile men.

Table I: Distribution of participants by history of smoking of patients

History of Smoking	Case	Control	Total
Yes	32(39.0%)	25(31.6%)	57(35.4%)
No	50(61.0%)	54(68.4%)	104(64.6%)
Total	82	79	161

Table II: Distribution of patients by testicular symptoms

Bilateral atrophic testes	Case	Control
Absent	79 (96.3%)	79 (100%)
Present	3(3.7%)	0(0.0%)

Table III: Distribution of patients by number of sperm in semen

Number of sperm in semen	Case	Control	Total
No sperm in semen	12(14.6%)	0(0.0%)	12(7.5%)
20 million or less sperm / ml	16(19.5%)	1(1.3%)	17(10.6%)
>20 million sperm /ml	54(82)	78(98.7%)	132(82.0%)
Total	82	79	161

Table IV: Comment of semen analysis of the participants

Comment of semen analysis	Case	Control	Total
Aesthenoteratozoospermia	13(15.9%)	0(0.0%)	13(8.1%)
Aesthenozoospermia	3(3.7%)	0(0.0%)	3(1.9%)
Azoospermia	13(15.9%)	0(0.0%)	13(8.1%)
Normospermia	38(46.3%)	78(98.7%)	116(72.0%)
Oligoaesthenoteratozoospermia	5(6.1%)	0(0.0%)	5(3.1%)
Oligoaesthenozoospermia	1(1.2%)	0(0.0%)	1(0.6%)
Oligospermia	8(9.8%)	1(1.3%)	9(5.6%
Oligoteratospermia	1(1.2%)	0(0.0%)	1(0.6%)
Total	82	79	161

Table V: Distribution and comparison of participants by Chlamydial antibody titer

Status of serum Chlamydial antigen	Case	Control	Total
Negative	78(95.1%)	76(96.2%)	154(95.7%)
Positive	2(2.4%)	2(2.5%)	4(2.5%)
Grey zone	2(2.4%)	1(1.3%)	3(1.9%)
Total	82	79	161

Discussion

The present study revealed that the prevalence of anti-chlamydial antibody (IgG) was positive in 2.4% participants of infertile male partner and in 2.5% of normal fertile control counterpart. The titer was in the grey zone in 2.5% of infertile and in 1.3% in fertile male partners. The difference of the positivity of Chlamydial antibody titer in fertile and non-fertile male partners' serum is not significant (p>0.05).

Although many studies found abnormality in semen quality in patients with Chlamydial infection, no conclusion has yet been drawn that Chlamydial infection is a risk factor for male infertility. Some of the studies have supported our findings but others do not. A cross-sectional study by Orellana et al found the prevalence of C. trachomatis 4.81% which is almost double of our study.[12] Magder et al (1988) Cultured 2,320 patients to determine clinical and epidemiologic factors associated with genital chlamydial infection. In a subgroup of men without gonococci the isolation rates was 3%.[13]

Ombelet and Chan stated that most cases of male factor infertility are caused by previous infection of genitourinary tract by Chlamydia trachomatis and Neisseria gonorrhoea.[3,4] The cause-effect relationship between bacterial infections and semen contamination and male infertility is still being debated. It was observed that the presence of bacteria in semen samples of infertile men has a similar prevalence to that observed in fertile males.[14]

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