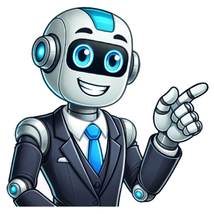
I'm not a bot



Female genital tuberculosis (FGTB) is an important cause of significant morbidity, short- and long-term sequelae especially infertility whose incidence varies from 3 to 16 % cases in India. Mycobacterium tuberculosis is the etiological agent for tuberculosis. The fallopian tubes are involved in 90–100 % cases, endometrium is involved in 50–80 % cases, ovaries are involved in 20–30 % cases, and cervix is involved in 5–15 % cases of genital TB. Tuberculosis of vagina and vulva is rare (1–2 %). The diagnosis is made by detection of acid-fast bacilli on microscopy or culture on endometrial biopsy or on histopathological detection of epithelioid granuloma on biopsy. Polymerase chain reaction may be false positive and alone is not sufficient to make the diagnosis. Laparoscopy and hysteroscopy can diagnose genital tuberculosis by various findings. Treatment is by giving daily therapy of rifampicin (R), isoniazid (H), pyrazinamide (Z) and ethambutol (E) for 2 months followed by daily 4 month therapy of rifampicin (R) and isoniazid (H). Alternatively 2 months intensive phase of RHZE can be daily followed by alternate day combination phase (RH) of 4 months. Three weekly dosing throughout therapy (RHZE thrice weekly for 2 months followed by RH thrice weekly for 4 months) can be given as directly observed treatment short-course. Surgery is rarely required only as drainage of abscesses. There is a role of in vitro fertilization and embryo transfer in women whose fallopian tubes are damaged but endometrium is healthy. Surrogacy or adoption is needed for women whose endometrium is also damaged.

Keywords: Female genital tuberculosis, Endometrial biopsy, Acid-fast bacilli, Polymerase chain reaction, Laparoscopy, Hysteroscopy

Tuberculosis continues to be a major health problem throughout the world affecting about 9.4 million people annually with about two million deaths [1, 2]. Over 95 % of new TB cases and deaths occur in developing countries with India and China together accounting for 40 % of the world's TB burden. Co-infection with human immunodeficiency virus (HIV), more liberal immigration from high risk to low risk areas due to globalization has been responsible for increased incidence all over the world. Multidrug resistant (MDR) and extreme-drug resistant TB (XDR), usually caused by poor case management, are a cause of serious concern [1, 2]. World Health Organization (WHO) in a drastic step declared TB a global emergency in 1993 and promoted a new effective TB control called Directly Observed Treatment Short-course (DOTS) strategy with 70 % case detection rate and 85 % successfully treatment rates [3]. The Revised National Tuberculosis Control Programme (RNTCP) of India incorporating DOTS strategy has achieved 100 % geographical coverage with 71 % case detection rate and 87 % treatment success rate with a sevenfold decrease in death rate (from 29 to 4 %) in the year of 2010 [4]. Apart from commonest and the most infectious pulmonary TB, extra pulmonary TB (EPTB) is being increasingly encountered throughout the world [5]. Female genital TB (FGTB) is an important cause of significant morbidity, short- and long-term sequelae especially infertility [5–8]. Timely diagnosis and prompt appropriate treatment may prevent infertility and other sequelae of the disease. The incidence of FGTB varies in different countries from 1 % in infertility clinics of USA, 6.15–21.1 % in South Africa and 1–19 % in various parts of India [7, 9–13]. In infertility patients, incidence of FGTB varies from 3 to 16 % in India with higher incidence being from apex institutes like All India Institute of Medical Sciences (AIIMS), New Delhi, where prevalence of FGTB in women of infertility was 26 % and incidence of infertility in FGTB to be 42.5 %, which may be due to referral of difficult and intractable cases to this apex hospital from all over India, especially from states like Bihar where prevalence of TB is very high [8, 13]. Similarly incidence of FGTB is also very high in women seeking assisted reproduction being 24.5 % overall but as high as 48.5 % with tubal factor infertility [14]. The FGTB is present in younger age (20–40 years) as compared to premenopausal age in developed countries [6, 8–15]. It may be due to younger age at marriage and child bearing in developing countries as compared to western world [8]. There has been fivefold increase in overall incidence of TB in countries with high prevalence of HIV due to impaired immunity in them [16]. Mycobacterium tuberculosis is the etiological agent for tuberculosis. Predisposing factors for TB include factors reducing personal immunity like poverty, overcrowding with improper ventilation, inadequate access to health care, malnutrition, diabetes mellitus, smoking, alcohol and drug abuse, end stage renal disease cancer treatment hemodialysis patients and patient with HIV infection [1–3, 5–8, 16]. Genital TB generally occurs secondary to pulmonary (commonest) or extra pulmonary TB like gastro-intestinal tract, kidneys, skeletal system, meninges and miliary TB [5–8] through hematogenous and lymphatic route. However, primary genital TB can rarely occur in women whose male partners have active genitourinary TB (e.g., tuberculosis epididymitis) by transmission through infected semen [5, 8]. The site of involvement in primary genital TB can be cervix, vagina or vulva [5, 8]. Direct contiguous spread from nearby abdominal organs like intestines