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Review Article

FEMALE GENITAL TRACT TUBERCULOSIS: A REVIEW

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A R T I C L E I N F O

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A B S T R A C T

Tuberculosis is a disease of considerable public health importance and has high prevalence in India. Due to high prevalence of pulmonary and extrapulmonary tuberculosis, genital tuberculosis is also common in the country. Female genital tuberculosis assumes importance in view of its varied presentations in patients and its considerable adverse impact on female fertility. The current review article discusses female genital tuberculosis in all its aspects with regard to incidence, pathophysiology, clinical manifestation and medical and surgical management.

INTRODUCTION

Tuberculosis is a disease of immense public health importance. India has highest incidence of tuberculosis all over the world. Tuberculosis can be pulmonary or extra pulmonary. This disease can occur in any part of the body, can be aymptomatic and can reoccur. Genital tuberculosis is common in communities where pulmonary and extragenital tuberculosis are common. The first case of genital tuberculosis was described by Morgagni in 1744 when he conducted postmortem examination of a woman who died of tuberculosis and found the uterus and tubes filled with caseous material.(1) There is a decline in incidence of tuberculosis since the onset of 20th century and a 5% annual decrease in incidence of tuberculosis has been documented by Center for Disease Control and Prevention, but a relative rise since 1985 is reported apparently due to associated Human Immunodeficiency Virus infection. Genital TB affects about 12% of patients with pulmonary tuberculosis (2) and represents 15–20% of extrapulmonary tuberculosis.(3) It mimicks various gynaecological diseases and may be asymptomatic, and, thus requires high index of suspicion for early diagnosis. Most of the cases are diagnosed while evaluating for infertility. Multidrug chemotherapy with isoniazid, rifampicin, ethambutol, and pyrazinamide is required for the treatment of the condition with surgical intervention in more advances cases.

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More research is required to determine the changing trends in the prevalence and more appropriate methods for diagnosis of the disease.

Data Identification

The Cochrane Library, Medline, Pubmed, Google Scholar and Scorpus electronic databases were searched for systematic reviews and Randomised controlled trials (RCT). The search was restricted to articles from 1995 to 2019. The databases were searched using the relevant MeSH terms, including all subheadings, and this was combined with a keyword search. Search words included 'genital tuberculosis', 'female genital tuberculosis', 'imaging in genital tuberculosis', 'diagnosis and treatment of genital tuberculosis'.

Epidemiology

About 10 million cases of tuberculosis have been estimated in 2017. Of these 90% were adults (aged ≥15 years), 9% were people living with HIV (72% in Africa) and two thirds were in eight countries: India (27%), China (9%), Indonesia (8%), the Philippines (6%), Pakistan (5%), Nigeria (4%), Bangladesh (4%) and South Africa (3%). The exact incidence of genital tuberculosis in females is difficult to estimate in view of varied manifestation of the disease and symptomatology common to various other genital diseases in females. It is estimated that around 11% patients with the disease do not have symptoms and are accidentally discovered.(4) The incidence varies with socioeconomic and public health conditions and is similar to that of abdominal and pulmonary tuberculosis. Studies in India in female patients with infertility have shown an incidence of

genital tuberculosis to the tune of 3-17%(5). Some teaching institutes in India have even higher incidence in view of these being referral centres with complicated cases. Incidence of tuberculosis in patients with tubal factor infertility is reported to be as high as 48.5%.(6) According to a survey conducted by Indian Council of Medical Research, the prevalence of female genital tuberculosis has increased from 19% in 2011 to 30% in 2015. Genital tuberculosis is more prevalent in younger age groups (20 – 40 years) in view of lower age of marriage and childbearing in the developing countries where tuberculosis is common. Comparing the incidence all over the world, the incidence is 0.07% in the United States, 1% in Finland,4.2% in Saudi Arabia, 5.6% in Scotland, 0.69% in Australia and 19% in India.(7-12) These estimates have been made on the basis of surgically obtained specimens, endometrial biopsies, and postmortem examinations.

Etiopathogenesis

Primary genital tuberculosis is a rare disease. Genital tuberculosis usually occurs secondary to a primary focus elsewhere in the body like lung, gastrointestinal tract, or bone or is a part of a generalized military process. The spread to the genital organs may be hematogenous, lymphatic or by direct contiguity to a focus in the gut or peritoneum. If the bacilli are not eradicated, there is a lifetime risk of reactivation especially in conditions where the T- helper cell immune responses are attenuated. The primary focus may heal and the genital lesion may lie dormant for years altogether, only to get reactivated at a later date.

