



ASSOCIATION OF MALE GENITAL TUBERCULOSIS WITH INFERTILITY

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ABSTRACT **BACKGROUND:** To study the association of male genital tuberculosis with infertility and To make early diagnosis of male genital tuberculosis and prevention of further sequelae. **METHOD:** 100 couples undergoing evaluation for infertility were chosen after taking consent during one year. Couples of active married life of one year and whose having regular unprotected intercourse were included. Routine work up of males and females for infertility was done. For semen, AFB culture by BACTEC Radiometric system and TB-PCR test was done. **RESULTS:** 14% of females and 7% of males had positive past history of tuberculosis. This indicates genitourinary tuberculosis may develop after primary pulmonary infection. 6% cases had evidence of B/L old healed tuberculosis and 4% had findings suggestive of tuberculosis. Out of these 10 cases, 9 were positive by semen MTB-PCR test and 3 were positive by BACTEC Culture. Findings of old healed tuberculosis includes presence of heterogenous calcified zones in lung fields. TB-PCR was positive in 18 cases which were culture positive. Out of 21 cases which were semen TB-PCR positive, 57.14% had total sperm counts less than 15 mill/ml taken as significant as per lower reference limits according to WHO 2010 Guidelines. Out of 36 females which were TB-PCR positive, 12 had husbands with TB-PCR semen (33.33%). **CONCLUSION:** All males in infertile couples should be evaluated for genital tract tuberculosis concurrently with female partner evaluation

KEYWORDS : Infertility , Genitourinary Tuberculosis , TB -PCR

INTRODUCTION

Infertility is generally defined as one year of unprotected intercourse without pregnancy. Some prefer the term subfertility to describe women or couples who are not sterile but exhibit decreased reproductive efficiency. Approximately 85-90% of healthy young couples conceive within 1 year, most within 6 months. Infertility therefore affects approximately 10-15% of couples and is an important part of the practice of many clinicians. Genital TB[GTB] in male is uncommon, and the most common genital sites of tuberculous infection are epididymis and prostate. Isolated testicular TB is extremely rare, comprising only 3 percent of GTB. Infertility in GTB is a result of obstruction at the terminal portion of the ejaculatory duct, resulting in dilatation of the proximal ductal system including the vas deferens preventing seminal vesicle secretions from reaching the ejaculate. Patients present with azoospermia or aspermia. Sole male factor is responsible in 30% of cases. Male infertility may result from a variety of causes which can be divided into 4 major categories: -

- Hypothalamic-pituitary disorder (1-2%)
- Primary gonadal disorder (30-40%)
- Disorders of sperm transport (10-20%)
- Idiopathic (40-50%)

MATERIALS AND METHODS

This is a hospital based descriptive type of observational study, carried out in the Department of Obstetrics and Gynecology, Zenana Hospital, SMS Medical College, Jaipur from April 2012 to March 2013 after obtaining clearance from Ethical Committee. 100 couples undergoing evaluation for infertility were chosen after taking consent. The husband was counseled about the incidence of tuberculosis in males specially in developing countries like India and its small but significant role in infertility. Couples with active married life of 1 year and have regular, unprotected intercourse were included. Females with Congenital malformations of genital tract and tubal block were excluded. Detailed history including past history of tuberculosis was taken. General and gynecological examination was done in all cases. Cases with past history of tuberculosis were inquired about history of antitubercular therapy. Routine work up of males and females for infertility was done. Females were subjected to diagnostic laparoscopy. Endometrial samples were collected and sent for histopathology and TB-PCR & AFB-Bactec Culture after saving in formalin and normal saline respectively. In male partners investigations done are Complete haemogram, ESR, Urine complete examination and culture sensitivity, chest X-ray PA view and husband semen analysis. Semen collection was done after abstinence of 2-3 days. The semen specimen was collected by masturbation directly into a clean container in a private room within or near the laboratory. The semen sample was examined within an hour after collection. After

liquefaction semen analysis included the determination of volume, sperm concentration, motility, morphology, pus cells. For semen AFB culture by BACTEC Radiometric system and TB-PCR test, the sample was collected in normal saline vial and sent to Microbiology Department, SMS Hospital, Jaipur.

In 2010, the WHO published revised lower reference limits for semen analysis, which represent the fifth centile in a population of over 1900 men from eight countries on three continents whose partners conceived within 12 months.

Semen Analysis

	Lower Reference Limits (95% CI) in Fertile Men
Volume	: 1.5 (1.4 - 1.7) ml
Sperm concentration	: 15 (12-16) million/ml
Total sperm number	: 39 (33-46) million/ejaculate
Total motility	: 40 (38-42)%
Progressive motility	: 32 (31-34)%
Normal morphology	: 4 (3-4)%
Vitality	: 58 (55-63)%

Data were statistically analysed by using Chi-square test. Statistical analysis was performed by application of the SPSS Version, Primer of biostatistics computer software. P-value of <0.05 was considered significant.

