

EVALUATION OF CHLAMYDIA IN INFERTILE COUPLES

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Abstract

Chlamydia is a common sexually transmitted infection, having deleterious effect on fertility in both men and women. The aim of this study is to assess the couple for chlamydia infection. Sixty infertile couples, without any assessment or treatment for infertility earlier were taken up for study. Endo cervical swab of the wife and a sperm swab from the semen sample given for analysis by the husband were analysed by NAAT PCR technique. 22 couples are chlamydia positive; in 21 the wife, in 13 the husband were positive; One man was positive for chlamydia, his wife being negative; Eight women were positive, but their husbands were negative for chlamydia.

Sperm swab from the semen collected for semen analysis is an easy, practical way of testing the man for chlamydia. When more than one third of the couples are positive for chlamydia, it is logical that, screening for chlamydia be included in the infertility assessment protocol.

Keywords: Chlamydia; Infertility; NAAT; Semen swab

Introduction

Chlamydia is a common sexually transmitted infection in younger men and women. It is caused by a gram negative, intracellular bacterium- chlamydia trachomatis, sero type D-K; the other diseases caused by the same organism with other sero types are- trachoma and lympho granuloma venereum. Chlamydia is more common in women than in men 1: 1.2 to 2.0. 75% of infected females are asymptomatic and 50-60% of infected males are asymptomatic, hence an asymptomatic carrier is a real epidemiological concern (1). It is a disease of sexually active teens and youngsters in 20s, less common after 30s. Untreated chlamydia can persist for years in the persons without manifestations.

Chlamydia is transmitted by peno-vaginal sex, anal penetrative or receptive sex, and infrequently by oro-genital sex. In women- urethritis, endocervicitis are primary infections, can ascend in the genital tract to cause endometritis, salpingitis, perihepatitis; the long term sequelae are PID, infertility, ectopic pregnancy, premature labour(2); peripartum transmission to neonate results in conjunctivitis and pneumonia. In men, urethritis is common; can ascend to result in epididymitis, prostatitis; leading to infertility and stricture urethra. In men having sex with men and also in anal sex-proctitis and pharyngitis can occur.

In view of the asymptomatic nature of the disease and even if symptomatic, milder nature of the disease, vague

non specific symptoms- clinical diagnosis is difficult. The diagnosis is made as a part of investigations for STI or infertility or PID. The samples for laboratory testing are- self collected vaginal swabs, urethral and cervical swabs at gynaec examination in women; first void urine, urethral swab and semen in men; pharyngeal and anorectal swabs in MSM.

Molecular tests- Nucleic Acid Amplification Techniques (NAAT) is the gold standard diagnostic test. It can be done by Polymerase Chain Reaction (PCR), Lipase Chain Reaction (LCR), Transcription Mediated Amplification test(TMA), DNA strand displacement amplification (SDA). The test is 95-99% sensitive and almost 100% specific (3). Rapid Point of Care test (PoC) is easy, practical, patient friendly, but sensitivity is 40-70% only (4). Detection of IgM antibodies in the blood of neonate by Enzyme Immune Assay (EIA) can be done. IgG antibodies can be identified serologically a few weeks after the original infection or in chronic cases and hence is useful in cases of PID and infertility.

Chlamydia infection and fertility: in women, PID, chronic salpingitis and tubal damage are the common causes of infertility and ectopic pregnancy. In men, epididymo orchitis and prostatitis can result in low sperm count, low progressive sperm motility and increase in DNA Fragmentation Index (DFI) of semen. Chronic chlamydial infection of male genital tract causing poor semen quality is documented, but results are not consistently proved in every study. Chlamydia can be identified in the semen by NAAT PCR technique. Semen analysis and PCR for

chlamydia can be done on the same semen sample; is easy and practical. Identifying chlamydia in both partners as a part of investigations in infertility work up is logical, but not done often in clinical practice. This study aims at this aspect of infertility evaluation.

Material and Methods:

This study was conducted in the in the infertility clinic in a rural based medical college in South India, during the period January 2018- September 2019. Couples, who came for infertility check up for the first time, never got investigated or treated earlier, in this institution or elsewhere are the subjects of study. Men and women who had antibiotics in the past three months are excluded from the study. Medical officer and medico social worker in the infertility clinic are in charge of follow up. The wife is seen by the gynaecologist and the husband is seen by the surgeon. Cervical mucus swab is collected at the initial gynaecological examination. Sperm swab is collected from the semen analysis sample in the clinical lab.

The cervical swab and the semen swab were analysed for chlamydia by PCR NAAT. In addition to the routine history and clinical examination, special emphasis is laid on sexual history and history of STI. The couples are investigated for infertility as per the protocol of the infertility clinic.