Hematogenous spread – Once a pulmonary infection occurs, within a few hours, the bacilli spread through the bloodstream to various organs of the body. In the genital tract, the fallopian tube forms the most favourable place for the tubercle bacilli to lodge and the initial lesions are found in the mucosa. Usually there is a bilateral involvement and and subsequent involvement of other genital organs and the peritoneum.

Lymphatic spread – This is a relatively less common mode of dissemination and is usually seen in population where intake of unpasteurized milk is practiced. It is caused by bovine bacilli which infect the intestine through the intake of unpasteurized milk. According to Gavaller *et al*, 33% cases of female genital tuberculosis due to bovine bacilli were reported in an area of Hungary and the dissemination was apparently through lymphatics.(13)

Direct spread - Direct extension to the genital tract organs from tuberculous abdominal viscera, such as the bladder, rectum, appendix, and intestines can occur and this spread is along the peritoneal surface.

Tuberculosis of cervix, and vulva might be sexually transmitted and usually present as ulcerative lesions. Pelvic tuberculosis exists as tubercular lympadenitis of either the pelvic or the mesenteric lymph nodes. It doesnot involve the genital tract. Sometimes there may be tubercles all over the peritoneal surface and the serosal surface of pelvic and abdominal organs without involving the mucosa. Apparently, pelvic tuberculosis is a distinct entity from genital tuberculosis.

Fallopian tubes are most commonly involved structures in genital tuberculosis (90-100%) followed by endometrium(50-60%), ovaries(20-30%), cervix (5-15%) and vulva and vagina (1%)(12) . Usually, both the fallopian tubes are simultaneously involved. Initially, the submucosal part of the ampulla of the tube is involved. This is called the stage of interstitial salpingitis. This infection then spreads medially and towards the mucosa. Thus the muscle and mucosa are involved and get destroyed in the process leading to fibrosis and thickening of the tubes which is segmental at times. The fimbria become everted and the abdominal ostia remains patent, the distal part of the tube classically looking like a tobacco pouch. In cases where the abdominal ostium gets occluded the caseous material from the tubercles collect in the lumen of the tube forming a tuberculous pyosalpinx. Later this infection spreads outwards causing perisalpingitis and exudation and causes adhesion formation with surrounding structures forming tubo-ovarian masses. There might be associated tubercular peritonitis. Salpingitis isthmica nodosa is the nodular thickening of the tube due to proliferation of tubal epithelium within the hypertrophied myosalpinx, radiologically seen as a small diverticulum. It is seen in cases of genital tuberculosis where there is nodular involvement of the tube. Externally, the tube may look normal. Tubercular salpingitis may be exudative type or productive adhesive type. Exudative type is the more acute phase of the disease where a large pyosalpinx may be present but there are fewer adhesions and this phase is more amenable to surgery. The productive adhesive type is more commonly found on laparoscopy and involves the presence of tubercles on the tubes, more so at the junction of the tubes with mesosalpinx. These tubes are densely adherent to the surrounding structures and this stage is less amenable to surgery.

From the tubes the infection spreads to the uterus and the ovaries by direct spread. Infection may also occur by hematogenous spread but it is uncommon. Rarely, it may spread from peritoneum to ovary. Infection of the cervix occurs either from the endometrium or by hematogenous route. Vulval or vaginal tuberculosis may occur when these structures have injuries or abrasions in the presence of tubercle bacilli from the upper genital tract, lungs or the gastrointestinal tract and rarely can occur by sexual contact.

The infection in the endometrium occurs near the cornual area due to both anatomical proximity as well as common blood supply to the tubes. The basal area of the endometrium gets infected. These tubercles rise to the surface premenstrually, are shed off during menstruation and the endometrium gets reinfected from the tubes again. Endometrial tuberculosis may cause synechiae formation and lead to Ashermann syndrome. It may also result in infertility, recurrent abortions or secondary amenorrhea. The granulomatous lesions are usually best recognized on cycle days 24–26 or within 12 hours of the onset of menses.(14) In rare instances(2.5%), myometrium may get involved. Cervical tuberculosis may be ulcerative or nodular and presents as contact bleed and thus may be confused with cervical carcinoma. Histologically also there is marked epithelial hyperplasia with some degree of atypia which may lead to an erroneous diagnosis of carcinoma. Ovarian involvement is seen in about 30 per cent cases of tubercular salpingitis. There may be surface tubercles, adhesions, thickening of the capsule or even caseating abscess in the substance of the ovary. Vulval and vaginal tuberculosis is extremely rare and present as ulcerative lesions with undermined edges. They are usually diagnosed on histology.