or abdominal lymph nodes can also cause genital TB. The fallopian tubes are involved in 90–100 % cases with congestion, military tubercles, hydrosalpinx, pyosalpinx and tubo-ovarian masses [5, 8]. Endometrium is involved in 50–80 % cases with caseation and ulceration causing intrauterine adhesions (Asherman's syndrome) [17]. Ovaries are involved in 20–30 % cases with tubo-ovarian masses [5, 8]. Cervical TB may be seen in 5–15 % cases of genital TB and may masquerade cervical cancer necessitating biopsy for confirmation of diagnosis with granulomatous lesion [18]. Tuberculosis of vagina and vulva is rare (1–2 %) with a hypertrophic lesion or a nonhealing ulcer mimicking malignancy needing biopsy and histopathological examination to confirm the diagnosis. Rarely TB of the vagina can cause involvement of Bartholin's glands, vesicovaginal and rectovaginal fistula formation [19]. Peritoneal TB can be a disseminated form of TB with tubercles all over the peritoneum, intestines and omentum and may cause ascites and abdominal mass. It may masquerade as ovarian cancer as even CA 125 levels are raised in peritoneal TB with CT scan and MRI also giving similar picture and diagnosis may be made only on laparotomy done for suspected ovarian cancer [20, 21]. Ascitic fluid tapping for bio-chemical analysis (elevated adenosine deaminase level in ascitic fluid in peritoneal TB) is useful in diagnosis [22]. Laparoscopic biopsy with frozen section evaluation has also been suggested to avoid laparotomy in such cases [21, 22]. Positron emission tomography with 18 F-fluorodeoxy glucose (FDG-PET) has been successfully used for the preoperative diagnosis of peritoneal tuberculosis and tuberculous tubo-ovarian masses [23, 24]. Varying grades of pelvic and abdominal adhesions including perihepatic adhesions (Fitz-Hugh–Curtis syndrome) are common in genital and peritoneal tuberculosis [25, 26]. Rarely genital TB may be associated with other gynecological pathologies like ovarian cancer, genital prolapse and fibroid uterus [5–8]. The clinical presentation of genital TB depends upon the site of involvement of genital organs and is shown in Table 1 [5, 8, 11, 27]. Up to 11 % of women with genital TB may be asymptomatic [8, 13]. The age of presentation in 80 % of women is 20–40 years age group especially in developing countries. Infertility is the commonest presentation of genital TB due to the involvement of fallopian tubes (blocked and damaged tubes), endometrium (non-reception and damaged endometrium with Asherman's syndrome) and ovarian damage with poor ovarian reserve and volume [6–8, 17, 28]. Symptoms and signs in FGTB (A) Symptoms in genital TB [5, 6, 8, 11, 27] Asymptomatic (up to 11 %) General systemic symptoms Pyrexia with night sweats Loss of appetite Weight loss Poor general condition Menstrual dysfunction Puberty menorrhagia Menorrhagia Postmenopausal bleeding Oligomenorrhea Hypomenorrhea Amenorrhea (primary and secondary) Dysmenorrhea Infertility (primary and secondary) Abdominal lump Abdominal pain (may be flared up after HSG or D&C) Chronic pelvic pain (may be flared up after HSG or D&C) Acute abdomen (in rupture of tubo-ovarian abscess or flaring up of TB after HSG, D&C, coitus, exercise, menstruation) Abnormal vaginal discharge Unusual symptoms Vaginal or vulva ulcers Labial swelling Retention urinary Urinary incontinence Fecal incontinence (B) Signs in genital TB [5, 6, 8, 18–21] No physical sign (common) Systemic examination Fever Lymphadenopathy (in lymphnodes TB) Crepitations on chest auscultation (PTB) Other systemic signs depending on site of EPTB Abdominal examination Doughy feel of abdomen Ascites Mass abdomen (vague or definite) Vaginal examination Uterine enlargement (pyometra) Adnexal tenderness and induration Adnexal masses and tubo-ovarian mass Fullness and tenderness in pouch of Douglas Rare signs Hypertrophic lesions in cervix, vagina or vulva (may masquerade malignancy) Ulcerative lesions in cervix, vagina or vulva (may masquerade, venereal diseases or malignancy) Labial mass (Bartholin swelling) Vesicovaginal fistula Rectovaginal fistula Tubovesical fistula Tuboperitoneal fistula Tubointestinal fistula Uterocutaneous fistula The various signs of FGTB depend on the site of involvement of genital organs and are shown in Table 1 [5, 6, 8, 18–21, 28]. As genital TB may manifest in different ways with no characteristic symptoms and signs, the differential diagnosis depends upon the clinical presentation and is shown in Table 2 [5, 6, 8, 18–20]. Differential diagnosis (DD) of genital TB [5, 6, 8, 18–20] The differential diagnosis depends on the clinical presentation For women presenting with pain and adnexal mass following possibilities should be considered Acute and chronic pelvic infections Ectopic pregnancy Endometriosis Ovarian cancer Appendicitis For granulomatous lesions in the pelvis Syphilis Actinomycosis Granuloma inguinale venereum Filariasis Crohn's diseases Schistosomiasis Silicosis Brucellosis Histoplasmosis Leprosy Ulcerative or hypertrophic lesions Vaginal cyst Vulval and vaginal warts Condyloma lata Condyloma acuminata Bartholin abscess Vulval cancer Vaginal cancer Cervical cancer Being a paucibacillary disease, demonstration of mycobacterium tuberculosis is not possible in all the cases. A high index of suspicion is required. The diagnostic dilemma arises due to varied clinical presentation, diverse results on imaging and endoscopy and availability of battery of bacteriological, serological and