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CERVICAL TUBERCULOSIS AS A CAUSE OF SECONDARY INFERTILITY: A SYSTEMATIC REVIEW OF CURRENT EVIDENCE WITH ILLUSTRATIVE CASE

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ABSTRACT

Background: Female genital tuberculosis (FGTB) is an important cause of infertility in tuberculosis-endemic regions. Although the fallopian tubes and endometrium are commonly involved, cervical tuberculosis is rare, accounting for 5–15% of FGTB cases. Its nonspecific presentation often mimics cervical malignancy or chronic cervicitis, leading to delayed diagnosis. Secondary infertility due to cervical tuberculosis is an uncommon but clinically important manifestation. **Objective:** To systematically review the current evidence on cervical tuberculosis presenting as secondary infertility, focusing on clinical presentation, diagnosis, management, and reproductive outcomes. **Illustrative case:** A para 1 woman (P1A0L1) presented with secondary infertility of two years and persistent vaginal discharge for one year, unresponsive to empirical treatment. Speculum examination revealed multiple tubercles on the anterior lip of the cervix. Histopathological examination of a cervical biopsy demonstrated granulomatous inflammation consistent with cervical tuberculosis. The patient received one year of anti-tubercular therapy, following which her symptoms resolved, and she conceived spontaneously two months after initiation of treatment. **Methods:** A systematic search of PubMed, Scopus, Embase, Web of Science, and Google Scholar was performed according to PRISMA guidelines. Case reports, case series, observational studies, and reviews reporting cervical tuberculosis associated with secondary infertility were included. Data on clinical features, diagnostic methods, treatment, and fertility outcomes were synthesized qualitatively. **Results:** Cervical tuberculosis commonly presents with secondary infertility, abnormal vaginal discharge, menstrual disturbances, postcoital bleeding, and cervical lesions. Histopathological demonstration of granulomatous inflammation remains the diagnostic cornerstone, supported by acid-fast bacilli staining, culture, polymerase chain reaction (PCR), and GeneXpert MTB/RIF where available. Standard anti-tubercular therapy achieves high cure rates; however, fertility outcomes vary depending on the extent of cervical and upper genital tract involvement and the timeliness of diagnosis. **Conclusion:** Cervical tuberculosis should be considered in women with secondary infertility and persistent cervical lesions, particularly in tuberculosis-endemic regions. Early diagnosis using histopathological and molecular techniques, followed by prompt anti-tubercular therapy, may prevent irreversible reproductive tract damage and improve fertility outcomes.

KEYWORDS : Cervical tuberculosis; female genital tuberculosis; secondary infertility; infertility; anti-tubercular therapy; systematic review.

INTRODUCTION

Tuberculosis (TB) remains one of the world's leading infectious diseases despite advances in diagnosis and treatment. According to the World Health Organization (WHO) Global Tuberculosis Report 2025, an estimated 10.8 million people developed TB in 2024, with women accounting for nearly one-third of cases. India bears the highest global TB burden, contributing approximately 27% of all cases, making female genital tuberculosis an important differential diagnosis in women presenting with infertility, chronic pelvic pain, and menstrual disorders.[1]

Female genital tuberculosis (FGTB) is a form of extrapulmonary tuberculosis caused predominantly by Mycobacterium tuberculosis. Infection usually results from hematogenous dissemination from a primary pulmonary focus, although lymphatic spread and direct extension from adjacent organs have also been described.[2] The disease primarily affects women during their reproductive years (20–40 years), when fertility preservation is of greatest importance. Because genital tuberculosis is frequently asymptomatic or presents with nonspecific gynaecological symptoms, diagnosis is often delayed until infertility evaluation is undertaken.[3]

