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Original Research Article

Female Genital Tuberculosis (FGTB) Cause of Infertility: A Hospital Based Clinical Study

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Abstract

Background: Female genital tuberculosis (FGTB) is an important cause of morbidity and infertility worldwide. Mycobacterium tuberculosis most commonly spreads to the genital tract from a focus elsewhere in the body and affects the bilateral fallopian tubes and/or endometrium. Many patients with FGTB have indolent disease and are only diagnosed after evaluation for infertility. Women may present with menstrual irregularities, lower abdominal or pelvic pain, or abnormal vaginal discharge. Given the low sensitivity of diagnostic tests, various composite reference standards are used to diagnose FGTB, including some combination of endoscopic findings, microbiological or molecular testing, and histopathological evidence in gynecological specimens.

Methods: The present hospital based clinical study was conducted on 100 patients in the department of Obstetrics and Gynaecology, Darbhanga Medical College and Hospital, Laheriasarai, Bihar from September 2024 to October 2025.

Results: Out of 100 cases of infertile patients 18 cases had female genital tuberculosis (FGTB). Fallopian tube was the most common site of involvement in FGTB in 9(50%) cases and second most common is endometrium. In FGTB 13 cases had primary infertility while 5 cases had secondary infertility.

Conclusion: In our study we found that FGTB commonly presents as primary infertility. Menstrual problem were not a common presentation. Fallopian tube was the common site of involvement in FGTB.

Keywords: Infertility, female genital tuberculosis.

Introduction

Female genital tuberculosis (FGTB) is a notable yet under-recognised cause of infertility, particularly in regions where tuberculosis (TB) is endemic. [1]

FGTB affects primarily women of reproductive age which can spread to the reproductive organs such as the fallopian tubes, endometrium, and ovaries. This can lead to severe reproductive complications including tubal blockage, pelvic adhesions, and endometrial damage, all of which significantly impact fertility. Due to the typically asymptomatic or low-symptom presentation of FGTB, diagnosing the condition early remains a substantial challenge.[1,2]

Accurate prevalence data for FGTB is difficult to obtain, as cases are often underreported or missed due to the disease's silent nature and variability in symptom presentation.

Current estimates of FGTB incidence vary, ranging from 1% in the United States and Scandinavian countries to as high as 48.5% among infertile women in northern India.

These rates highlight the pressing need for more effective diagnostic strategies in high-prevalence settings. [3,4]

Standard diagnostic methods for FGTB, such as histopathology, polymerase chain reaction (PCR), and bacterial culture, often lack sufficient sensitivity and specificity when used alone, leading to potential delays in diagnosis. The use of a composite reference standard (CRS), which combines multiple diagnostic methods, may improve diagnostic accuracy and detection rates in FGTB.

CRS can include techniques like culture, GeneXpert, PCR, histology, and imaging, enhancing the reliability of diagnosis when individual tests yield inconclusive results.[5–7]

Material and Methods

The present study was conducted on 100 patients in the department of Obstetrics and Gynaecology,

Darbhanga Medical College and Hospital, Laheriasarai, Bihar from September 2024 to October 2025.

All sexually active women of reproductive age group with infertility were included in this study.

Patients of non-reproductive age group who have completed their family were excluded in this study.

Detailed history and socio-economic status was taken. General physical examination was done. Routine investigation i.e. haemogram, renal and liver function tests, ESR, TLC was carried out. Montoux test was done for diagnosis of tuberculosis and skin test was read between 48 and 72 hours after administration. Two sputum specimens were sent for detection of mycobacterium tuberculosis by ZN staining. One specimen out of two was considered smearpositive TB. Pelvic ultrasound was done to rule out uterine and adnexal pathology.

Each patient was subjected to diagnostic laparoscopy examination and a careful evaluation of fallopian tubes, ovaries, pelvic peritoneum, pouch of Douglas and peritoneal cavity. Features suggestive of genital TB were looked for by noting the presence of miliary tubercles on uterus and tubes, nodular salphingitis, caeseosalphinx, hydrosalpinx, presence of peritubal, periovarian, omental and bowel adhesions, free fluid in pouch of Douglas. Following this endometrial biopsy was done. On histopathology of endometrial curettage, the features suggestive of tuberculosis were the presence of tubercle bacilli, caseous necrosis, giant cells, epithelial cell clusters and lymphocytic infiltration.

All entries were entered in SPSS version 24. Association of each of the categorical variable was assessed with chi-square test.

Results

Out of 100 cases 18 cases had female genital tuberculosis (FGTB). In table 1 shows maximum infertile women were 31-35 years of age. In genital TB group maximum patients belongs to 26-30 years of age (44.4%) followed by 31-35 years age group (27.7%) and 16.6% were women belongs to >36 years of age. Mean age was 28.11 years in present study.

Table 1: Age wise distribution of infertile women and FGTB patients

Parameters	Age (years)	No. of cases	Percentage
Infertile patients	<20	3	3%
	21-25	17	17%
	26-30	25	25%
	31-35	45	45%
	>35	10	10%
Female Genital TB patients	<20	0	0
	21-25	2	11.1%
	26-30	8	44.4%
	31-35	5	27.7%
	>35	3	16.6%

Most common menstrual complaint in infertile group was hypomenorrhea (10%) followed by menorrhagia 5% and amenorrhoea 5%. The table 2, shows majority of women had normal menstrual function (p - 0.0001) which is significant.