histopathological tests which are often required to get a collective evidence of the diagnosis of genital TB [8, 11]. The diagnostic approach used is family history of TB or history of antituberculous therapy (ATT) in a close family member or a past history of TB or ATT in the patient may show recrudescence of TB in the genital region. History of HIV positivity is also important. Detailed general physical examination for any lymphadenopathy and any evidence of TB at any other site in body (bones, joints, skin, etc.), chest examination (PTB), abdominal examination (abdominal TB), examination of external genitalia (vulvar or vaginal TB), speculum examination (cervical TB), bimanual examination (endometrial or fallopian tube TB) help in the diagnosis of genital TB [5, 6, 8, 18]. All tests are not required for every single case of genital TB. The tests will depend upon the site of TB and its clinical presentation. The various tests are shown in Table 3 [29–33]. Investigations in genital TB [5–8, 15, 28–33] Blood tests Anemia, leucocytosis with lymphocytosis and raised ESR; nonspecific Serological tests like ELISA are not very sensitive and specific Moderate rise in levels of CA 125 in genital TB Mantoux (tuberculin) test and interferon gamma release assays; poor sensitivity and specificity Chest X-ray For pulmonary TB Imaging methods Ultrasonography (USG) Computerized axial tomography (CT scan) Magnetic resonance imaging (MRI) [29]: useful for tubo-ovarian masses Positron emission tomography (PET scan) [24]: tubercular tubo-ovarian masses (Fig. 1) Hysterosalpingography (HSG) [30]: Endometrial TB can cause synechiae formation, a distorted, obliterated or T-shaped cavity and venous and lymphatic intravasation Endometrial biopsy, curettage or aspirate Histopathology Demonstration of epithelioid granuloma Mycobacterial smear and culture Using Lowenstein–Jensen (LJ) medium or BACTEC 460 or mycobacteria growth inhibitor tube (MGIT) and specific gene probes can help in rapid identification and diagnosis [15] Polymerase chain reaction (PCR) Rapid (1–2 days), sensitive and specific method for detecting mycobacterial DNA (mpt 64 gene) with high pickup rate but can be false negative due to contamination or false positive as it can pick up even single mycobacterium tuberculosis and may not be able to differentiate between infection and disease [31, 32]. Hence ATT should not be started just on the basis of positive PCR unless there is some other evidence of FGTB on clinical examination or on investigations like the presence of tubercles or other stigmata of TB on laparoscopy. However, Jindal et al. [33] observed high pregnancy rate for treating infertility with positive PCR alone with ATT Endoscopic visualization of the uterine cavity in genital TB may show a normal cavity (if no endometrial TB or early stage TB) with bilateral open ostia. More often, however, the endometrium is pale looking, and the cavity is partially or completely obliterated by adhesions of varying grade (grade 1 to grade 4) often involving ostia as observed by us (Fig. 2) [34]. There may be a small shrunken cavity. In our study on hysteroscopy in genital TB, we observed increased difficulty to distend the cavity and to do the procedure and increased chances of complications like excessive bleeding, perforation and flare-up of genital TB [35]. Hence, hysteroscopy in a patient with genital TB should be done by an experienced person preferably under laparoscopic guidance to avoid false passage formation and injury to the pelvic organs. PET scan showing left tubo-ovarian mass (arrow) with increase FDG uptake in FGTB case Hysteroscopy showing grade 2 adhesions and pale endometrium in a FGTB case Laparoscopic findings showing Fitz-Hugh–Curtis syndrome in FGTB case Laparoscopic findings showing tubercles and caseous nodules (arrows) in FGTB caseA laparoscopy and dye hydrotubation (lap and dye test) is the most reliable tool to diagnose genital TB, especially for tubal, ovarian and peritoneal disease [8, 36]. The test can be combined with hysteroscopy for more information as follows [8, 34, 36]. In subacute stage, there may be congestion, edema and adhesions in pelvic organs with multiple fluid-filled pockets. There are miliary tubercles, white yellow and opaque plaques over the fallopian tubes and uterus. In chronic stage, there may be following abnormalities. Yellow small nodules on tubes (nodular salpingitis). Short and swollen tubes with agglutinated fimbriae (patchy salpingitis. Unilateral or bilateral hydrosalpinx with retort-shaped tubes due to agglutination of fimbriae. Pyosalpinx or caseosalpinx: The tube usually bilateral is distended with caseous material with ovoid white yellow distension of ampulla with poor vascularization. Caseous nodules may be seen (Fig. 4). Various types of adhesions may be present in genital TB covering genital organs with or without omentum and intestines. There is very high prevalence (48 %) of perihepatic adhesions on laparoscopy in FGTB cases (Fig. 3) [25, 26]. In a laparoscopic study on 85 women with FGTB, we observed tubercles on peritoneum (15.9 % cases), tubo-ovarian masses (26 %), caseous nodules (7.2 %), encysted ascites (8.7 %), various grades of pelvic adhesions (65.8 %), hydrosalpinx (21.7 %), pyosalpinx (2.9 %), beaded tubes (10 %), tobacco pouch appearance (2.9 %) and inability to see tubes due to adhesions (14.2 %) [36]. We also observed increased complications on laparoscopy for FGTB as compared to laparoscopy