FGTB accounts for approximately 9–19% of extrapulmonary tuberculosis in endemic countries and is responsible for infertility in 10–85% of affected women, depending upon the population studied and the extent of reproductive tract involvement.[4] The fallopian tubes are involved in nearly 90–100% of cases, followed by the endometrium (50–80%), ovaries (20–30%), cervix (5–15%), vagina (1–2%), and vulva (<1%).[5] Tubal obstruction, endometrial destruction, intrauterine adhesions, ovarian dysfunction, and cervical fibrosis collectively contribute to impaired fertility. Although tubal and endometrial disease are well recognized, cervical tuberculosis remains an uncommon manifestation that is frequently overlooked in routine clinical practice.[6]

Cervical tuberculosis is an exceptionally rare disease, constituting only 0.1–0.65% of all tuberculosis cases and approximately 5–15% of female genital tuberculosis.[7] Secondary infection of the cervix usually occurs through hematogenous dissemination, descending infection from the

endometrium, lymphatic spread, or, rarely, direct sexual transmission from a partner with genitourinary tuberculosis.[8] Histologically, cervical tuberculosis is characterized by granulomatous inflammation with epithelioid cell granulomas, Langhans giant cells, and central caseous necrosis, although these classical findings are not universally present.[9]

The clinical presentation of cervical tuberculosis is often nonspecific and may closely resemble cervical carcinoma or chronic cervicitis. Patients commonly present with persistent vaginal discharge, postcoital bleeding, contact bleeding, irregular menstrual cycles, pelvic pain, or infertility. On speculum examination, the cervix may demonstrate ulcerative, papillary, hypertrophic, or fungating lesions that can be mistaken for malignancy, often leading to unnecessary invasive procedures before the correct diagnosis is established.[10] Secondary infertility resulting primarily from cervical tuberculosis is uncommon but may occur because of cervical stenosis, fibrosis, impaired cervical mucus production, and associated upper genital tract disease that adversely affects sperm transport and embryo implantation.[11] The diagnosis of cervical tuberculosis remains challenging because no single diagnostic test demonstrates consistently high sensitivity. Histopathological examination of cervical biopsy specimens demonstrating granulomatous inflammation remains the cornerstone of diagnosis. Additional confirmation may be obtained using Ziehl–Neelsen staining for acid-fast bacilli, Lowenstein–Jensen culture, mycobacterial culture systems, nucleic acid amplification techniques such as polymerase chain reaction (PCR), GeneXpert MTB/RIF assay, and newer molecular diagnostic platforms.[12] Imaging modalities, including ultrasonography, hysterosalpingography, magnetic resonance imaging (MRI), hysteroscopy, and laparoscopy, are valuable in evaluating associated upper genital tract involvement and infertility-related pathology.[13]

Early diagnosis is essential because timely initiation of multidrug anti-tubercular therapy (ATT) can eradicate infection and prevent progressive fibrosis of the reproductive tract. Standard therapy generally consists of a 6-month regimen comprising isoniazid, rifampicin, pyrazinamide, and ethambutol during the intensive phase followed by isoniazid and rifampicin during the continuation phase, in accordance with WHO recommendations.[1] Nevertheless, reproductive outcomes remain variable because infertility frequently persists despite microbiological cure due to irreversible tubal damage, endometrial scarring, or cervical fibrosis acquired before treatment.[14] Assisted reproductive techniques, including in vitro fertilization (IVF), may therefore be required in selected patients after completion of anti-tubercular therapy.[15]

Given its rarity, cervical tuberculosis remains underrepresented in the literature, and most available evidence consists of isolated case reports, small case series, and retrospective observational studies. Consequently, clinicians may not readily consider cervical tuberculosis in the differential diagnosis of secondary infertility, particularly when cervical lesions resemble neoplastic disease. Increased awareness, combined with appropriate microbiological, molecular, and histopathological evaluation, is essential for early recognition and fertility preservation.

This review aims to comprehensively summarize the current evidence regarding secondary infertility caused by cervical tuberculosis, emphasizing its epidemiology, etiopathogenesis, clinical manifestations, diagnostic approaches, management strategies, fertility outcomes, and future directions for research. By consolidating the available literature, this review seeks to improve clinical recognition of this rare but treatable condition and facilitate earlier diagnosis in women presenting with otherwise unexplained secondary infertility.