Tuberculous Peritonitis

This entity is seen along with genital tuberculosis in 45% cases and is responsible for the extensive adhesions associated with tuberculosis of the pelvis.(15) Two types of this entity have been described - the plastic and the serous variety. The plastic variety is less common and is associated with tender abdominal masses a doughy feel to the abdomen on palpation. There may be symptoms suggestive of intestinal obstruction. The serous variety is more common and is characterized by ascitis, signs of peritoneal inflammation, fever, abdominal pain, weight loss, and anorexia. Most cases of the serous variety are insidious. Patients may be asymptomatic or may present acutely with chills, fever, ascitis, and sometimes, rebound tenderness. In cases with advanced disease, all pelvic organs are densely matted together, and the peritoneal surface is studded with tubercles and foci of caseation and calcified plaques. (15,16). Peritoneal fluid is exudative with lymphocytic predominance. There might be associated pleural effusion, but usually no parenchymal changes are seen on chest radiograph.

Clinical Features

Clinical diagnosis of genital tuberculosis requires a high degree of suspicion. Family history of the disease is of prime importance in diagnosing the disease and around 20% of patients with genital tuberculosis have a history of the disease in the immediate family.(12) In around 50% patients there might be a history of tuberculous pleurisy, peritonitis, erythema nodosum, or renal, osseous, or pulmonary TB. There may be associated symptoms of low grade fever, evening rise of temperature, generalized ill health, weight loss, or vague lower abdominal pain. Around 30-50% patients have received treatment for some type of extragenital tuberculosis.(12,17,18). Most patients are 20-40 years of age. Approximately 11% of patients are asymptomatic. (12,18,19,20) The symptoms associated with genital tuberculosis are tabulated as under:

Table 1 Symptoms Related To Genital Tuberculosis

SYSTEMIC	INFERTILITY
Weight loss	Primary
Fatigue	Secondary
Low-grade fever	
MENSTRUAL DISTURBANCES	**OTHER SYMPTOMS**
Amenorrhea	Abdominal swelling
Menorrhagia	Postcoital bleeding
Metrorrhagia	Vaginal discharge
Oligomenorrhea	Dyspareunia

Females with genital tuberculosis present with four major complaints with varying frequencies: amenorrhoea, pelvic pain, abnormal bleeding and infertility.

Infertility

This is the presenting complaint in 40-50% patients in most large series(21-24) and several authors have reported it to be the most common symptom. Around 85% of these patients have never been pregnant and the rest of these patients have developed the disease within 1 year of completion of their last pregnancy. There is also a possibility that being asymptomatic, these patients are diagnosed during the endometrial evaluation during the evaluation of infertility.

Pelvic Pain

This is second most frequent complaint and is seen in 25-50% patients.(18,22,23,25) The pain is dull aching and usually has been present for quite some time before the patient consults a clinician. There might be acute episodes of pain owing to secondary infection with pyogenic organisms. This pain is aggravated by menses, exercise and coitus and progresses in severity with the progression of the disease. The number of patients presenting with pain are proportional to those presenting with abdominal findings on physical examination.(20)

Menstrual disturbances

These symptoms are reported in 10-40% patients in the form of menorrhagia, menometrorrhagia, intermenstrual bleeding, oligomenorrhea, and postmenopausal bleeding.(19,20) In a study conducted by Samal *et al*, oligomenorrhoea was found in 54%, amenorrhea in 14.3%, menorrhagia in 19.9% and postmenopausal bleeding was seen in 1.6% patients.(26) The oligomenorrhoea and amenorrhoea have been attributed to end organ failure due to endometrial caseation.

Genital tuberculosis in totally asymptomatic women has been reported. Sometimes tubercular involvement of the ovaries and tubes leads to formation of tubo-ovarian masses which on ultrasonography mimics ovarian cancer. Raised levels of Ca 125 further add to the confusion.

