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Original Research Article

Laparoscopic Diagnosis of Genital Tuberculosis during Infertility Work Up, a Retrospective Study

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Abstract

Background: Genital Tuberculosis is one of the leading causes of infertility in Bangladesh which is a high tuberculosis burden country. As the patients are mostly asymptomatic and diagnostic tests have low sensitivity and specificity, diagnosis of genital tuberculosis is very much challenging. The aim of this study is to evaluate the patients of genital tuberculosis diagnosed at laparoscopy. ***Methods:*** A retrospective study was performed on 12 patients who underwent laparoscopy and hysteroscopy. Cases were analyzed according to history, relevant pre surgery investigation findings, laparoscopic and hysteroscopic findings, histopathology, MTB PCR and Acid-Fast Bacillus (AFB) tests reports. ***Results:*** Mean age 25 years, range (22 -33), ten (83.3%) with primary subfertility and two (16.6%) with secondary subfertility. Two had secondary amenorrhea, two women presented with scanty menstrual flow and seven women with regular cycle with average flow and duration. Two (16.6%) had previously completed treatment for pulmonary tuberculosis, 4(33.3%) had history of exposure to tuberculosis patient. Hysterosalpingography showed eleven (91.6%) cases with bilateral tubal block, one (8.3%) with only left tubal block. At laparoscopy all women had tubal involvement, ovarian involvement in 6(50%), frozen pelvis or dense pelvic adhesion in one. At hysteroscopy 11 (91.6%) cases had intrauterine adhesion. Histopathology of endometrial tissue revealed tubercular granuloma in two (16.6%) cases; MTB PCR was detected in 6(50%) cases and acid-fast bacillus was negative in all cases. ***Conclusions:*** Laparoscopic and hysteroscopic findings are more suggestive than history, microscopic, histopathological and molecular examination of endometrial tissue in diagnosing genital tuberculosis in infertile women.

Keywords: Female genital tuberculosis, laparoscopy, hysteroscopy, infertility.

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INTRODUCTION

The South-East Asian region is home to 26% of the world's population with 44% burden of tuberculosis incidence. Eight countries account for two thirds of the total; Bangladesh is the seventh of them [1]. Genital Tuberculosis is an important etiological factor for infertility in countries with high prevalence of tuberculosis. The incidence varies from 5% to 15% in South East Asia region [2].

Genital tuberculosis is usually secondary to other sites like pulmonary or abdominal tuberculosis. The spread is generally through hematogenous or lymphatic routes [3]. Female genital tuberculosis (FGTB) is usually presenting with menstrual

dysfunction (especially oligomenorrhea or amenorrhea), primary or secondary infertility, lower abdominal pain, chronic pelvic pain, and/or a pelvic mass.

However, the burden of genital tuberculosis in females is underestimated as most of the patients are asymptomatic and there is the lack of reliable diagnostics with high sensitivity [4] and usually diagnosed during evaluation for infertility. Most of the patients present in advanced stage with scarring, severe fibrosis and adhesions and outcome of fertility treatment is poor. The actual incidence of female genital tuberculosis cannot be estimated accurately; only 50% of cases are diagnosed without surgery [5].

As a high tuberculosis burden country Bangladesh has genital tuberculosis as important etiological factor for infertility. To prevent the permanent sequelae of genital tuberculosis early diagnosis is necessary. This study aimed to evaluate the role of laparoscopy in diagnosis of genital tuberculosis and its relation to clinical presentations, other microbial and molecular assays.

MATERIALS AND METHODS

This retrospective, observational study was performed on 12 patients, who underwent laparoscopy and hysteroscopy as a part of infertility work up in Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh, from July 2018 to July 2019. They were diagnosed to have features of genital tuberculosis.

Cases were analyzed according to history, relevant pre surgery investigation findings, laparoscopic and hysteroscopic findings, histopathology, MTB PCR and Acid-Fast Bacillus (AFB) tests reports. Male factor, ovulatory factors of infertility and other sexually transmitted infections were excluded.

RESULTS

All cases presented with infertility and were from low socioeconomic background. The mean age was 28.16±3.66 years. Maximum (75%) patients came from rural areas. Table-1 describes the demographic characteristics of the patients.

Table-1: Demographic characteristics

Parameters	No of patients(n=12)	Percentage
Age in years		
20-30	8	66.6%
31-40	4	33.3%
Residence		
Rural	9	75%
Urban	3	25%
Nature of infertility		
primary	10	83.4%
secondary	2	16.6%

In present study majority of the patients (68.30%) had regular menstrual cycle (Figure 1). Two women (16.6%) presented with secondary amenorrhea, two (16.6%) with scanty menstrual flow and one (8.3%) with heavy menstrual bleeding.