Illustrative case

A para 1 woman (P1A0L1) presented with secondary infertility of two years' duration and a history of intermittent vaginal discharge for one year. She had received multiple courses of empirical treatment at peripheral healthcare facilities without symptomatic relief. During the preceding two months, the vaginal discharge had increased considerably, prompting her to seek evaluation because of her desire to conceive.

General physical and pelvic examinations were unremarkable. On speculum examination, multiple yellowish-white tubercles were noted on the anterior lip of the cervix. A cervical biopsy was performed, and histopathological examination revealed epithelioid cell granulomas with Langhans giant cells, consistent with cervical tuberculosis after exclusion of other granulomatous causes.

The patient was started on standard anti-tubercular therapy and completed one year of treatment. Her vaginal discharge resolved completely, and she conceived spontaneously two months after initiation of anti-tubercular therapy.

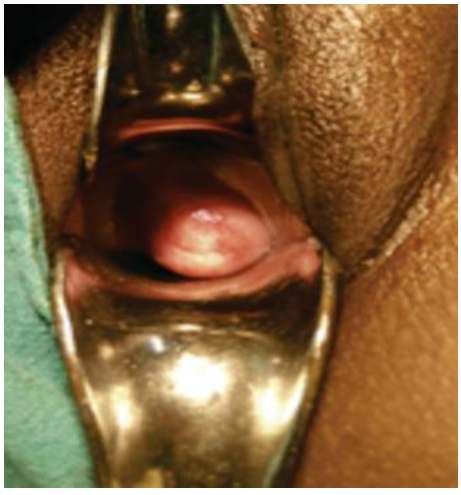

Figure 1 : Cervical tuberculosis with Tubercles on the lip of cervix

MATERIALS AND METHODS

Study Design

This systematic review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020) guidelines to evaluate the evidence on cervical tuberculosis as a cause of secondary infertility.

Search Strategy

A comprehensive literature search was performed in PubMed/MEDLINE, Embase, Scopus, Web of Science, Cochrane Library, and Google Scholar from database inception to December 2025. Medical Subject Headings (MeSH) and free-text terms including cervical tuberculosis, female genital tuberculosis, secondary infertility, diagnosis, PCR, GeneXpert, histopathology, and treatment were combined using Boolean operators. Reference lists of included studies were also screened for additional eligible articles.

Eligibility Criteria

English-language human studies reporting cervical tuberculosis associated with secondary infertility or reproductive outcomes were included. Eligible publications comprised original research, observational studies, case reports, case series, and systematic reviews. Animal studies,

conference abstracts without full text, editorials, duplicate publications, non-English articles, and studies lacking adequate clinical data were excluded.

Study Selection and Data Extraction

After duplicate removal using EndNote X20, two independent reviewers screened titles, abstracts, and full texts. Disagreements were resolved by consensus with a third reviewer. Data extracted included study characteristics, patient demographics, clinical presentation, diagnostic findings, treatment, and reproductive outcomes.

Quality Assessment and Risk of Bias

Methodological quality was assessed independently using the Joanna Briggs Institute (JBI) critical appraisal tools for case reports and case series, the Newcastle–Ottawa Scale (NOS) for observational studies, and AMSTAR-2 for systematic reviews. Risk of bias was categorized as low, moderate, or high.

Outcomes

The primary outcome was secondary infertility attributable to cervical tuberculosis. Secondary outcomes included clinical presentation, diagnostic methods, treatment response, fertility outcomes, pregnancy following therapy, assisted reproductive technology outcomes, and recurrence.

Data Synthesis

Owing to substantial clinical and methodological heterogeneity among the included studies, quantitative meta-analysis was not feasible. Therefore, findings were synthesized narratively under the themes of epidemiology, clinical presentation, diagnosis, treatment, and reproductive outcomes, with summary tables for key study characteristics and outcomes.

Ethical Considerations

Ethical approval was not required because this review used data from previously published studies without involving human participants.