RESULTS

Total 100 cases of infertile couples were included for this observational study, to evaluate the association of male genital tuberculosis with infertility by using semen-PCR and AFB-Bactec culture of mycobacterium tuberculosis. Mean age of infertile cases was 28.8 ± 3.5 yrs for males and 26.35 ± 3.4 yrs for females. Males were older than females. There was a statistically significant difference in age distribution of male and female cases. There was a highly significant association between semen TB-PCR results with total sperm counts, out of 21 cases [TB-PCR positive], 57.14% had total sperm counts less than 15 mill/ml taken as significant as per lower reference limits according to WHO 2010 Guidelines, Only 19.05% cases has total sperm count >50 mill/ml [P-value 0.05].

TB-PCR positive cases were more in shopkeeper and labour class as these people communicate more with general population. This association was statistically significant (P-value < 0.05). TB-PCR results in males and females, out of 36 females which were TB-PCR positive, 12 had husbands with TB-PCR semen (33.33%), this shows that, if either sex was positive for TB-PCR, opposite sex may also have tuberculosis and this association was statistically significant.

Table – 1 Distribution of Cases According to Age Group

Age Group (in yrs)	Females (n = 100)		Males (n = 100)		Total (n = 200)	
	No.	%	No.	%	No.	%
20	2	2.00	0	0.00	2	1.00
21 - 30	88	88.00	71	71.00	159	79.50
31 - 40	10	10.00	29	29.00	39	19.50
Total	100	100.00	100	100.00	200	100.00

$\chi^2 = 13.074$, d.f. = 2, P = 0.001, HS

Table – 2 Distribution of Cases According to Semen Analysis - Total Sperm Count

Total Sperm Count (mill/ml)	Semen TB-PCR Positive Cases (n = 21)		Semen TB-PCR Negative Cases (n = 79)	
	No.	%	No.	%
Azoospermia	3	14.28	1	1.27
< 15	9	42.86	5	6.33
16 - 50	5	23.81	15	18.99
> 50	4	19.05	58	73.42
Total	21	100.0	79	100.00

$\chi^2 = 30.945$, d.f. = 3, P < 0.001, HS

Table – 3 Association of Husband TB-PCR Results with Their Occupation

Husband Occupation	TB-PCR Positive Cases (n = 21)		TB-PCR Negative Cases (n = 79)		Total (n=100)
	No.	%	No.	%	
Shopkeeper and Labour Class	12	38.71	19	61.29	31
Teacher and Bank / Office Job	9	13.04	60	86.96	69

$\chi^2 = 7.017$, d.f. = 1, P = 0.008, Sig

Table – 4 Distribution of Cases According to Male and Female TB-PCR Results

Females	Males				Total (n = 100)
	TB-PCR Positive (n = 21)		TB-PCR Negative (n = 79)		
	No.	%	No.	%	
TB-PCR Positive	12	33.33	24	66.67	36
TB-PCR Negative	9	14.06	55	85.94	64

$\chi^2 = 4.061$, d.f. = 1, P = 0.04, Sig

DISCUSSION

Infertility is a common problem affecting approx. 10-15% of couples and has great influence on social, economical and psychological wellbeing of a couple. Genital TB is one of the very important causes of infertility. In the past, the female genital tuberculosis was primarily focused in infertile couples and evaluation of male genital tuberculosis was neglected. But now we recognize that male genital tract infection is responsible in significant number of cases. The main cause of male infertility is low semen quality with low sperm counts mostly due to genital tract tuberculosis. In a study of 54 males with tuberculous epididymitis by Viswaroop BS et al (2005), median age of presentation was 32 yrs with interquartile range of 21-37 yrs. Sole-Balcells F et al (1977), conducted a study in 50 patients with a diagnosis of urinary tuberculosis. They showed that all patients with clinical alterations in the genital structures also have alterations in the cytomorphological and/or biochemical study in semen. 75% of the patients without genital lesion showed oligoasthenospermia. Bayasgalan G et al (2004) concluded that most common cause of male infertility were obstructive azoospermia (8.4%), male accessory gland infection (6.7%) and acquired testicular damage (5.4%).

Rupin S Shah et al (2004)¹⁷ found that tuberculosis can affect the epididymis, vas or ejaculatory ducts causing inflammation and fibrosis leading to obstructive azoospermia. They also concluded that epididymal inflammation due to tuberculosis can be completely resolved by AKT followed by steroids, resulting in reversal of azoospermia, provided the patients not had a scrotal abscess and low semen volume. In contrast, Dhole GR et al (2003) found that urogenital infection has a detrimental effect on sperm quality by reducing concentration and motility and possibly affecting the number of morphological normal spermatozoa. Reddy Ravikanth et al (2019) found that male GTB patient presents with azoospermia and

subsequent to orchidectomy and anti-TB drug treatment for 6 months, follow up seminal analysis report demonstrated improvement with a sperm count. Tzvetkov and Tzvetkova (2006) have analyzed history cases of 69 male genital TB patients with infertility, average age was 40.32+/-1.64 years.

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