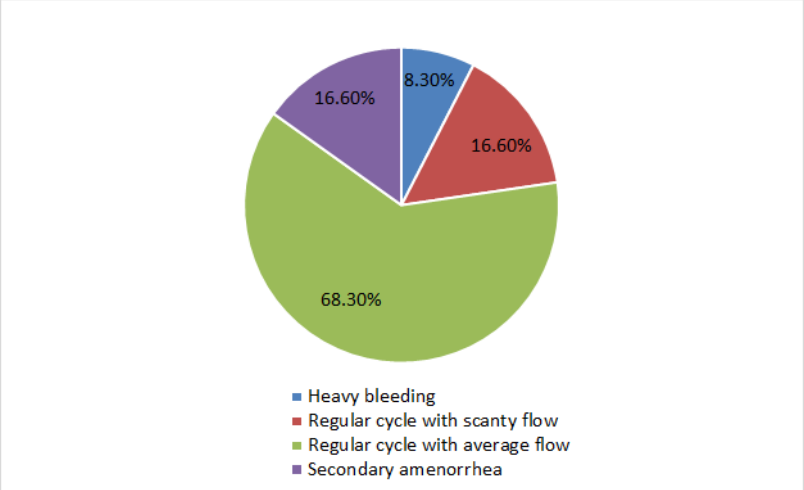

Fig-1: Menstrual pattern

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Two (16.6%) patients had completed treatment of pulmonary tuberculosis and 4(33%) had history of exposure to tuberculosis patient.

Regarding initial evaluation, ESR ranged from 30-55 mm in 1st hour in 5(41.7%), Monteux test was positive in 2(16.6%) cases. Chest X-ray was normal in 10 (83.3%) cases; the remaining 2 (16.6%), with history of pulmonary tuberculosis had healed old lesion.

All women had abnormal hysterosalpingographic findings. 58.3% had bilateral cornual block and one had unilateral patent tube (Figure 2).

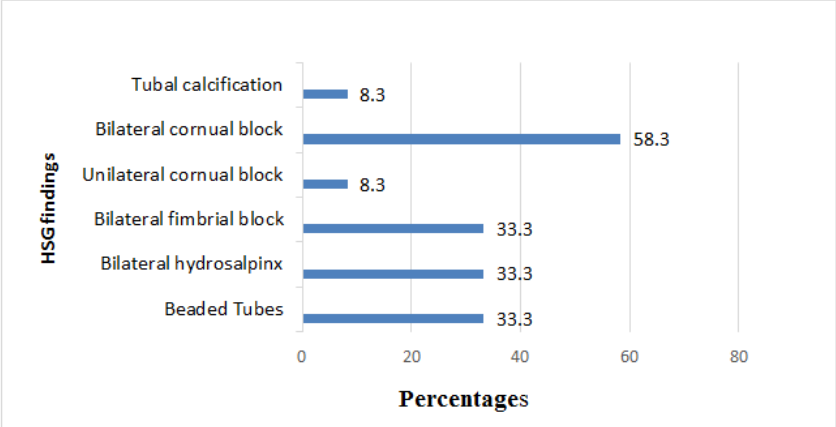

Fig-2: Hysterosalpingographic findings

At laparoscopy, there were peritubal and periovarian adhesions (n= 10 [83.3%]), and frozen pelvis or dense pelvic adhesion in one, bowel and omental adhesion in 1(8.3%) case. There were dilated, tortuous, tubes n=9(75%), beaded tubes (n= 2[16.6%]), hydrosalpinx (n=4[33.3%]), ovarian involvement in 6(50%), vesicles on the uterus and tubes (n= 2[16.6%]) and caseous material on the fallopian tubes with edema (n= 1 [8.3%]) as well as tubo-ovarian masses (n= 3 [25%]). There were 11 cases (92%) having no spillage from any tubes and only one case (8.3%) had delayed spillage from one tube (Table-3).

Moreover, intrauterine adhesions were found on hysteroscopy (n= 11 [91.6%]) from mild to severe form. In case of frozen pelvis hysteroscopy was not done.

Table-3: Laparoscopic findings

Laparoscopic findings	No of the patient (n=12)	Percentage (%)
Peritubal and periovarian adhesions	10	83.3%
Dense pelvic adhesion	1	8%
Bowel/omental adhesions	1	8%
Hydrosalpinx	4	33.3%
Beaded tubes	2	16.6%
Tubo-ovarian mass	3	25%
Cornual block	7	58.1%
Delayed spillage	1	8.3%
Congestion	2	16.6%

Biopsies were taken from suspicious areas for histological evaluation, PCR assay, and AFB culture. Histopathology of endometrial tissue revealed tubercular granuloma in two (16.6%) cases, MTB PCR was detected in 6(50%) cases and acid-fast bacillus was negative in all cases (Table 4).

Table-4: Examination of endometrial tissue

Test name	No of patients(n=12)	Percentage (%)
MTB PCR	6	50%
AFB	0	0
Histopathology	2	16.6%

All patients had anti tuberculosis therapy according to national guideline. One patient conceived while on anti-tuberculosis therapy and delivered a healthy baby in August 2019. Others were counseled

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for in vitro fertilization after completion of anti-tuberculosis therapy.