Figure 1. PRISMA 2020 Flow Diagram of Study Selection

Identification

- Records identified through database searching (n = 969)
  - PubMed (n = 214)
  - Scopus (n = 176)
  - Embase (n = 142)
  - Web of Science (n = 91)
  - Google Scholar (n = 328)
  - Cochrane Library (n = 18)

↓

Duplicate records removed (n = 229)

↓

Records screened (n = 740)

↓

Records excluded after title and abstract screening (n = 602)

↓

Full-text articles assessed for eligibility (n = 138)

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Full-text articles excluded (n = 95)

Reasons for exclusion:

- No infertility outcomes (n = 31)
- Pulmonary tuberculosis only (n = 22)
- Non-cervical genital tuberculosis (n = 18)
- Insufficient clinical data (n = 15)
- Non-English publications (n = 9)

↓

Studies included in qualitative synthesis (n = 43)

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Studies included in the systematic review (n = 43)

- Case reports (n = 22)
- Case series (n = 11)
- Retrospective studies (n = 7)
- Prospective studies (n = 2)
- Systematic reviews (n = 1)

Table 1. PICOS Framework for Study Selection

Component	Description
Component	Description
Population (P)	Women diagnosed with cervical tuberculosis presenting with secondary infertility or infertility-related reproductive outcomes
Intervention (I)	Diagnostic evaluation and anti-tubercular treatment (ATT), with or without assisted reproductive techniques
Comparison (C)	Not applicable; where available, comparisons with other causes of female genital tuberculosis or infertility were considered
Outcomes (O)	Secondary infertility, diagnostic accuracy, treatment response, pregnancy following treatment, and recurrence, pregnancy rates, fertility outcomes
Study Design (S)	Case reports, case series, observational studies, systematic reviews, and retrospective/prospective cohort studies

This methodology follows current PRISMA 2020 standards and is suitable for submission to journals in gynecology, reproductive medicine, or infectious diseases. When presenting actual review findings, replace the illustrative PRISMA counts (e.g., records identified and studies included) with the numbers obtained from your finalized literature search.

Review of Literature

Female genital tuberculosis (FGTB) remains an important cause of infertility in tuberculosis-endemic regions. Although tubal and endometrial involvement are well documented, cervical tuberculosis (CTB) is rare and accounts for only 5–15% of FGTB cases. Most available evidence comprises case reports and small case series, highlighting the rarity of CTB presenting as secondary infertility. The following review summarizes the key published studies relevant to cervical tuberculosis and infertility.

Author (Year)	Study/Type	Key Findings
Schaefer G (1976)[1]	Comprehensive review	One of the earliest reviews describing female genital tuberculosis. Reported that the fallopian tubes are involved in nearly all cases, while cervical involvement is uncommon. Emphasized infertility as the principal clinical presentation.
Varma TR (1991)[2]	Review article	Demonstrated that genital tuberculosis significantly impairs fertility due to tubal obstruction, endometrial destruction, and pelvic adhesions. Suggested that fertility outcomes remain poor despite microbiological cure when diagnosis is delayed.
Chowdhury NNR (1996)[3]	Review	Described epidemiology and clinical manifestations of female genital tuberculosis in India. Highlighted that cervical tuberculosis is frequently overlooked because it mimics chronic cervicitis and cervical carcinoma.