performed for non-tuberculous patients (31 vs 4 %) like inability to see pelvis (10.3 vs 1.3 %), excessive bleeding (2.3 vs 0 %), peritonitis (8 vs 1.8 %) [37]. The adhesions are typically vascular, and adhesiolysis can increase the risk of bleeding and flare-up of the disease [8, 36, 37]. The final diagnosis is made from good history taking, careful systemic and gynecological examination and judicious use of diagnostic modalities like endometrial biopsy in conjunction with imaging methods and endoscopic visualization especially with laparoscopy. Some authors have developed an algorithm for accurate diagnosis of FGTB by combining history taking, examination and investigations [11, 38]. Multiple drug therapy in adequate doses and for sufficient duration is the main stay in the treatment of TB including FGTB. In olden days before rifampicin, the antituberculous therapy (ATT) was given for 18–24 months with significant side effects and poor compliance. Short-course chemotherapy for 6–9 months has been found to be effective for medical treatment of FGTB [39]. In a study funded by Central TB Division, Ministry of Health, Govt. of India, we observed 6-month intermittent DOTS therapy to be equally effective to 9-month therapy. American Thoracic Society [40] and British Thoracic Society and NICE (National Institute of Clinical Excellence) Guidelines (2006) [41] recommend that first choice of treatment should be the 'standard recommended regimen' using a daily dosing schedule using combination tablets and does not consider DOTS necessary in management of most cases of TB in developed countries who can adhere to treatment. DOTS is favored by WHO to prevent MDR and for better results. WHO in its recent guidelines has removed category 3 and recommended daily therapy of rifampicin (R), isoniazid (H), pyrazinamide (Z) and ethambutol (E) for 2 months followed by daily 4-month therapy of rifampicin (R) and isoniazid (H). Alternatively 2 months intensive phase of RHZE can be daily followed by alternate day combination phase (RH) of 4 months. Three weekly dosing throughout therapy (2RHZE, 4HR) can be given as DOTS provided every dose is directly observed and the patient is not HIV positive or living in an HIV prevalent setting [2]. The patient is first categorized to one of the treatment categories and is then given treatment as per guidelines for national programmes by WHO (Table 4). Genital TB is classified under category 1 being seriously ill extra pulmonary disease. To ensure quality-assured drugs in adequate doses, a full 6-month course pack box is booked for an individual patient in the DOTS center with fixed drug combipacks (FDC) of isoniazid, rifampicin, pyrazinamide and ethambutol thrice a week for first 2 months (intensive phase) under direct observation followed by combination blister pack of isoniazid and rifampicin thrice a week for next 4 months (continuation phase). Category-wise treatment regimens for tuberculosis including FGTB [2, 4, 5, 8] Rarely FGTB cases can have relapse or failure categorizing them into category II (Table 4), which includes 2 months intramuscular injections of streptomycin thrice weekly along with other four drugs (SRHZE) of category I under direct supervision of DOTS center health worker for first 2 months followed by four drugs (RHZE) thrice a week for another month (intensive phase) followed by continuation phase with three drugs isoniazid (H), rifampicin (R) and ethambutol (E) thrice a week for another 5 months. Patients not opting for DOTS treatment must take daily therapy of RHZE for 2 months (intensive phase) followed by RH for 4 months (continuation phase). Convenient and economic combipacks are available in market. It is same as for pulmonary MDR with second-line drugs and is shown in Table 4 and is needed for long duration (18–24 months). The women should be counseled about the importance of taking ATT regularly and consumption of good and nutritious diet and should report in case of any side effects of the drugs. Liver function test is no longer done regularly unless there are symptoms of hepatic toxicity. Similarly pyridoxine is not routinely prescribed with ATT unless there are symptoms of peripheral neuropathy with isoniazid. Rarely hepatitis can be caused by isoniazid, rifampicin and pyrazinamide, optic neuritis by ethambutol and auditory and vestibular toxicity by streptomycin in which case the opinion of an expert should be sought for restarting the ATT in a modified form. HIV has had a disastrous impact on attempts to control as TB is a leading cause of HIV-related morbidity and mortality, while HIV is the most important factor for fuelling the TB epidemic in high HIV prevalence populations. In India, RNTCP and National AIDS Control Organization (NACO) have joined hands for better management of this dual epidemic. Possible options for antiretroviral therapy in TB patients include: Defer antiretroviral therapy until TB treatment is completed Defer antiretroviral therapy until the end of the initial phase of treatment and use ethambutol and isoniazid in the continuation phase Treat TB with a rifampicin-containing regimen and use efavirenz + 2 NRTIs (nucleoside reverse transcriptase inhibitors) Treat TB with a rifampicin-containing regimen and use 2 NRTIs and then change to a maximally suppressive HAART regimen on completion of TB treatment. The medical therapy, especially the modern short-course chemotherapy consisting of rifampicin and other drugs, is highly effective for the