Results

Couples studied and followed up till all investigations are completed—60

Table 1:

Parameter	Men	Women
N=	60	60
Age 20-30 years	37 (61.7%)	54 (90%)
Age 30-40 years	20 (33.3%)	6 (10%)
Age 40-50 years	3 (5%)	0
Primary infertility	50 (83.3%)	51 (85%)
Secondary infertility	10* (16.7%)	9** (15%)
Associated diseases	DM-2 Htn-1	DM-1+ GDM-1 Htn-1+ PIH-1
Premarital , extra marital sex	27*** (45%)	****
Associated STI	HIV-0 VDRL- <1:8-1 HbsAg-1	HIV-0 VDRL-0 HbsAg-0

Legend: * one man had a child in first marriage: ** two abortions, one is intra uterine and one ectopic: ***pre marital and extra marital sex- sex with a person other than the present wife. One man is a divorcee, married now. Another man having two wives now: **** not elicited from women, so as not to cause embarrassment at first visit.

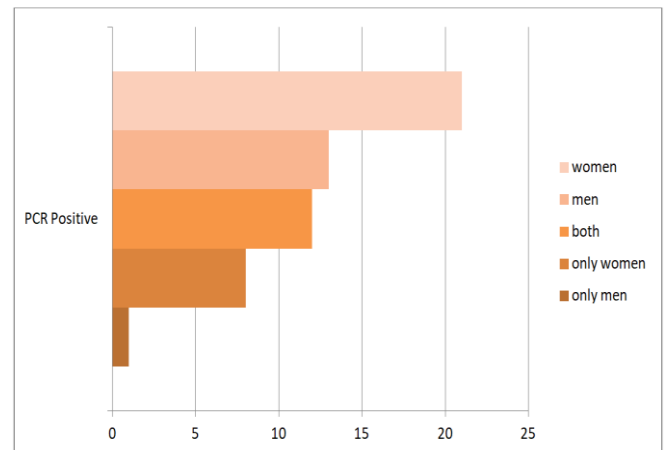
Table 2

Sixty couples were taken up for study. Twenty two couples (36.7%) are chlamydia positive. In these twenty two couples-- 21 women (35%) are positive for chlamydia in

the cervical swab specimen; 13 men (21.7%) are positive for chlamydia in their semen samples; in one, only the husband is positive, but not the wife; in eight, only the wife is positive, but not the husband; in 12 couples (20%), both the husband and the wife are positive for chlamydia.

Table 2:

Chlamydia Positive	Couples-22
Chlamydia Positive	Wife-21
Chlamydia Positive	Husband-13
Chlamydia Positive	Both partners in the same couple-12
Chlamydia Positive	Only in wife not in husband-8
Chlamydia Positive	Only in husband not in wife-1



Graph 1:

As a part of the infertility assessment, all the 60 semen samples were analysed as per the WHO protocol(5). In 41 men (68.3%), all the semen parameters are above the lower reference values. In 19 men (31.7%), at least one of the semen parameters are below the lower reference values; 8 men had less semen concentration; 14 men had less total motility; five men had lower vitality; in two men, morphology was <4% normal. In the 13 men with chlamydia infection, when compared with 47 non infected men, the mean count was 16% less; the mean motility was 23% less. Statistical analysis is not possible in view of the small numbers.

Discussion:

Molecular tests-NAAT; rapid PoC tests; serology studies are the three different methods of identifying the chlamydia, NAAT being the gold standard. Identification of chlamydia will vary with the sample on which the study is done-urine, semen, urethral swab, cervical swab. Even when done on the same variety sample by the same technique, different authors have given positive rates of 3.15% to 91%, that is a huge variation in results.

R. Levy et al conducted a study on asymptomatic males in IVF cycle. Chlamydia was identified in 10.9% of men in semen sample but only one tenth of these positive men

showed positive value in serology (6); where as other researchers quoted more positive rates in serology than in urine or semen swab samples. Studies done by Farida Hamdad Daodi et al –showed positivity for chlamydia in 5.4% in first urine sample, in 2.7% in semen and 0.9% in prostatic sample in the same group of men(7). Maria Salmer et al identified chlamydia positivity in urethral swab in 5 men and in 2 men only in semen sample in the same group of 73 men in infertile couples (9). In infertile couples- the chlamydia was identified in 87% of women and 91% of men by Raymundo Preciado Raiz et al(10). Majtuba Moosavian et al, in infertile couples, quoted chlamydia positivity in 10% of men in semen sample and 14% of women in cervical swab sample(11). In a large group of 30 thousand infertile couples, presented by Yuanchang Zhu et al from China- the overall chlamydia positivity was equal- 3.15% -in both male and female partners (12).

In a study done by Magda Ramadan Abdu Alwadood et al on cervical swab of infertile women, 29.3% are positive for chlamydia ; whereas only 5% of controls were chlamydia positive(13). Even studies done from the same country, there is a wide variation in chlamydia positivity. In Tunisia- in a study done by R. Gdoura et al 35.9% of males and 38% of females in the infertile couples are chlamydia positive(14); where as in a study done by Hanen Sellam et al 15.2% of men in infertile marriage are chlamydia positive(15).