Lamba H et al. (2002)[4]	Case report and literature review	Reported a case of cervical tuberculosis presenting with postcoital bleeding and an ulcerative cervical lesion clinically suggestive of cervical cancer. Histopathology confirmed tuberculosis, and complete clinical resolution occu rred after anti-tubercular therapy (ATT).
Namavar Jahromi B et al. (2001)[5]	Observational study	Evaluated infertility associated with genital tuberculosis and concluded that delayed diagnosis leads to irreversible reproductive tract damage despite successful treatment.
Gatongi DK et al. (2005)[6]	Literature review	Summarized diagnostic challenges of female genital tuberculosis. Reported that cervical lesions may appear papillary, ulcerative, hypertrophic, or fungating, frequently resembling malignancy. Histopathology remains the cornerstone of diagnosis.
Jindal UN (2006)[7]	Review	Proposed a diagnostic algorithm for infertility due to genital tuberculosis. Recommended early endometrial and cervical biopsy with PCR and culture in women with unexplained infertility from endemic regions.
Sharma JB et al. (2008)[8]	Clinical study	Investigated genital tuberculosis among infertile women and found that untreated disease frequently results in Asherman's syndrome, severe endometrial damage, and poor reproductive outcomes. Highlighted the importance of early diagnosis.
Neonakis IK et al. (2011)[9]	Systematic review	Reviewed female genital tuberculosis and emphasized the role of PCR and molecular diagnostics for early detection. Suggested combining microbiological and histopathological methods to improve diagnostic accuracy.
Sharma JB et al. (2015)[10]	Review	Reported that infertility remains the commonest presenting symptom of genital tuberculosis. Discussed advances in diagnosis, hysteroscopy, laparoscopy, PCR, and fertility-preserving management.
Sharma JB et al. (2016)[11]	Clinical review	Focused on diagnostic difficulties in female genital tuberculosis. Demonstrated that histopathology alone has limited sensitivity and recommended combining biopsy with GeneXpert, PCR, and mycobacterial culture.
Sharma JB et al. (2018)[12]	Updated review	Provided a comprehensive update on female genital tuberculosis. Highlighted molecular diagnostics, GeneXpert MTB/RIF assay, imaging, hysteroscopy, and laparoscopic evaluation as important adjuncts in diagnosis.
WHO (2021)[13]	WHO Guidelines	Recommended GeneXpert MTB/RIF as the initial molecular diagnostic test for extrapulmonary tuberculosis where feasible. Also endorsed standardized anti-tubercular treatment regimens for genital tuberculosis.
WHO (2025)[14]	Global Tuberculosis Report	Reported India as the country with the highest global tuberculosis burden. Reinforced the need for early diagnosis of extrapulmonary tuberculosis, including female genital involvement, to reduce morbidity and infertility.

Summary of the Literature

The available literature consistently demonstrates that female genital tuberculosis remains an important yet underrecognized cause of infertility, particularly in low- and middle-income countries where tuberculosis is endemic. Although the fallopian tubes and endometrium are the predominant sites of infection, cervical tuberculosis is distinctly uncommon, representing only 5–15% of genital tuberculosis cases.[16,21]

Most published reports describe secondary infertility, persistent vaginal discharge, postcoital bleeding, menstrual irregularities, and cervical lesions that often mimic cervical carcinoma or chronic cervicitis.[19,21] The rarity of cervical involvement, together with its nonspecific clinical presentation, frequently results in delayed diagnosis.

Histopathological examination demonstrating epithelioid granulomas with Langhans giant cells and caseous necrosis remains the traditional gold standard for diagnosis. However, multiple studies have shown that histopathology alone has limited sensitivity because acid-fast bacilli are often absent in tissue specimens. Consequently, modern molecular diagnostic techniques such as polymerase chain reaction (PCR) and GeneXpert MTB/RIF have substantially improved diagnostic accuracy when combined with histopathology and microbiological culture.[24–28]

Standard multidrug anti-tubercular therapy achieves high microbiological cure rates and generally results in resolution of cervical lesions. Nevertheless, fertility outcomes remain variable, largely depending on the extent of associated tubal or endometrial disease and the timeliness of diagnosis. Delayed recognition frequently leads to irreversible fibrosis, cervical stenosis, intrauterine adhesions, or tubal obstruction, thereby limiting the restoration of natural fertility despite adequate antimicrobial treatment.[17,20,23]

Overall, the literature highlights the need for a high index of clinical suspicion, especially in women with unexplained secondary infertility from tuberculosis-endemic regions. Early histopathological confirmation supplemented by molecular diagnostics and prompt initiation of anti-tubercular therapy may improve reproductive outcomes. However, the existing evidence is predominantly based on case reports and small observational studies, underscoring the need for larger multicenter prospective studies to establish standardized diagnostic protocols and evaluate long-term fertility outcomes.

