Female genital tuberculosis and infertility

B. Namavar Jahromi\textsuperscript{*,a}, M.E. Parsanezhad\textsuperscript{a}, R. Ghane-Shirazi\textsuperscript{b}

\textsuperscript{a}Department of Obstetrics and Gynecology, Shiraz University of Medical Sciences, Shiraz, Iran
\textsuperscript{b}Tuberculosis Control Unit, Health Center of Fars Province, Shiraz, Iran

Received 1 May 2001; received in revised form 7 August 2001; accepted 8 August 2001

Abstract

Objectives: This study was performed to evaluate the rate of diagnosed female genital tuberculosis and its presentational symptoms and methods of diagnosis. Methods: A total of 3088 cases of tuberculosis (TB) who had been registered and treated in the Health Center of Fars Province from 1989 to 1999 were retrospectively studied. From this group, 46 women were diagnosed as having genital TB. The diagnosis in 41 cases was based on the standard pathological criteria of tissue specimens. The other five cases were excluded from this study due to the lack of classical diagnostic criteria. Statistical analysis was performed using the \textit{Z}-test. Results: The mean age of the patients at the time of diagnosis was 30.4 years. Seven patients presented with abdominal or pelvic pain (17.07\%). In this group three cases underwent laparotomy due to abdominal mass and four patients for tubo-ovarian abscess, which led to the diagnosis. Abnormal uterine bleeding was the cause of diagnostic dilatation and curettage in three other patients (7.31\%). However, in 31 cases (75.6\%) TB was diagnosed during studies performed to evaluate the cause of their infertility, and the most common diagnostic procedure was endometrial curettage (25 cases). Female genital TB accounted for 1.32\% of all tuberculous patients in this study. Of these, 75.6\% were infertile by definition ($Z = 12.13, P < 0.0001$). TB endometritis was detected in 72.03\%, tubal involvement in 34.03\%, ovarian TB in 12.9\% and cervical TB in 2.4\% of the patients. Conclusions: This study confirms the presence of a strong relationship between genital TB and infertility; therefore genital TB would be more frequently diagnosed if this possibility was considered in the evaluation of every infertile patient in areas where tuberculosis is endemic. © 2001 International Federation of Gynecology and Obstetrics. All rights reserved.

Keywords: Female genital tuberculosis; Infertility
1. Introduction

Tuberculosis (TB) is one of the oldest diseases known to affect humans [1]. Female genital TB is a rare disease in some developed countries, but it is a frequent cause of chronic pelvic inflammatory disease (PID) and infertility in other parts of the world [2]. Unfortunately, the incidence of TB is again increasing. Approximately 3.8 million new cases of TB were reported annually to the World Health Organization in the early 1990s [1]. However, it is estimated that a total of 7.96 million new cases of tuberculosis occurred world-wide in 1997. A total of 1.86 billion people or 32% of the world’s population are infected with Mycobacterium TB [3]. Dramatic outbreaks of multidrug-resistant TB in some populations have focused international attention on the seriousness of this matter, due to its significant threat to TB-control [4]. It is estimated that patients with pulmonary TB develop genital infection in 5–13% of cases [2–6]. Therefore cases of TB-associated PID may also become more prevalent [2].

The purpose of this study is to evaluate the rate of diagnosed female genital tract tuberculosis, its presentational symptoms and methods of diagnosis, in a 10-year period (1989–1999) among the patients referred to the Health Center of Fars province. All suspected cases in this area are referred to this center, for proper diagnosis and free management.

The actual incidence of genital TB cannot be assessed accurately in any population since it is estimated that at least 11% of the patients are asymptomatic and the disease may be discovered incidentally [6]. However, the symptoms usually associated with female genital tuberculosis are lower abdominal and pelvic pain, infertility and menstrual abnormalities [1,2].

A definitive diagnosis of genital TB is dependent on a positive mycobacterial culture from a diagnostic specimen, although most authorities today accept a diagnosis based on the standard histopathological criteria of tissue biopsies [1,7]. In fact, more than two-thirds of the cases of genital TB in the literature were diagnosed by histopathological evidence [2].

Although characteristic X-ray findings for TB of the fallopian tubes and uterus have been described, an absolute diagnosis of genital TB cannot be made from a hysterosalpingogram. A positive chest roentgenogram for healed or active pulmonary TB, a strong contact history and a positive standard tuberculin test can also aid diagnosis [2,8].

2. Subjects and methods

A total of 3088 cases of TB who had been registered and treated in the Health Center of Fars province during 1989–1999 were retrospectively studied. There were 1843 cases of pulmonary TB and 1245 patients with extrapulmonary TB. From this group, 46 women were diagnosed as having genital tract TB (Table 1).

The diagnosis of genital TB in 41 cases was based on histopathological criteria of tissue specimens. However, empirical treatment had been started in five cases due to the characteristic changes in the hysterosalpingograms, positive tuberculin tests and strong contact histories. This last group was excluded from the study due to the lack of classical diagnostic criteria.