Clinical Signs

There might be no appreciable clinical signs in around 35-50% of patients with genital tuberculosis.(19,27) A bimanual examination may reveal adnexal masses or fixed pelvic organs or a frozen pelvis. There may be associated pelvic tenderness. This tenderness is less than that of acute pyogenic infection, but can be sharp if a secondary infection exacerbates it. There might be other co-existing pelvic lesions like ovarian cysts, endometriosis, adenomyosis, cervical lesions etc which might be present and may confound the diagnosis. Abdomen may be "doughy" on palpation, which is attributed to tubercle formation on the intestines and peritoneum. There might be abdominal distension due to ascitis, which can be generalized, or sacculated. This ascitis can cause raised intraabdominal pressure and the patient might present with symptoms of uterine prolapse.(28) Irregular abdominal masses might be palpable because of matting together of the intestine with pelvic organs and omentum. Postmenopausal women may present with pyometra formation.(29,30) Clinical features may sometimes mimic that of an ovarian malignancy. Or rarely there might be a fistulous communication between the genital tract and the bladder, bowel or cutaneous area. This might occur due to rupture of tuberculous pyosalpinx into adjacent areas. Rarely, tubercular involvement of cervix and external genitalia might be seen.

Table 2 Clinical Signs of Genital Tuberculosis

Normal findings
Adnexal mass
Abdominal mass
Pelvic mass
Pelvic tenderness
Frozen pelvis
Vaginal discharge
Tubercular ascites
Ulcer in vulva, vagina or cervix
Fistula
Pyometra

Diagnosis

Diagnosis is made by a combination of high index of suspicion, a thorough clinical examination and using appropriate investigations. A previous history of pulmonary tuberculosis or a family history of same should arouse suspicion. Patients presenting with unexplained infertility, pelvic infection not responding to treatment, unexplained amenorrhea, postmenopausal bleeding, persistent leucorrhoea and pyometra where endometrial neoplasia has been excluded should be investigated for genital tuberculosis.

The various investigations suggested for diagnosis of genital tuberculosis are a combination of one or more of the investigations tabulated below:

Table 3 Evaluation for diagnosis of genital tuberculosis

Complete blood count
Chest radiograph
Tuberculin test
Menstrual blood for culture
Endometrial curettage
Histological examination
Culture for Mycobacterium tuberculosis
Peritoneal fluid and biopsy for culture and histopathological examination
Hysterosalpingography
Ultrasonography
Cervical cytology
Laparoscopy/ hysteroscopy/cystoscopy

Complete Blood Count

A complete blood count is usually normal but there might be lymphocytic predominance in the differential counts in some cases. The erythrocyte sedimentation rate might be raised.

Chest Radiograph

Active pulmonary involvement is rarely seen in genital tuberculosis. Chest radiographs show involvement in 10-50% of cases and most of these abnormalities are old healed lesions of pulmonary tuberculosis rather than active lesions.(9,31,32)

Tuberculin Test

In patients with genital tuberculosis, tuberculin test has a sensitivity of 55% and specificity of 80%.(33) False positive reactions represent non-tuberculous mycobacterium infections. False negative reaction are seen in almost 20% patients with known active tuberculosis. This may occur because of HIV infection and corticosteroid therapy.(34)

Cultures And Tissue Diagnosis

Suspected tuberculous lesions in accessible areas should be biopsied and swabs should be taken. Same should be sent for culture as well as histopathological evaluation. Vaginal, vulval and cervical tissues should be biopsied. Endometrium is another tissue which can be easily obtained for evaluation. It can be obtained either by aspiration, dilatation and curettage or by hysteroscopy. Endometrial tissue can also be obtained by menstrual blood collection since the most superficial layers of endometrium which are shed have the highest number of tubercles. Ideal time for endometrial sample collection is late secretory or pre-menstrual phase. Other samples which can be helpful for tuberculosis diagnosis are peritoneal cytology which can be done on ascitic fluid and lesions from the uterus, ovaries, tubes and pelvis which can be taken during laparoscopy or laparotomy.

Typical granulomatous lesion with epitheloid cells can be seen on histopathology. This picture though highly suggestive of tuberculosis is not specific and can also be observed in fungal infection and sarcoidosis.

