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Research Article

Spectrum of Clinicopathological Findings in Female Genital Tuberculosis at a Tertiary Care Hospital

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Abstract

Background: Female genital tuberculosis (FGTB) is an important yet often underdiagnosed cause of infertility in developing countries. The present study aimed to describe the various clinical presentations of FGTB and to evaluate the different diagnostic methods and treatment modalities. **Materials and Methods:** This retrospective study was conducted in the Departments of Obstetrics and Gynecology and Chest and Tuberculosis at FH Medical College and Hospital, Satauli, Uttar Pradesh. Medical records of patients diagnosed with genital tuberculosis over a period of one year were reviewed. Clinical presentation, diagnostic findings, and treatment details were analyzed. **Results:** Genital tuberculosis was diagnosed in 60 women during the study period. The majority of patients (40%) belonged to the 21–29 years age group. Infertility was the most common presenting complaint (50%), followed by secondary amenorrhea (36.6%). Forty patients undergoing diagnostic hysterolaparoscopy as part of infertility evaluation were found to have genital tuberculosis. Endometrial samples were obtained in all cases. CBNAAT emerged as the most valuable diagnostic tool, showing positivity in 41.7% of cases. All patients received standard anti-tubercular therapy. **Conclusion:** Female genital tuberculosis remains an underestimated condition due to its often asymptomatic course and the limited sensitivity of available diagnostic tests. Early suspicion and appropriate diagnostic evaluation are essential for timely management. Social, familial, and ethical challenges further complicate the clinical management of affected women.

Keywords: Female genital tuberculosis, Endometrium, Infertility, CBNAAT

Introduction

Tuberculosis (TB) remains a major global public health problem and one of the leading causes of mortality among communicable diseases worldwide. The global burden of TB is estimated to affect approximately 8–10 million individuals annually, with rising incidence partly attributed to the HIV pandemic and the emergence of multidrug-resistant strains [1,2]. Tuberculosis and HIV co-infection represent a significant cause of infectious

disease–related mortality, as nearly one-third of HIV-infected individuals are affected by TB [3]. Recognizing the severity of the problem, the World Health Organization (WHO) declared TB a global emergency in 1993 and introduced the Directly Observed Treatment Short-course (DOTS) strategy, targeting a 70% case detection rate and 85% treatment success rate [4].

In India, the Revised National Tuberculosis Control Programme (RNTCP), incorporating the DOTS strategy, achieved nationwide coverage, with reported case detection rates of approximately 71% and treatment success rates nearing 87%, along with a substantial reduction in TB-related mortality [5]. Despite these advances, tuberculosis continues to pose diagnostic and therapeutic challenges, particularly in its extrapulmonary forms.

Pulmonary TB (PTB) is the most common and infectious form of the disease. However, extrapulmonary tuberculosis (EPTB) accounts for a significant proportion of cases, especially among women of reproductive age. Female genital tuberculosis (FGTB) is an important form of EPTB and is typically secondary to a primary focus elsewhere in the body, most commonly the lungs. The disease spreads primarily via the hematogenous route, although lymphatic and direct spread may also occur [8,9].

FGTB most commonly affects the fallopian tubes, followed by the endometrium, ovaries, cervix, myometrium, and, rarely, the vulva and vagina. Tubal involvement often results in endosalpingitis, while direct spread from adjacent structures may cause exosalpingitis. In approximately 50% of cases, the infection extends from the fallopian tubes to the endometrium. Ovarian involvement may occur through direct or lymphatic spread. Rarely, vulvovaginal or cervical tuberculosis may result from sexual transmission from an infected partner [9].

Clinically, genital tuberculosis is frequently asymptomatic or presents with nonspecific symptoms, leading to delayed or missed diagnosis. It is widely recognized as a significant etiological factor in infertility in regions with high TB prevalence. The disease can cause tubal obstruction and dysfunction, impaired endometrial receptivity, menstrual irregularities, ovulatory dysfunction, and recurrent pregnancy loss [8].

Preoperative diagnosis of genital TB is often not established in women undergoing routine gynecological surgeries such as vaginal hysterectomy or pelvic floor repair, particularly in the absence of menstrual abnormalities. Lack of routine endometrial sampling in such cases may contribute to missed diagnoses. Furthermore, surgical procedures in women with undiagnosed genital TB may be complicated due to distorted anatomy, absence of normal surgical planes, increased adhesions, and the potential for disease flare-up [6,7]. Given its subtle presentation, significant reproductive consequences, and diagnostic challenges, early identification of FGTB is essential. The present study was undertaken to describe the various clinical presentations of female genital tuberculosis and to evaluate the different diagnostic methods employed in its detection.