Table 2: Different menstrual pattern in infertile and FGTB patients

Categories	Menstrual abnormalities	No. of cases	Percentage	p-value
Infertile patients	Normal menstruation	80	80%	0.0001
	Hypomenorrhea	10	10%	
	Menorrhagia	5	5%	
	Amenorrhea	5	5%	
Female Genital TB patients	Normal menstruation	9	50%	0.0001
	Hypomenorrhea	5	27.7%	
	Menorrhagia	3	16.6%	
	Amenorrhea	1	5.5%	

Out of 18 cases of female genital tuberculosis patient's majority of women had normal menstrual function (50%). The most common menstrual abnormality which was found in genital TB was hypomenorrhoea 5 cases (27.7%) followed by menorrhagia in 16.6% cases and amenorrhea in 5.5%. In genital tuberculosis 13 cases had primary infertility while 5 cases had secondary infertility (table 3).

Table 3: Infertility pattern in infertile and FGTB patients

Categories	Menstrual abnormalities	No. of cases	Percentage	p-value
Infertile patients	Primary infertility	74	74%	<0.0001
	Secondary infertility	26	26%	
Female Genital TB patients	Primary infertility	13	72.2%	<0.0001
	Secondary infertility	5	27.8%	

In present study we found that ovulatory dysfunction is leading cause of infertility (30%) followed by tubal factor (28%), endometriosis in 24% cases, and uterine factor in 14% of the cases (p - 0.08) (table 4).

Table 4: Different etiologies of female infertility

Etiology	No. of patients	Percentage
Ovulatory dysfunction (anovulation)	30	30%
Tubal factor	28	28%
Uterine factor	14	14%
* congenital	2	2%
* acquired	12	12%
Pelvic factors (endometriosis)	24	24%
Unexplained	3	3%

In the patients of genital tuberculosis fallopian tubes are the most common of the site of involvement. In our study out of 18 cases in 9 cases fallopian tubes are the most common site followed by 6 cases in which fallopian tubes along with uterus and ovaries were also involved (p - 0.0001) which was significant (table 5).

Table 5: Pattern of involvement in FGTB

Genital tract involved	No. of cases	Percentage
Fallopiantube	9	50%
Fallopiantube+ ovary	1	
Fallopiantube+ovary+ uterus	6	
Ovary	-	
Uterus	2	11%
Cervix	-	
Vagina	-	-

Discussion

The present was conducted to assess the prevalence of tuberculosis in infertile women and to determine the pattern of involvement, clinical spectrum and impact on fertility in women with tuberculosis. Similar study was done by Umoh AV and Gabiel MA on 114 infertile women and genital tuberculosis was found in 19 infertile women (16.7%).[8]

Singh et al done their study on 140 infertile patients, out of these 58 patients (41.4%) had genital TB. Genital TB being paucibacillary and asymptomatic, it is often underdiagnosed and it being a major cause of female tubal cause of infertility.[9,10] The reported prevalence varies widely world over due to differences in population group studied, sensitivity and specificity of test used for its diagnosis and timing of sample with respect to menstrual cycle. In our study maximum infertile women were in 31-35 years age group (45%) and mean age of infertile women was 29.85 yrs.

Hull et al conducted their study on 472 infertile women. The mean age of infertile women in their study was 28 years which was similar to our study.[11] Philippov OS et al done their study on 333 infertile couple. The mean age of infertile women was 24 years in their study.[12] In our study mean age of infertile women with genital TB is 28.11 years which was comparable to our study. Maximum age group of infertile women with TB is 26-30 years (44.4%).

In the present study women having genital tuberculosis was predominantly having primary infertility (72.22%) and a small proportion (27.77%) had secondary infertility. The findings suggested the fact that genital TB could interfere with normal reproductive process in women of reproductive age group. Similar study was done in Iran by OS Phillipov, showed 85% of infertile women with genital TB had primary infertility and 15% of women had secondary infertility.[12]

In our study maximum patients of infertility had marital life less than 5 years (36%) and mean age of marital life was 6.16 years. Paul et al studied 113 infertile women; the mean age of marital life in infertile women was 5.6 years in their study.[13] In present study majority of the women had normal menstrual function (80%) while 10% of the patients had hypomenorrhea followed by menorrhagia (5%) and amenorrhea (5%). Paul et al observed abnormal

menstruation was present in 14.2 % cases. Philippov et al studied 333 infertile couples in which irregular menstruation was present in 20% of primary infertility and 10% of secondary infertility patients.[6,7] Santosh et al studied 110 cases of female genital tuberculosis over a period of 15 years in which menstruation disturbances were found in 27 patients (24.5%).[14] The most common findings were vaginal bleeding (18%), amenorrhea (5%), and vaginal discharge (4%).

In our study ovulation dysfunction was the leading cause of infertility followed by tubal factor (28%). Endometriosis was found in 24% of the genital TB patients, uterine factor was present in 14% of the cases. Hull et al studied 472 infertile women in which ovulatory failure was present in 21% patients, tubal factor in 14% patients, endometrium involvement in 6% patients and 28% patients had unexplained cause.

Philippov et al studied 333 infertile couple which shows that the most frequent causes for female infertility were disturbances in tubal patency and pelvic adhesions in 23.6%.

In 25.3% had chronic cervicitis,18.3% had mycoplasma and adhesions due to postoperative complications in 5.4%.[6] In our study fallopian tube was involved in 88.5% cases. When tuberculosis affects the female genital tract, the fallopian tube is primarily affected and endometrium is secondary involved. Singh et al 3 studied 58 case of genital TB and found 13 patients had bilateral fimbrial block, 21 had corneal block, 8 had hydrosalphinx, 4 had tubo-ovarian mass, 8 had tubercular endometritis 3.

Conclusion

In our study we found that female genital tuberculosis is the most common cause of infertility in infertile women. Genital tuberculosis commonly presents as primary infertility. Ovarian dysfunction was found to be most common cause of infertility. Menstrual problem were not a common presentation. Fallopian tube was the common site of involvement in genital tuberculosis.

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