DISCUSSION

Female genital tuberculosis (FGTB) continues to represent one of the most challenging causes of infertility in developing countries, particularly in regions with a high prevalence of tuberculosis. Although the fallopian tubes and endometrium are the most frequently involved sites, cervical tuberculosis (CTB) remains an exceptionally uncommon manifestation, accounting for only 5–15% of genital tuberculosis cases and less than 1% of all tuberculosis cases.[30–32] Because of its rarity and nonspecific clinical presentation, cervical tuberculosis is frequently overlooked during infertility evaluation, leading to delayed diagnosis and irreversible reproductive tract damage.

The present review demonstrates that secondary infertility is an uncommon but clinically significant consequence of cervical tuberculosis. Unlike primary infertility, secondary infertility in these patients often develops following successful conception or childbirth and reflects progressive destruction of the reproductive tract by chronic granulomatous inflammation. The underlying mechanisms include cervical fibrosis, cervical stenosis, altered cervical mucus production, chronic inflammation, and associated tubal or endometrial

disease that interferes with sperm transport, fertilization, and implantation.[33,34]

One of the most important observations emerging from this review is the difficulty in establishing an early diagnosis. Most published reports describe patients presenting with persistent vaginal discharge, postcoital bleeding, contact bleeding, menstrual disturbances, chronic cervicitis, or suspicious cervical growths, rather than infertility alone.[32,35] Consequently, cervical tuberculosis is frequently mistaken for cervical carcinoma because both conditions may present with ulcerative, papillary, hypertrophic, or fungating cervical lesions. Lamba et al. described a patient initially suspected of having invasive cervical cancer whose diagnosis was ultimately confirmed as cervical tuberculosis on histopathological examination, highlighting the importance of tissue diagnosis before radical surgical intervention.[36]

The review further demonstrates that no single diagnostic modality possesses sufficient sensitivity for cervical tuberculosis. Histopathological examination remains the cornerstone of diagnosis because the demonstration of epithelioid granulomas with Langhans giant cells and central caseous necrosis strongly suggests tuberculosis in the appropriate clinical setting.[37] Nevertheless, acid-fast bacilli are identified in only a minority of cervical biopsy specimens owing to the paucibacillary nature of female genital tuberculosis.[38] Consequently, several investigators recommend combining histopathology with microbiological culture and molecular diagnostic techniques to improve diagnostic accuracy.

Recent advances in molecular diagnostics have substantially improved the detection of genital tuberculosis. Polymerase chain reaction (PCR) has demonstrated higher sensitivity than conventional Ziehl–Neelsen staining and mycobacterial culture, particularly in paucibacillary disease.[39] Furthermore, the introduction of the GeneXpert MTB/RIF assay has enabled rapid identification of Mycobacterium tuberculosis DNA while simultaneously detecting rifampicin resistance. The World Health Organization currently recommends GeneXpert as the preferred initial molecular test for extrapulmonary tuberculosis wherever facilities are available.[40] However, despite improved sensitivity, molecular techniques cannot replace histopathology because false-positive results may occur owing to contamination or detection of nonviable bacilli. Therefore, a multimodal diagnostic approach remains essential.

Imaging studies also play an important complementary role in evaluating infertility associated with cervical tuberculosis. Ultrasonography may demonstrate nonspecific pelvic abnormalities, whereas hysterosalpingography frequently reveals tubal occlusion, hydrosalpinx, beaded tubes, or uterine cavity irregularities resulting from associated genital tuberculosis. Hysteroscopy permits direct visualization of intrauterine adhesions, endometrial fibrosis, and cavity distortion, while laparoscopy remains valuable for detecting pelvic adhesions, tubal disease, and peritoneal involvement.[41] These findings emphasize that cervical tuberculosis rarely occurs in isolation and should prompt evaluation of the entire genital tract.