Materials and Methods

This retrospective study was conducted in the Departments of Obstetrics and Gynecology and Chest and Tuberculosis at FH Medical College and Hospital, Satauli, Uttar Pradesh. The study reviewed medical records of women diagnosed with female genital tuberculosis (FGTB) over a period of one year.

Data were collected from hospital records of all confirmed cases of genital tuberculosis. Variables analyzed included age, presenting symptoms, clinical findings, diagnostic investigations, and histopathological reports. All patients underwent evaluation by a chest physician for assessment and clearance.

Ethical approval for the study was obtained from the Institutional Ethics Committee prior to data collection. The collected data

were coded and entered into a Microsoft Excel spreadsheet. Statistical analysis was performed using SPSS version 28. The results were expressed in terms of frequencies and percentages and presented in tabular form.

Results

A total of 60 women diagnosed with genital tuberculosis were included in the study. Only seven patients (11.7%) had a past history of pulmonary tuberculosis. Genital tuberculosis predominantly affected adolescents and young women. In the present study, 6 women (10%) were below 20 years of age, 24 women (40%) were between 20–29 years, 18 women (30%) were in the 30–39 years age group, 7 women (11.7%) were between 40–49 years, and 5 women (8.3%) were above 50 years of age. The highest incidence was observed in the 20–29 years age group.

Table 1: Age Distribution of Study Participants (n = 60)

Age	Number (n=60)	Percentage (%)
<20	6	10
21-30	24	40
31-40	18	30
41-50	7	11.7
>50	5	8.3
Total	60	100

Table 2: Clinical Presentations of Patients (n = 60)

Symptoms	Number	Percentage
Asymptomatic	7	11.7
Primary Infertility	30	50
Secondary Infertility	8	13.3
Abdominal Pain	12	20
Secondary Amenorrhea	22	36.7
Menstrual Disturbances	18	30
Pv Dischage	2	3.3
Pruritis Vulvae	2	3.3

The most common presenting complaint was **primary infertility**, observed in 30 patients (50%). The second most common symptom was **secondary amenorrhea**, seen in 22 patients (36.7%), followed by **menstrual disturbances**, reported in 18 patients (30%).

Abdominal pain was noted in 12 patients (20%). A small proportion of patients presented with **secondary infertility** (13.3%), while 7 patients (11.7%) were asymptomatic and diagnosed incidentally during evaluation. Per vaginal discharge and pruritus vulvae were reported in 3.3% of cases each.

Table 3: Endoscopic Findings

Laparoscopic Findings	Number	Percentage
Normal	18	30
Bilateral Dye Spill Absent	15	25
Delayed Dye Spill	5	8.3

Hydrosalpinx	9	15
Granulations	2	3.3
Beaded Appearance	5	8.3
Unilateral Dye Spill	2	3.3
Adhesions	4	6.7
Pelvic Congestion	2	3.3
Hysteroscopic Findings		
Fibrosed Ostia	9	15
Intrauterine Adhesions	5	8.3
Small Uterine Cavity	3	5

On clinical examination, the most common finding was an **adnexal mass**, observed in 12 patients (20%). Ultrasonography revealed a **tubo-ovarian mass** in 20 patients (33.3%), making it the most frequent radiological finding. Out of the total 60 patients, 40 women underwent **diagnostic laparoscopy** as part of infertility evaluation. Endometrial samples were collected in these cases and sent for histopathological examination (HPE), mycobacterial culture, TB-PCR, and CBNAAT.

Laparoscopic Findings

Among the 40 patients who underwent laparoscopy:

- 18 patients (30%) had **no abnormal findings**.
- 10 patients (25%) showed **bilateral absence of dye spill** on chromopertubation, suggestive of tubal block.
- 6 patients (15%) had **hydrosalpinx**.
- 5 patients (8.3%) showed a **beaded appearance of the fallopian tubes**, suggestive of tubercular salpingitis.
- 4 patients (6.7%) had **pelvic adhesions**.
- Hysteroscopy was also performed in infertile patients during the same sitting to evaluate the uterine cavity.