Acid fast bacilli can be seen on microscopic examination and this can aid in an early diagnosis. Ziehl-Neelsen (Z-N) and fluorescent Auramine Phenol are other stains which can help to aid diagnosis. For a positive result, 10-100 bacilli/ml of sample is required. Culture gives a definitive diagnosis and is more sensitive. For a culture to be positive, 10-100 bacilli/ml of sample is required. Culture on Löwenstein-Jensen medium can give earliest positive reports in 4 weeks but may take upto 12 weeks. Liquid culture with radiometric growth detection such as BACTEC-460 or nonradiometric (CO2) growth detection such as BacTAlert 3D, provides more rapid growth(average 10–14 days), specific identification of *M. tuberculosis* and rapid drug susceptibility testing to guide therapy.(34) Rapid nucleic acid amplification techniques such as polymerase chain reaction (PCR) help to directly identify *M. tuberculosis* in clinical specimens. PCR assays can detect <10 bacilli/ml including dead bacilli. They have a testing time of 8-12 hours.

A single negative curettage or biopsy does not exclude the diagnosis and serial sections might be needed to reach the diagnosis as the lesions are frequently patchy. According to Falk *et al*, positive endometrial culture is seen in only 25% patients with tubercular endometritis.(18)

Dilatation and curettage may increase the rate of diagnosis merely by increasing the amount of tissue available for diagnosis. An Z-N staining of the endometrial curetting is a rapid test and 10 organisms per ml are required for a positive result.(48)

Radiological Evaluation

Two imaging techniques which are helpful in diagnosis of tuberculosis are ultrasonography and hysterosalpingography.

Ultrasonography: Findings may wary from a totally normal scan to that with abnormalities in one or more area of the genital tract. The tubes may be dilated and may be filled with clear or caseous fluid leading to a hydrosalpinx or pyosalpinx respectively. The endometrial cavity may be filled with caseous materialcausing pyometra. The endometrium may give a heterogenous appearance with hyperechoic areas of calcification and fibrosis. There may be endometrial abnormalities like intrauterine adhesions, distorted uterine cavity, endometrial thinning or thickening, altered endometrial vascularity in stimulated cycles and calcified subendometrium. Other abnormalities which can be observed on ultrasonography are ascitis or loculated peritoneal collections, enlarged ovaries, adnexal fixation and abdominopelvic masses. Computed tomography or magnetic resonance imaging may be required for further evaluation of these findings.

Hysterosalpingography (HSG)

Genital tuberculosis causes structural changes in the involved organs and gives rise to specific findings of the tubes, uterus and the cervix on hysterosalpingography. Tubal changes may consist of tubal dilatation, tubal occlusion, hydrosalpinx, irregular contour or diverticular outpouching (salpingitis isthmica nodosa). Other changes include specific patterns like' cotton wool plug', 'pipestem tube', 'golf club tube',

'cobblestone tube', or 'beaded tube'. The occlusions and adhesions in the peritubal region may present as straight spill, corkscrew appearance or peritubal halo. There could be multiple constrictions visible in the tube or there may be irregular linear or nodular calcifications in the adnexal area.(35,36)

There can be intrauterine synechiae formation which causes distortion of the endometrial cavity or its complete obliteration. This can be visualized on hysterosalpingography as norrowing of the cavity or specific findings like 'T-shaped' uterus or 'pseudounicornuate' uterus.(37,38) Extensive destruction of the endometrium and myometrium by chronic inflammatory process can result in complete narrowing of the uterine cavity. This appears as gloved finger comprising cervical canal and a small part of the uterus and is called Netter Syndrome.(39)

Irregular and distorted cervical contour, serrated endocervical canal and diverticular outpouching can be seen on hysterosalpingography when the cervix is involved.(39,40)

Endoscopy: Laparoscopy and hysteroscopy should be performed simultaneously in a patient with suspected genital tuberculosis.

Hysteroscopy: On hysteroscopy, findings vary from totally normal cavity to a small shrunken cavity with multiple adhesions. Endometrium is usually pale looking. In view of the adhesions of varying grade in the uterine cavity, it is usually partially or completely obliterated.(41) This makes the procedure difficult with higher rate of complications like bleeding, making false tracts, perforations and also further flare up of the disease.

