

Infertility associated with male genital tuberculosis: A case series

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Abstract

Infertility is defined as one year of unprotected intercourse without pregnancy. Sole male factor is responsible in 30% cases of infertility, out of which, 15% is related to genital tract infection including tuberculosis. The Polymerase chain reaction (PCR) technique can accurately diagnose genital Tuberculosis at an early stage. Timely antitubercular therapy can lead to restoration of sperm counts and provide an excellent chance to infertile couples for spontaneous conception. We report a case series of seven cases in which infertility is associated with male genital tuberculosis.

Keywords: Infertility, Genital tuberculosis, MTB-PCR, Oligo-azoospermia

Introduction

Infertility is generally defined as one year of unprotected intercourse without pregnancy¹. Infertility affects approximately 10-15% of couples². In the past, the female partner was the primary focus of attention but now it is recognized that sole male factor is responsible in 30% cases of infertility, out of which, 15% is related to genital tract infection. Tuberculosis of the male genital tract is a well known cause of male infertility³. It can involve prostate, seminal vesicles, epididymis and testis, leading to oligo-azoospermia and infertility. The conventional tests for the diagnosis of Tuberculosis during the early stages have poor sensitivity and specificity. Recently, the Polymerase chain reaction (PCR) technique has shown high sensitivity and specificity for the diagnosis of Genital Tuberculosis⁴. We use PCR technique at our

institute for detection of mycobacterial DNA in semen sample for early diagnosis of male genital tuberculosis. Early treatment with anti tubercular therapy can lead to restoration of sperm counts, resulting in increased chances of conception in their female counterpart.

Case Series

This case series includes seven couples who diagnosed with male genital tuberculosis as a cause of infertility. These cases were diagnosed during the period of January 2013 to December 2013 while evaluating infertile couple for cause of infertility. All other possible causes of infertility were excluded by relevant clinical and laboratory examinations in all 7 couples. All baseline investigations were done to rule out female factor as a cause of infertility.

All these cases were subjected to detailed clinical history, physical examination, relevant investigations including semen analysis at the time of evaluation. The semen specimen was collected by masturbation after abstinence of 2-3 days, directly into a clean container in a private room within the laboratory. The semen sample was examined within an hour after collection. Diagnosis of male genital tuberculosis was established by detection of mycobacterium by bactec culture or mycobacterial DNA by PCR technique.

Table 1 shows demographic, Clinical and important laboratory profile of all seven cases.

Table 1 shows that all cases except case 1 and case 6 had total sperm counts less than 15 million/ml taken as significant as per lower reference limits according to WHO 2010 Guidelines⁵. Case 5 and case 7 were azoospermic on semen analysis. Cases 1, 2, 4 and 6 were diagnosed to have genital tuberculosis by MTB PCR but showed no growth on bactec AFB culture.

Table 1: Demographic, Clinical and laboratory profile of cases with genital tuberculosis

	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7
Age (Years)	26	32	27	35	29	30	36
Religion	Hindu	Hindu	Christian	Hindu	Muslim	Hindu	Muslim
Literacy	Literate	Literate	Literate	Literate	Literate	Literate	Illiterate
Socioeconomic status	Middle	lower	upper	Middle	Lower	Middle	Lower
Married life (yrs)	2	4	2	12	7	6	8
Type of infertility	1 ^o	1 ^o	1 ^o	2 ^o	2 ^o	1 ^o	1 ^o
Past H/O tuberculosis	Absent	Absent	Present at 6 yr age	Absent	Absent	Absent	Absent
Chest X-ray Findings	Suggestive of TB	NAD	Evidence of Healed TB lesion	NAD	Suggestive of TB	NAD	NAD
ESR(mm/ 1st hr)	28	12	40	18	34	22	56
Tuberculin test	Positive	Negative	Positive	Negative	Positive	Negative	Negative
Semen analysis							
Volume	2 ml	2.8 ml	2.5 ml	3 ml	2.2 ml	1.8 ml	2.5 ml
Total sperm count(million/ml)	36	14	10	2	0	55	0
Active motile sperm (%)	28	39	46	5	-	50	-
Normal sperm morphology (%)	65	62	59	38	-	65	-
Semen Bactec AFB Culture	Negative	Negative	Positive	negative	Positive	Negative	Positive
MTB PCR	Positive	Positive	Positive	Positive	Positive	Positive	Positive

All the cases received anti tubercular treatment as per DOTS protocol. A repeat semen analysis was done on completion of treatment to find out any changes in result of semen analysis. Table 2 compares results of semen analysis before and after antitubercular treatment.