treatment of FGTB with rare need of surgery [8]. However, limited surgery like drainage from residual large pelvic or tubo-ovarian abscesses or pyosalpinx can be performed followed by ATT for better results as recommended by American Thoracic Society [8, 40]. There are much higher chances of complications during surgery in women with genital TB in hysteroscopy, laparoscopy, vaginal hysterectomy and laparotomy [35, 37, 42, 43]. There is excessive hemorrhage and nonavailability of surgical planes at time of laparotomy with higher risks of injury to the bowel and other pelvic and abdominal organs. In a case of abdomino-pelvic TB, bowel loops may be matted together with no plane between them and uterus and adnexa may be buried underneath the plastic adhesions and bowel loops and are inapproachable. Even trying to perform a diagnostic laparoscopy or laparotomy in such cases can cause injury to bowel necessitating a very difficult laparotomy and resection of injured bowel. It is better to take biopsies from the representative areas and close the abdomen without pelvic clearance in cases of laparotomy done for suspected pelvic tumors but found to be tubercular at laparotomy followed by full medical treatment. Sometimes even after a full 6-month course of ATT, women with genital TB with infertility do not conceive when laparoscopy and hysteroscopy may be repeated to see any remaining disease. Outcome for fertility in FGTB is only good when ATT is started in early disease. However, cases of advanced TB with extensive adhesions in pelvis and uterus are usually untreatable with very poor prognosis for fertility. Tuboplasty performed after ATT does not help much with chances of flare-up of the disease and risk of ectopic pregnancy, should the women conceive [10, 44]. Most women with genital TB present with infertility and have poor prognosis for fertility in spite of ATT. The conception rate is low (19.2 %) with live birth rate being still low (7 %) in Tripathy and Tripathy series [10]. Parikh et al. [12] found IVF with ET to be the only hope for some of these women whose endometrium was not damaged with pregnancy rate of 16.6 % per transfer. Jindal [11] observed IVF–ET to be most successful out of all ART modalities in genital TB patients with 17.3 % conception rate in contrast to only 4.3 % with fertility enhancing surgery. Dam et al. [45] found latent genital TB responsible for repeated IVF failure in young Indian patients in Kolkata presenting with unexplained infertility with apparently normal pelvis and non-endometrial tubal factors. If after ATT their tubes are still damaged but their endometrium is receptive (no adhesions or mild adhesions which can be hysteroscopically resected), IVF–ET is recommended [8, 46]. However, if they have endometrial TB causing damage to the endometrium with shrunken small uterine cavity with Asherman's syndrome, adoption or gestational surrogacy is advised to them [47]. There has been a renewed interest in research in TB at global level. New and improved BCG vaccines are being developed. New drugs, effective against strains that are resistant to conventional drugs and requiring a shorter treatment regimen, are being developed. Newer shorter (4–5 months) regime of ATT is being developed and studied [48]. By controlling TB, FGTB can also be kept at bay and treated early to prevent the development of short-term and long-term sequelae of this menace [8]. FGTB prevalence varies in different countries being much more common in developing countries, especially Africa and Asia, and is usually a secondary infection from lungs and other sites like abdomen. FGTB is responsible for up to 16 % cases of infertility in developing countries, while infertility is seen in up to 40–50 % cases of genital TB. Other main symptoms are menstrual dysfunction, especially oligomenorrhea, amenorrhea, chronic pelvic pain and vaginal discharge. High index of suspicion is required as many cases can be asymptomatic in early stages when it can be treated without causing significant damage to genital organs as untreated FGTB can cause permanent sterility through tubal damage and endometrial destruction (Asherman's syndrome) Diagnosis is by good history taking, thorough clinical examination and judicious use of investigations, especially endometrial sampling for AFB culture, PCR and histopathological testing. Laparoscopy and hysteroscopy may be helpful in early diagnosis and to see the severity of disease for prognostication for fertility Medical treatment using DOTS strategy under direct observation and using quality-assured drugs in appropriate dosage and for adequate time is the main stay of treatment. Prognosis for fertility is poor. However, for tubal disease in the absence of endometrial disease, ART especially IVF–ET, may give some results. In cases of endometrial disease with shrunken cavity, prognosis for fertility is very poor even with IVF ET. Surgical treatment is rarely required and should only be done in exceptional circumstances and should be in the form of limited surgery like laparoscopy, hysteroscopy and drainage of abscess as surgery in genital and peritoneal TB can be difficult and hazardous. Treatment of TB in HIV-positive woman is same as in HIV-negative woman in consultation with experts in the field.

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Crucial computed tomography and magnetic resonance imaging findings of fallopian tubal tuberculosis for diagnosis: a retrospective study of 26 cases.