Laparoscopy: In the subacute stage, tuberculosis presents as congestion, edema and adhesions in the pelvic cavity with military tubercles and plaques over the uterus and the tubes. In the chronic stage, apart from the presence of tubercles and caseation over the pelvic organs, there might be nodular salpingitis, fimbrial phimosis and unilateral or bilateral hydrosalpinx. These hydrosalpinx are usually filled with caseous material. The adhesions in genital tuberculosis may involve the omentum and the gut with the incidence of perihepatic adhesions as high as 48%.(43,44) In a laparoscopic study on 85 females with genital tuberculosis, it was observed that 15.9 % patients had peritoneal tubercles , 26 % had tubo-ovarian masses , caseous nodules were seen in 7.2 %, encysted ascites in 8.7 %, pelvic adhesions in 65.8 %, hydrosalpinx in 21.7 %, pyosalpinx in 2.9 %, beaded tubes in 10 %, tobacco pouch appearance in 2.9 % and inability to see tubes due to adhesions in 14.2 %.(45) Also, a higher rate of complications with laproscopy has been observed in patients with tuberculosis than those without it.(46) According to Baxi *et al,* the sensitivity, specificity and negative predictive value of hysterolaproscopy is 85.7%, 22.2% and 77% in comparison to polymerase chain reaction.(47)

Treatment

Medical treatment

Treating latent genital tuberculosis on the basis of PCR positivity is controversial due to high false positive rate. Many clinicians believe in treating these patients reasoning that treatment at this stage prevents inflammatory sequlae and permanent damage to the endometrium and other genital organs. Jindal *et al* (50) and Kulshreshtha *et al* (51) have reported good results by treating PCR positive patients. Short course of chemotherapy for six to nine months is considered adequate and is found to be effective for female genital tuberculosis.

In its recent guidelines for tuberculosis treatment, WHO has removed category 3. Genital tuberculosis is covered in category 1 as seriously-ill extrapulmonary tuberculosis. According to the index TB guidelines for extrapulmonary tuberculosis, WHO has recommended daily therapy of rifampicin(R), isoniazid (H), pyrazinamide(Z) and ethambutol(E) for 2 months followed by daily therapy of rifampicin(R) and isoniazid (H) for four months. Alternatively, intensive therapy with HRZE daily for 2 months can be given followed by alternate day rifampicin(R) and isoniazid (H) for four months in the continuation phase. All the above mentioned regimens are given under the DOTS (Directly Observed Treatment Shortcourse) treatment strategy. Three weekly dosing (2HRZE+4HR) throughout the course are also available in DOTS.

ATT : DRUGS AND DOSAGES	
DRUG	DOSAGE
ISONIAZID	600mg
RIFAMPICIN	450mg(600mg if >60kg)
PYRAZINAMIDE	1500mg
ETHAMBUTOL	1200mg
STREPTOMYCIN	0.75g

Patients not opting for DOTS treatment should take daily treatment consisting of HRZE for 2 months (intensive phase) and HR for 4 months (continuation phase)

On rare occasions, genital tuberculosis patients have a relapse or failure, and these patients are then categorized into category 2 . Therapy for these patients includes thrice weekly injections of streptomycin for two months along with HRZE under direct supervision of DOTS centre followed by HRZE thrice a week for another month (intensive phase) followed by a continuation phase consisting of HRE , thrice weekly for 5 months.

Treatment of chronic, drug resistant cases and multidrug resistant cases is same as for pulmonary MDR with second line drugs and is needed for a duration of 18-24 months.

Surgical Treatment

Surgical treatment is not the preferred modality for management of genital tuberculosis. However it may be required in cases of large tubo- ovarian masses and abscesses. Surgery in tuberculosis in any form, laparotomy, laparoscopy or hysteroscopy is associated with higher complication rates in view of dense adhesions which form as a result of the inflammatory process involved in the disease. There are instances where the abdomen is found to be totally plastered. Surgical exploration is not advisable in such cases, and samples should be collected for biopsy and culture.

Anatomic restoration of the tubes can be done in some cases after the medical therapy. However, certain anatomical distortions and consequent infertility may occur as an irreversible consequence of genital tuberculosis and giving repeated ATT to such patients is of no proven benefit.

CONCLUSION

Female genital tuberculosis is not an uncommon infection but is difficult to diagnose as the clinical presentation is similar to

many other gynaecological and nongynaecological diseases. Patients presenting with unexplained infertility, pelvic infection not responding to treatment, unexplained amenorrhea, postmenopausal bleeding, persistent leucorrhoea and pyometra where endometrial neoplasia has been excluded should be investigated for genital tuberculosis. Prompt diagnosis and institution of antitubercular therapy at early stages prevents long term sequalae of the disease. Surgical treatment is effective in some cases but is not very promising in patients with tuberculosis associated infertility.

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