As shown in table 2, there was quantitative as well as qualitative improvement in semen parameters of all the seven cases after completion of antitubercular therapy.

These cases were followed for a period of 6 months after completion of antitubercular treatment to document conception in these couples. The female counterpart of case 6, case 2 and case 1 conceived during last month of antitubercular therapy, 1 month after completion of antitubercular therapy and 4 month after completion of antitubercular therapy respectively.

Discussion

Infertility is a health problem with very definite psychological, physiological and social implications. In the past, the female partner was the primary focus of attention but now it is recognised that sole male factor is responsible in 30% of cases, out of which, 15% is related to genital tract infection. Tubercular infection of the male genital tract can result in infertility. Genital tuberculosis is usually caused by the reactivation or

dissemination of organisms from the primary focus. Infertility may be the first presentation of genitourinary tuberculosis and patients may have no recollection of any other symptoms⁶.

There are a variety of assays available for the diagnosis of TB including semen examination, semen culture studies and molecular diagnostic methods. ZN smear for AFB, although virtually diagnostic, are usually positive in less than 10% cases of extra-pulmonary tuberculosis. Culture for *Mycobacterium tuberculosis* takes long time and is also often negative. The sensitivity is as low as 40% in extrapulmonary samples even with the newer rapid culture techniques such as Bactec radiometric culture. These traditional bacteriological methods are either slow or their sensitivity is quite low, especially with clinical samples that contain small number of organisms⁷. PCR can detect fewer than 10 organisms in clinical specimen compared with 10,000 necessary for smear positivity and 100-1000 to grow on culture. It is an important feature because genital TB is paucibacillary, hence it is difficult to grow on culture and to see in smear. Our case series also highlights the superiority of PCR method over AFB culture as only three cases were positive by bactec AFB culture method while MTB PCR was positive in seven cases.

Table 2: Comparison of semen analysis findings before and after antitubercular therapy

Semen analysis	Case 1		Case 2		Case 3		Case 4		Case 5		Case 6		Case 7	
	Before ATT	After ATT												
Volume (ml)	2	2.2	2.8	2.6	2.5	2.9	3	2.4	2.2	3	1.8	2.5	2.5	2.3
Total sperm count (million/ml)	36	82	14	44	10	26	2	32	0	12	55	86	0	22
Active motile sperm (%)	28	46	39	44	46	52	5	28	-	22	50	59	-	32
Normal sperm morphology (%)	65	68	62	64	59	60	38	56	-	46	65	67	-	38

The tubercular infection can involve any part of the genital tract including the testis, epididymis, vas deferens, seminal vesicles, prostate and the ejaculatory ducts. Tuberculosis of genital tract has a detrimental effect on sperm quality by reducing concentration and motility, and possibly affecting the number of morphological normal spermatozoa⁸. Azoospermia is evident in advanced stages of disease. In our case series three cases were oligospermic while another two were azoospermic.

Early treatment with anti tubercular treatment can leads to restoration of sperm counts. Rupin S shah et al also concluded in their study that epididymal inflammation due to tuberculosis can be completely resolved by antitubercular therapy, resulting in reversal of azoospermia⁹. Our case series also confirms that sperm count can be improved after antitubercular therapy in males with genital tuberculosis, resulting in increased chances of conception in their female counterpart.

As we know that infertility may be the first presentation of genital tract tuberculosis, therefore, a high index of suspicion is essential while evaluating infertile couples in communities where tuberculosis is a prevalent disease. MTB PCR should be used for early and accurate diagnosis of genital tuberculosis. Accurate diagnosis of early genital tract tuberculosis and timely antitubercular therapy can provide an excellent chance to infertile couples for spontaneous conception.

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