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Genital tuberculosis is a rare form of tuberculosis that affects the genital organs. It can affect both men and women and may cause pain, swelling, and ulcers in the genital area. It is also possible to develop a discharge from the vagina or penis. Genital TB can spread through skin-to-skin contact with an infected person or sexual intercourse. It usually occurs in people who have weakened immune systems, such as those who are HIV positive. In some cases, genital TB has been misdiagnosed as PID (Pelvic Inflammatory Disease) due to overlapping symptoms. The bacteria can spread from the genitals or anus to the mouth, fingers or other body parts during sexual intercourse. Or someone who has genital TB may pass it on to others through contact with their mucous membranes — for example, by having oral sex with a partner who has the condition. Male genital TB symptoms usually present as a slowly developing lesion on the penis or scrotum, which may become ulcerated and painful if left untreated. In rare instances, genital TB can spread to other body parts such as the liver or lungs; this may result in life-threatening illnesses. Symptoms of Genital Tuberculosis Genital tuberculosis symptoms can vary depending on your infection type and location. You may have a discharge from your penis, vagina, or anus if you have a bacterial infection. This discharge may be clear or bloody and may smell bad. You might also feel pain when urinating or during sexual intercourse. Genital tuberculosis can cause swelling and redness of the skin around your genitals and pain in that area. If there are large numbers of germs in your bloodstream (bacteremia), you might experience fever and chills, night sweats, weight loss, fatigue and muscle aches. You might get a genital ulcer, a firm, indurated lesion with irregular borders and an erythematous base. The ulcer may be single or multiple, ranging from 0.5 cm to several centimetres in diameter. Ulcers are usually painless unless they become infected with bacteria or fungi. They tend to heal slowly over several weeks without treatment but may take months to heal if left untreated entirely. You might have a low-grade fever, with a temperature between 37°C-38°C (99°F-100°F) lasting more than 24 hours with no other identifiable cause such as infection or inflammation. This often occurs when multiple ulcers are present. Some women with genital TB may also suffer from endometriosis, as the infection can lead to chronic inflammation and scarring in the uterus. Genital Tuberculosis and Infertility Genital tuberculosis is a serious condition that may lead to female infertility. It may affect the reproductive organs, including the fallopian tubes and endometrium, often causing blockages, adhesions, and ovarian dysfunction. Many women struggling with infertility may have undiagnosed genital TB, making it a major concern in regions where TB is common, like India. How Genital Tuberculosis Affects Fertility Genital TB interferes with reproductive health in multiple ways: Immune system issues that disrupt normal reproductive function Changes in growth factors and hormones affecting fertility Endometrial damage that makes implantation difficult Reduced ovarian reserve, leading to fewer healthy eggs Women with genital TB may also be at increased risk of miscarriage due to the compromised condition of the uterus. Causes of Genital Tuberculosis The bacteria Mycobacterium tuberculosis causes genital TB.It can infect the urogenital tract (the urinary tract and reproductive organs) through direct contact with an infected person or by inhaling infectious droplets from an infected person's coughs or sneezes. The bacteria may also spread to your lungs if you have a weakened immune system due to another illness, such as HIV/AIDS. If left untreated, this infection can lead to a lung disease that may become active TB in some people. Genital TB may be caused by one of two forms of TB: Extrapulmonary TB — Extrapulmonary TB refers to TB that occurs outside the lungs but in another organ system, such as the kidney or lymph nodes. Extrapulmonary TB can affect any organ system in the body, including the genitourinary system. Miliary TB — Miliary TB refers to hard nodules that form within an organ or tissue due to infection with Mycobacterium tuberculosis bacteria (MTB). Miliary TB may also occur in other body areas, such as skeletal muscle and lymph nodes. Genital organs are prone to get infected with TB if they are already infected with another sexually transmitted disease like syphilis or gonorrhea. In addition, people with weakened immune systems due to HIV/AIDS or taking medications such as steroids can also be susceptible to TB infections in the genital tract. Types of Genital Tuberculosis in Women The types of genital tuberculosis can be classified based on the site of involvement: Tuberculous Salpingitis (Fallopian Tube TB): This type of TB affects the fallopian tubes, which are essential for transporting eggs to the uterus. It can cause blocked fallopian tubes due to fluid buildup, pus formation, or lumps in the pelvis. Endometrial Tuberculosis (Uterus TB): When TB spreads to the uterus, it can damage the lining, leading to scarring and complications like Asherman's syndrome. This can cause irregular periods, pain, and problems with implantation, making it harder to sustain a pregnancy. Ovarian Tuberculosis: TB in the ovaries often appears alongside fallopian tube infection and can form lumps, leading to pelvic pain. Since the ovaries release eggs for fertilisation, any damage may disrupt ovulation and reduce fertility. Cervical Tuberculosis (Cervix TB): This form of TB affects the cervix, sometimes causing unusual vaginal discharge, pain, or sores. Vulval and Vaginal Tuberculosis (External Genital TB): TB can rarely affect the outer genital areas, causing swelling, lumps, or ulcer-like sores. Treatment of Genital Tuberculosis Treatment for genital tuberculosis can be challenging due to the severity of the symptoms and difficulty in diagnosing the disease early on. This condition must not be confused with other types of infections or sexually transmitted diseases (STDs). In most cases, genital TB treatment involves a combination of antibiotics and surgical removal of infected tissue. Surgery may be necessary to prevent the further spread of infection into other parts of your body, such as your bladder or kidneys. Genital tuberculosis treatment involves taking four to six months of medication. The drugs used may include: Isoniazid (INH) or rifampin (RIF) for two months, followed by INH for another two months. RIF may cause side effects like nausea and vomiting, but it's safe to use during pregnancy. Pyrazinamide (PZA) for up to one month, followed by ethambutol (EMB) for up to one month. EMB can cause liver damage in some people if they take it with alcohol or certain medications, so be sure to tell your doctor if you're pregnant or breastfeeding before