In the present study done on sixty infertile couples-21 (35% of) females and 13 (21.7% of) males are positive for chlamydia , done on cervical swab and semen sample swab by PCR technique.

Further in an infertile couple, chlamydia can be positive in both the partners, only in husband not in wife or only in wife not in the husband. In the present study of 60 couples- both husband and wife are positive in 12; only man not the woman is positive in 1 ; only woman not the man positive in 8.

Beyond the purview of this study- the semen parameters of chlamydia infected men and non infected men - evaluated by Hanen Sellami et al—the semen of infertile men positive for chlamydia trachomatis showed lower mean sperm count and lower rapid progressive motility of spermatozoa, when compared to uninfected men with statistical significance. The other parameters like morphology, vitality of semen, though lower in infected men is not statistically significant(15).

Conclusion:

Considering the role of chlamydia infection in both partners of the infertile couples- in the causation of infertility and in the successes of the treatments- identifying chlamydia infection may be adopted as an integral part of infertility evaluation.

References:

1. Peipert JF. Clinical practice. Genital chlamydial infections. *N Engl J Med.* 2003;349:2424–30.
2. MichouIV,ConstantoulakisP,MakarounisK,GeorgoulasG,Kapetanios V,TsilivakosV.Molecularinvestigationofmenstrualtissueforthe presence of Chlamydia trachomatis, Ureaplasma urealyticum and Mycoplasmahomin is collected by women with a history of in fertility. *J ObstetGynaecolRes.*2014;40(1):237–42.doi:10.1111/ jog. 12165. [PubMed: 24118383
3. Watson, E. J., Templeton, A., Russell, I., Paavonen, J., Mardh, P. A., Sary, A. and Pederson, B. S. (2002) The accuracy and efficacy of screening tests for Chlamydia trachomatis: a systematic review. *J Med Microbiol* 51:1021–1031
4. Swain, G.R.; McDonald, R.A.;Pfister, J.R.; Grdus, M.S.; Sedmak, G.V. and Singh A. (2004): Decision analysis: point-of-care Chlamydia testing vs laboratory-based methods. *Clin Med Res;* 2:29–35.
5. World Health Organisation (1999) WHO Laboratory Manual for the Examination of Human Semen and Sperm Cervical Mucus Interaction. 4th edition. Cambridge, United Kingdom: University Press.
6. R. LEVY*, M.-P. LAYANI-MILON, S. GISCARD D'ESTAING*, F. NAJIOULLAH, J. LORNAGE*, M. AYMARD and B. LINAinternational journal of andrology, 22:113±118 (1999)
7. Farida Hamdad-Daoudi,1 Jacques Petit2 and Franc,ois Eb1Journal of Medical Microbiology (2004), 53, 985–990
9. Mario Salmeri, Angela Santanocita, Maria Antonietta Toscano, Angela Morello, Daniela Valenti, Sandro La Vignera, Salvatore Bellanca, Enzo Vicari & Aldo E. Calogero (2010) Chlamydia trachomatis Prevalence in Unselected Infertile Couples, *Systems Biology in Reproductive Medicine*, 56:6, 450-456, DOI: 10.3109/ 19396361 003792853
10. MojtabaMoosavian1,2,AtaallahGhadiri3,4,SarehAmirzadeh5,MohammadRashno2,3,Maryam Afzali1 and Khadijeh Ahmadi Jundishapur J Microbiol. 2019January;12(1):e84954.
11. Raymundo Preciado Ruiz,* Raúl Rodrigo Arredondo Merino,** Antonio García Luna,* David Manterola Álvarez,* Noemí Blanco García,*** Juan Carlos Martínez Chequer****
12. Yuanchang Zhu1,2, Biao Yin3, Tonghua Wu4, Lijun Ye4, Chunmei Chen4, Yong Zeng4 and Yaou Zhang2*Zhu et al. *Reproductive Health* (2017) 14:5 DOI 10.1186/s12978-016-0271-4
13. Magda Ramadan Abdu Alwadood - 1Manal M. Darwish –2Ali ShokerAz. *J. Pharm Sci.* Vol. 48, September, 2013.
14. Gdoura R, Keskes-Ammar L, Bouzid F, Eb F, Hammami A, et al. (2001) Chlamydia trachomatis and male infertility in Tunisia. *Eur J Contracept Reprod Health Care* 6: 102–107.
15. Sellami H, Znazen A, Sellami A, Mnif H, Louati N, et al. (2014) Molecular Detection of Chlamydia trachomatis and Other Sexually Transmitted Bacteria in Semen of Male Partners of Infertile Couples in Tunisia: The Effect on Semen Parameters and Spermatozoa Apoptosis Markers. *PLoS ONE* 9(7): e98903. doi:10.1371/ journal.pone.0098903