DISCUSSION

Advancement of antitubercular therapy under DOTS (Direct Observed Treatment, Short course) guideline and wider use of ART (Artificial Reproductive Techniques) have improved the outcomes of genital tuberculosis for the women diagnosed in the earlier stages. But the majority of the women are diagnosed in advanced stage. Therefore, a reliable and rapid diagnostic criterion is necessary for early diagnosis of the disease.

Our study suggests that laparoscopy and hysteroscopy is an important diagnostic tool for genital tuberculosis. They allow for confirmation of disease by taking biopsy for histopathology and PCR assay irrespective of clinical features and investigation findings. The study gives full spectrum of clinical features and investigational findings which help to increase clinical suspicion and confirm genital tuberculosis in infertile women in Bangladesh.

Female genital tuberculosis is a disease of young age, with 80-90% of patients diagnosed between 20-40 years of age and most of the women present with infertility [6]. In our study the mean age of women with genital tuberculosis was 28 years and 83.3% women presented with primary infertility. Early marriage is prevalent in Bangladesh and adolescents are most vulnerable to genital tuberculosis, a factor that explains the findings.

Primary genital tuberculosis is extremely rare. A history of previous diagnosis or treatment of extra genital tuberculosis is present in 25-50% of patients [7]. In our study 16.6% patients had a previous history of extra genital TB and 33.3% patients had history of exposure to TB patient, thus 50% had no relevant history. The relative absence of history of diagnosed extra genital tuberculosis may be due to presentation with infertility at an earlier age and subclinical nature of genital tuberculosis in infertile women.

Abnormal uterine bleeding in genital tuberculosis has been reported in 10%-40% of patients [8]. Our study had 41.6% patients presenting with menstrual abnormalities like heavy menstrual bleeding, regular cycles with scanty flow and secondary amenorrhea.

Tuberculosis of genital tract is difficult to diagnose in infertile women because of absence of symptoms other than infertility, or varied clinical presentation, the limited sensitivity and specificity of findings of the imaging, laparoscopy, and histopathology, bacteriological and serological tests [6]. Hence early diagnosis of genital tuberculosis remains a clinical challenge.

Laparoscopy and hysteroscopy are important in standardized protocol for evaluation of infertile women. Based on the laparoscopic visual inspection (LVI) several reports have described findings suggestive of genital tuberculosis [9, 10]. Findings suggestive of sub-acute stage include congestion, edema, military tubercles, and white yellow and opaque patches on uterus, tubes, ovaries and peritoneum. Chronic stage findings are tubal block, beaded tubes and hydrosalpinx. Most of our findings were suggestive of chronic stage. Fallopian tubes are the initial and most frequently affected site in pelvic mycobacterial infection [3].

Tuberculosis is described as a significant underlying etiology of intrauterine synechiae [10]. In our study hysteroscopy revealed endometrial involvement in the form of mild to severe intrauterine synechiae in 83.3% cases. Venkatesh *et al.*, 2016 reported less than 50% endometrial involvement. This can be explained by the fact that all of our cases were in chronic stage with advanced endometrial disease.

In the present study histopathology of endometrial tissue revealed tubercular granuloma in 16.6% cases, MTB PCR was detected in 50% cases and acid-fast bacillus was negative in all cases. Thangappah *et al*. showed in their study that positive acid-fast bacillus (AFB) smear was present in 8.3 %, histopathological examination positive for granuloma in 6.9 % and MTB PCR positive in 36.7 % of cases of genital tuberculosis diagnosed at laparoscopy [11]. Though smear and culture remain a gold standard in diagnosis of pulmonary TB, the very low sensitivity for diagnosis of paucibacillary disease limits its practical utility in extra-pulmonary tuberculosis. [12, 13].

Women diagnosed to have genital tuberculosis at laparoscopy had TB PCR positive endometrial tissue in 50% cases whereas it was 60% in the study by Venkatesh *et al*., 2016. This implies that endometrial TB-PCR and laparoscopy are complementary tests and the two together can effectively confirm an early clinical diagnosis of genital tuberculosis. The limitation of PCR is false positive and false negative results, which were found in 9.5 % cases in Thangappah et al study.

Genital tuberculosis is an important cause of infertility in Bangladesh. All patients with genital tuberculosis need a full course of anti-tuberculosis therapy according to DOTS guidelines, i.e., isoniazid, rifampicin, ethambutol, and pyrazinamide for 2 months followed by isoniazid and rifampicin for the next 4 months. Though most of the patients appeared in advanced stage, one patient conceived naturally and delivered timely. For others treatment outcomes regarding infertility were poor.

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CONCLUSION

Genital tuberculosis is the disease of young women, majority of them presenting with no symptom other than primary infertility. Tubal involvement and intrauterine adhesion appear to be the common factors causing infertility. Laparoscopic and hysteroscopic findings are more suggestive of genital tuberculosis than clinical features and other investigation findings in infertile women. Laparoscopy and hysteroscopy in addition to comprehensive clinical assessment and investigation lead to early diagnosis and timely intervention which can prevent the permanent and irreversible sequelae of genital tuberculosis.

Conflict of interest

The authors declare they have no conflict of interest.

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