Table 4: Results of Specific Diagnostic Tests on Endometrial Samples

Tests	Done In Samples	Positive Result
Histopathological Examination(Hpe)	60	5(%)
Afb Culture	60	10 (%)
Tb-Pcr	40	15(37.5%)
Cbnaat	40	25(62.5%)

Endometrial samples were obtained from all patients for further evaluation. CBNAAT showed positive results in 62.5% of patients, making it the most sensitive diagnostic modality in the present study. TB-PCR was positive in 37.5% of cases (Table 4). All patients received standard anti-tubercular therapy (ATT) as per national guidelines

Discussion

Female genital tuberculosis (FGTB) remains a significant health problem in developing countries and is an important cause of menstrual dysfunction, infertility,

tubo-ovarian masses, and chronic pelvic pain. It may also coexist with conditions such as rectovaginal fistula, malignancy, or genital prolapse [6,10]. Mycobacterium tuberculosis most commonly affects the fallopian tubes, leading to tubal damage and infertility. Although it can occur at any age, women in the reproductive age group (15–45 years) are most commonly affected [11]. In the present study, the majority of patients belonged to the 20–29 years age group, which correlates with the peak reproductive period and aligns with previous studies.

FGTB is often asymptomatic or presents with nonspecific symptoms. Infertility is the most common presentation, followed by menstrual irregularities such as oligomenorrhea, hypomenorrhea, amenorrhea, menorrhagia, dysmenorrhea, and metrorrhagia. Pelvic pain and abnormal vaginal discharge may also occur. In postmenopausal women, genital TB may mimic endometrial carcinoma, presenting with postmenopausal bleeding or pyometra [8]. In the present study, primary infertility was the most common presenting complaint, followed by secondary amenorrhea and menstrual disturbances.

Genital tuberculosis is usually secondary to a primary focus elsewhere in the body and spreads predominantly through the hematogenous route. Rarely, it may occur as a primary infection through sexual transmission from a partner with genital TB [12]. It manifests in 2–20% of patients with pulmonary tuberculosis. In developed countries, genital TB accounts for approximately 1% of infertility cases, whereas in India it contributes to nearly 18% of infertility cases [13].

The fallopian tubes are involved in 90–100% of cases, presenting with congestion, miliary tubercles, hydrosalpinx, pyosalpinx, or tubo-ovarian masses. Endometrial involvement occurs in 50–80% of cases and may lead to caseation, ulceration, and intrauterine adhesions (Asherman's syndrome). Ovarian involvement is seen in 20–30% of cases, while cervical, vaginal, and vulvar tuberculosis are relatively rare [14].

Early diagnosis is crucial to prevent irreversible fibrosis and infertility. Diagnosis requires a high index of suspicion, especially in endemic areas. Endometrial biopsy remains a valuable diagnostic tool. Histopathological evidence of granuloma with or without Langhans giant cells is suggestive of tuberculosis; however, a negative biopsy does not exclude the disease due to its paucibacillary nature [15].

Various diagnostic modalities are employed, including hysterosalpingography, laparoscopy, hysteroscopy, endometrial biopsy, PCR, and CBNAAT. Laparoscopy with directed biopsy is particularly useful for diagnosing tubercular salpingitis. HSG findings such as beaded tubes, lead-pipe appearance, or tobacco pouch appearance are characteristic of genital TB [17].

In the present study, CBNAAT demonstrated higher positivity compared to TB-PCR, highlighting its utility as a rapid and reliable diagnostic tool. The GeneXpert system, recommended by the WHO, not only detects Mycobacterium tuberculosis but also identifies rifampicin resistance.

Medical therapy with anti-tubercular drugs remains the cornerstone of treatment. Surgical intervention is rarely required and is reserved for specific indications such as large tubo-ovarian abscesses, persistent symptoms, fistula formation, or diagnostic uncertainty [18]. With modern chemotherapy regimens, the need for extensive surgical procedures has significantly reduced. Limited surgery, such as drainage of abscesses, may be performed when indicated.

Surgical management in genital TB can be challenging due to dense adhesions, distorted anatomy, and matted bowel loops, increasing the risk of complications such as hemorrhage, bowel injury, and fistula formation. Therefore, conservative management with ATT is preferred whenever possible.

Despite national TB control programs, challenges remain at both policy and clinical levels. The varied presentation, paucibacillary nature, and limitations of diagnostic modalities contribute to delayed diagnosis. A multidisciplinary approach is essential for optimal management.

Conclusion

Female genital tuberculosis is an underdiagnosed condition, primarily due to its asymptomatic presentation and the limited sensitivity of available diagnostic tests. It remains an important cause of infertility in reproductive-aged women in endemic regions. Early suspicion, appropriate diagnostic evaluation—including endometrial sampling and molecular testing such as CBNAAT—and timely initiation of anti-tubercular therapy are crucial to prevent long-term sequelae, particularly infertility. Sustained public health efforts, continued research for more sensitive diagnostic modalities, development of improved therapeutic strategies, and strong implementation of national TB control programs are essential to reduce the burden of disease. Social, familial, and ethical challenges further complicate management and require sensitive clinical handling.

Conflicts of Interest: None

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