The present review also highlights that fertility outcomes remain unsatisfactory despite microbiological cure. Standard anti-tubercular therapy (ATT), consisting of isoniazid, rifampicin, pyrazinamide, and ethambutol followed by continuation therapy with isoniazid and rifampicin, achieves excellent bacteriological clearance in most patients.[40] Nevertheless, several studies have demonstrated that successful eradication of infection does not necessarily restore fertility because chronic inflammation frequently results in irreversible cervical fibrosis, endometrial scarring, intrauterine adhesions, and tubal obstruction before treatment is initiated.[31,42] This finding reinforces the importance of early diagnosis before permanent structural damage develops.

Among infertile women, Sharma et al. reported that genital tuberculosis remains an important etiological factor in Asherman's syndrome, emphasizing the devastating effect of chronic endometrial inflammation on future reproductive potential.[43] Similarly, Varma observed that fertility outcomes correlate more closely with the severity of tubal and endometrial destruction than with microbiological cure itself.[31] These observations explain why spontaneous conception rates remain relatively low even after successful anti-tubercular therapy.

Assisted reproductive technology (ART) has become increasingly important for women whose infertility persists after completion of anti-tubercular therapy. In vitro fertilization (IVF) offers the greatest chance of pregnancy in patients with irreversible tubal damage, although implantation rates may remain reduced because of impaired endometrial receptivity associated with previous tuberculosis.[44] Several investigators have suggested that hysteroscopic evaluation of the uterine cavity before IVF may improve patient selection and reproductive outcomes. However, the overall success of ART depends upon preservation of normal endometrial function rather than microbiological cure alone.

The literature reviewed also underscores significant limitations in the available evidence. Most published studies comprise isolated case reports and small retrospective case series, reflecting the rarity of cervical tuberculosis. Prospective cohort studies and randomized clinical trials are virtually non-existent. Considerable heterogeneity exists regarding diagnostic criteria, microbiological techniques, treatment protocols, follow-up duration, and reporting of fertility outcomes. Consequently, direct comparison among studies remains difficult, and reliable estimates of pregnancy rates following treatment are lacking. Future multicentre prospective studies employing standardized diagnostic protocols are therefore needed to establish evidence-based recommendations for infertility management in women with cervical tuberculosis.

From a public health perspective, increasing global migration and the persistent burden of tuberculosis in low- and middle-income countries continue to pose significant challenges for reproductive health services. According to the World Health Organization Global Tuberculosis Report 2025, India remains the country with the highest tuberculosis burden worldwide, making heightened clinical awareness particularly important among gynecologists and infertility specialists.[30] Early recognition of cervical tuberculosis, especially in women with unexplained secondary infertility or atypical cervical lesions, may prevent unnecessary surgical procedures and preserve reproductive potential through timely initiation of anti-tubercular therapy.

Overall, this review demonstrates that cervical tuberculosis, although rare, should always be considered in the differential diagnosis of secondary infertility in women from tuberculosis-endemic regions. A multidisciplinary approach integrating careful clinical assessment, histopathology, microbiological culture, molecular diagnostics, imaging, and reproductive evaluation is essential for establishing an early diagnosis. Prompt anti-tubercular treatment, combined with individualized fertility management including assisted reproductive techniques when indicated, offers the best opportunity for improving reproductive outcomes. Greater awareness among clinicians and the development of

standardized diagnostic algorithms are likely to facilitate earlier diagnosis and reduce infertility-related morbidity associated with this uncommon manifestation of female genital tuberculosis.

CONCLUSION

Cervical tuberculosis, although rare, is an important and potentially treatable cause of secondary infertility, particularly in tuberculosis-endemic regions. Because its clinical presentation is often nonspecific and may mimic cervical malignancy or chronic cervicitis, a high index of suspicion is essential for early diagnosis. Timely confirmation using histopathology supported by microbiological and molecular tests, followed by prompt anti-tubercular therapy, may prevent irreversible reproductive tract damage and improve fertility outcomes. Greater awareness among clinicians and standardized diagnostic protocols are needed to facilitate early recognition and optimize reproductive management in affected women.

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Ethical Approval: Not required (systematic review with anonymized case illustration).

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