starting treatment with this drug. The drugs are taken for two weeks, followed by two weeks without treatment. This cycle is repeated until the course is complete. People diagnosed with genital tuberculosis should be advised to stop having sex until they're no longer contagious and have finished treatment. They should also avoid having sex while they have any symptoms or signs of an STD since it could spread to others while they are ill. Genital TB and IVF Treatment In vitro fertilisation (IVF) can be a hopeful option for women whose fertility has been affected by genital TB. When the fallopian tubes or endometrium are damaged, IVF bypasses natural conception barriers by fertilising eggs outside the body and implanting embryos directly into the uterus. If the uterus is still healthy and the ovaries are functional, IVF can significantly improve pregnancy chances. Many women with genital TB-related infertility have had successful pregnancies through this method. However, there are some important challenges and risks involved: Extent of Damage: IVF success depends on how much genital TB has affected the reproductive organs. If the endometrium is severely scarred, implantation may be difficult. Risk of TB Reactivation: Women with a history of genital TB need thorough screening to ensure the infection is fully treated before starting IVF. Pregnancy Complications: There may be higher risks during pregnancy, such as poor placental function or complications affecting maternal and baby health. What Complications Can Genital TB Cause? Genital TB can lead to some serious issues: Infertility: Both men and women can have trouble getting pregnant because of damage to their reproductive organs. Period problems: Women might have irregular periods or no periods at all. Ectopic pregnancies: If the fallopian tubes are blocked, the baby might start growing in the wrong place, which can be dangerous. How Can You Prevent Genital TB? There are a few things you can do to lower your risk of getting genital TB: Safe sex: Using condoms can help prevent the spread of genital TB through sexual contact. BCG vaccine: In countries with a high burden of TB, such as India, the Bacillus Calmette-Guérin (BCG) vaccine is administered as a preventive measure. While it may not prevent all forms of TB, it is effective in reducing severe cases. Early treatment: If you have TB in your lungs, getting treated right away can stop it from spreading to your reproductive organs. Good hygiene practices: Keeping the genital area clean helps prevent bacteria from entering the body and lowers the risk of infections, including TB. Regular washing and proper care are simple yet effective ways to maintain hygiene. Prompt Treatment of Pulmonary TB: Since genital TB often spreads from other TB infections in the body, treating any TB symptoms early can prevent complications. Maintain overall health: A strong immune system is your best defence. Eating well, staying active, and managing stress can help your body fight infections more effectively. Genital TB is a highly contagious condition, but it can be successfully treated with antibiotics administered by a healthcare provider.It is recommended that Individuals believed to have genital TB symptoms be tested for the disease. If you have a confirmed diagnosis, practising safe sex and following your treatment plan will help you avoid infecting others.If you suspect you have developed genital TB symptoms, you should consult a doctor at the earliest. Visit the nearest Birla Fertility & IVF Centre or book an appointment.~ Dr. Prachi Benara Genital tuberculosis is a secondary type of infection that stems from primary tuberculosis. Tuberculosis occurs due to the presence of a specific bacterium in the lungs. When this spreads to the other organs like kidneys, pelvic areas, and finally, to the genitals – you get genital tuberculosis. This condition has been known to cause infertility and difficulty conceiving when fully developed. Female genital tuberculosis is a prevalent condition in developing countries. What Is Genital Tuberculosis? Female genital tuberculosis is caused by the agent Mycobacterium tuberculosis. Many patients of genital tuberculosis present with atypical symptoms, which are similar to some gynaecological conditions. The condition is known to cause menstrual irregularities, lower abdominal pain, chronic pelvic pain, and infertility. In vaginal tuberculosis, the bacterium mainly targets the fallopian tubes. TB spreads from the lungs to the pelvis and genital regions and shows low-grade symptoms. It's a chronic medical condition that also affects the endometrial lining, ovary, and cervix and leads to infertility. What makes TB in the uterus challenging to treat is its increasing resistance to drugs. Genital TB isn't detected directly but emerges when a woman undergoes medical diagnostic tests only to find out she's become infertile. How Does Genital TB Spread? Genital tuberculosis primarily spreads from the lungs or other organs. This transmission typically occurs through the bloodstream or lymphatic system, and in some cases, it can directly spread from nearby organs such as the bowel or lymph nodes. It's worth noting that there is a possibility of sexual transmission when a male partner has active genitourinary tuberculosis, and infected semen may play a role in this mode of transmission. How fast tuberculosis of the female genital tract spreads depends on whether the bacterium remains active or latent. Latent TB cases could later become active and start spreading, which could happen in any period of 10 to 20 years. Where active TB that becomes genital TB is concerned, it spreads if the victim comes in sexual contact with the infected person. Additionally, if you spend long enough time with the infected person and breathe in the cough they let out, the virus could enter your lungs and infect you. However, brief contact with an infected person with no talking or sharing of things will not make you the target. Causes of Genital Tuberculosis The main cause of genital tuberculosis is regular tuberculosis. This ends up spreading to the ovaries and uterus, which leads to scarring and damage to the fallopian tubes. When left untreated, it advances into later stages, and infertility becomes a reality, after which that cannot be reversed, making conception impossible. Other causes of genital tuberculosis include having a low immunity coming into contact for a long period of time with infected persons, and breathing in the bacterium. Early Symptoms of Genital TB The early ovarian tuberculosis symptoms go undetected or unnoticed since they are difficult to pinpoint. However, watch out for these signs and do a thorough investigation if you've got a nagging suspicion: Pain in the abdomen and pelvis Pain or bleeding after intercourse Primary infertility, tubal infertility, or being unable to conceive on your first try Abnormal vaginal discharge or bleeding Lack of periods Irregular menstrual cycles In males, genital TB symptoms include irritation, pain in the groin/testicles, pain while urinating, and inflammation Systemic symptoms of genital TB include weight loss, fatigue, and low-grade fever If any of your family or extended family members have a medical history of genital TB, get yourself medically evaluated to see if you're infected for early treatment or prevention. Diagnosis of Genital Tuberculosis Your doctor may order the following diagnostic tests for evaluating and staging your genital tuberculosis: Tuberculin Skin Exam – This method involves inserting antigens (TB protein) into your inner forearm. If your skin has already been exposed to TB, it will react by creating a reddish bump in 2 to 3 days. However, this skin exam doesn't tell you how long you've had TB or if the type is latent or active. It simply detects its presence, and that's it. Hysteroscopy – This diagnosis method involves inserting a thin tube into your uterus to diagnose if you have any signs of abnormal bleeding in the uterine tube. Hysteroscopy is categorized into operative hysteroscopy and diagnostic hysteroscopy. The former is used to correct any abnormalities found during diagnosis, thus eliminating the requirement for consecutive surgeries. The conditions this procedure corrects are adhesions or bands of scar tissue (tubal scarring) forming in the uterus (which are known to cause infertility), polyp and fibroid growths, and removing some of the uterine linings to prevent abnormal bleeding. Hysteroscopy can also help you determine if you've had any defects or malformations in the uterus since birth. Laparoscopy – This is the least invasive procedure out of the options listed above. A surgeon makes tiny incisions on your abdomen to peer into your organs and examine them. A camera scans the images and transmits them over the monitor. The procedure is used to find out and determine the cause of pelvic pain, and biopsy samples are also collected in the process. Cystoscopy – This procedure is used to diagnose genital TB in males. A thin tube is inserted into the urethra to examine the insides of the bladder. Doctors order this exam if males experience urinary problems. Ultrasound scans of the pelvic region – High-frequency sound waves are used to scan the insides of your organs, including the pelvic and genital regions. These do not cause pain and image your affected areas in real time. Although ultrasound scans are used to detect the movement and condition of the fetus in pregnancies, they are also used in the diagnosis of genital TB. A lab analysis of your menstrual blood by collecting a sample Complete blood count test Chest radiographs PCR Test for TB Uterus, which takes a few hours and involves reproducing RNA or DNA sections for analysis Cervical smear tests and endometrial curettage diagnostics Complications of Genital TB Complications involved with genital TB include damage to the fallopian tubes, scarring, and structural deformities in the uterus and genital organs. These lead to infertility which means women became unable to conceive, despite treatment with anti-TB medicines. Other complications include tubal malfunctioning, ectopic pregnancies, poor health of the embryo and alterations in the endometrial markers which are a factor for proper embryonic implantation. Treatment & Management of Genital TB Genital tuberculosis is treated the same way as other types of tuberculosis. Anti-TB medicines are prescribed to the patient, which runs from six to eight months. The symptoms won't appear like before once treatment starts because the antibiotics kill the bacterium present in the affected regions. Patients get administered anti-TB medicines for up to 8 months, sometimes going up to a year, depending on the severity of the condition. After this treatment, whether or not the fallopian tubes get repaired influences the outcome of pregnancies. In some cases, surgery may be recommended to repair the tubes, while other resorts include Intracytoplasmic Sperm Injections (ICSI) and IVF procedures. Death is a fatal consequence of genital TB when left untreated. How to Prevent Genital TB Infection? You can prevent getting a genital TB infection by taking note of the following tips: Avoid sexual intercourse with partners who have tuberculosis infections. Practice safe sex and hygiene, and always wear female condoms, plus use contraceptives just to be safe. Keep your immunity strong by eating healthy and making sure you get plenty of fruits and vegetables in your meals. Avoid processed foods and eat clean, basically, because it influences the chances of catching infections indirectly when you're exposed to the outdoor environment. If you are in the early stages of genital TB or TB, don't hesitate to get treated. Consult a doctor and start taking anti-TB medications before the condition progresses. Start taking a BCG vaccine early on, preferably from the age of 14. Genital Tuberculosis and Infertility "Can genital TB affect fertility?" – Yes. Genital tuberculosis leads to infertility, and most women find out they have this condition later when they get medically evaluated to uncover details about their infertility. The best way to prevent getting infertile via genital TB is to get screened every year and stay away from sources of infection. Women should take the BCG vaccine since it's mandatory for prevention, and it should start from a young age. For sexual partners who have any form of TB, they should get clinically treated and ask the doctor for advice on safe sex practices. Can I Conceive After Genital TB Treatment? Yes, you can. There have been cases recorded where severe genital TB conditions were treated all year round with anti-TB medicines. IVF rounds were administered, and embryos from the female patient were frozen for later use. The patient eventually went on to become pregnant and gave birth to a healthy baby with decent weight gain. However, whether you conceive or not after genital TB will depend on how your fallopian tubes and endometrial lining heal. In some cases, anti-TB medicines may not work well, and the doses or rounds have to be increased. Other factors like your lifestyle and nutritional diet also influence how you recover post-treatment. It is important to continue with annual follow-ups even if the chances of relapse are low. Not all hope is lost when you are diagnosed with genital TB. You have to be patient and give your genital organs enough time to heal. Sometimes this may require anti-TB therapy for a few months to a year. If you become infertile and your condition doesn't improve post-treatment, you'll have to look into other medical options. We recommend going for a second medical opinion to evaluate how it goes. If you have a weak immune system, then your doctor might prescribe you a series of antibiotics before you undergo the listed diagnostic tests. You will also have to keep urine samples aside and should rest after the procedures.

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