Infertility is defined as 1 year unprotected intercourse without conception [9,10]. The microscopic picture suggestive of genital TB is similar in all of the pelvic organs with tubercles of granulomatous inflammation, Langhans’ giant cells, epithelioid cells and central caseation associated with chronic inflammation [2,8,11–13]. With special stains, acid-fast bacilli (AFB) can be demonstrated on careful microscopic examination of the tubercles [1,13–15], and this evaluation was performed in all cases.

Tuberculin tests were performed for all patients by intracutaneous injection of 0.1 ml purified protein derivative-tuberculin (5 tuberculin units) and assessed for the presence of induration within 48–72 h. A positive tuberculin test is defined as an induration size of more than 10 mm [16].

All of the cases were evaluated for the presence of other extragenital foci of tuberculosis using sputum and urine cultures and chest roentgenograms at the time of diagnosis.
Table 1
Distribution and number of patients

<table>
<thead>
<tr>
<th>Year</th>
<th>Pulmonary TB</th>
<th>Extrapulmonary TB</th>
<th>Female genital TB</th>
<th>Total TB patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>1989</td>
<td>144</td>
<td>101</td>
<td>8</td>
<td>245</td>
</tr>
<tr>
<td>1990</td>
<td>188</td>
<td>32</td>
<td>4</td>
<td>220</td>
</tr>
<tr>
<td>1991</td>
<td>234</td>
<td>112</td>
<td>3</td>
<td>346</td>
</tr>
<tr>
<td>1992</td>
<td>146</td>
<td>110</td>
<td>5</td>
<td>256</td>
</tr>
<tr>
<td>1993</td>
<td>153</td>
<td>139</td>
<td>6</td>
<td>292</td>
</tr>
<tr>
<td>1994</td>
<td>134</td>
<td>102</td>
<td>3</td>
<td>236</td>
</tr>
<tr>
<td>1995</td>
<td>188</td>
<td>141</td>
<td>6</td>
<td>329</td>
</tr>
<tr>
<td>1996</td>
<td>141</td>
<td>122</td>
<td>3</td>
<td>263</td>
</tr>
<tr>
<td>1997</td>
<td>162</td>
<td>126</td>
<td>2</td>
<td>288</td>
</tr>
<tr>
<td>1998</td>
<td>215</td>
<td>139</td>
<td>3</td>
<td>354</td>
</tr>
<tr>
<td>1999</td>
<td>138</td>
<td>121</td>
<td>3</td>
<td>259</td>
</tr>
<tr>
<td>Total</td>
<td>1843</td>
<td>1245</td>
<td>46</td>
<td>3088</td>
</tr>
</tbody>
</table>

Statistical analysis was performed by the Z-test. Significance was defined as a P-value < 0.05.

3. Results

The mean age of the patients at the time of diagnosis was 30.4 years, with a range of 16–70 years. Seven patients presented with abdominal or pelvic pain (17.07%). In this group three cases underwent laparatomy because of the presence of abdominal mass and ascites and therefore suspected ovarian malignancy (7.31%) while four patients (9.75%) were operated due to a tubo-ovarian abscess unresponsive to various medications, and histopathological examinations showed tuberculosis. Abnormal uterine bleeding was the cause of diagnostic dilatation and curettage in three other patients (7.31%). However, 31 patients (75.6%), presented with infertility and TB was diagnosed during studies to evaluate the cause of their infertility. In this infertile group diagnosis was established in 25 cases by endometrial curettage and in four patients by biopsies taken from tubes or ovaries during laparatomy. Diagnostic laparoscopy in two other cases revealed gross inflammation and tortuosity of the tubes with multiple strictures and obstruction, when tubal biopsy led to the diagnosis.

Female genital TB accounted for 1.32% of all tuberculous patients in this study. Although 82.92% of our patients with genital TB had never been pregnant, 75.6% of them were infertile by definition (Z = 12.13, P < 0.0001), as compared with the infertility rate of 11.2% in the general population in this area [17].

TB endometritis was detected in 72.03%, tubal involvement in 34.03%, ovarian TB in 12.9% and cervical TB in 2.4% of the patients.

Tuberculin tests were positive in all of the patients with a mean induration size of 17 mm (14–24 mm). Among these 41 patients, seven cases (17.07%) were Afghan immigrants.

All of the sputum and urine cultures performed for the patients were negative, except in one case (2.43%) whose sputum culture was positive at the time of diagnosis of genital TB. AFB was seen in direct smears of tissue biopsies in only five cases (12.19%).

4. Discussion

This study confirms that infertility is the most common symptom associated with genital TB [18–20]. At present unexplained infertility is diagnosed in 10–15% of infertile couples [10]. Tuberculosis seems to be an important underdiagnosed factor. Since genital TB often causes no physical symptom, asymptomatic infertile women should
be investigated for silent or subclinical genital TB especially in high risk populations [20].

Tubal infection was confirmed in 34.3% of the cases in our study vs. 90–100% in other investigations [2,6]. Their higher incidence may be due to more frequent laparotomies performed in such cases.

Tuberculous endometriosis occurs in 60–70% of women with genital TB [2,6] and our results were similar (72.03%). Endometrial curettage was the most common route of diagnosis in this study, perhaps because the uterus is more accessible for taking biopsies.

As this study shows, direct smears are infrequently positive since it has been estimated that approximately 100,000 mycobacteria per milliliter must be present in the specimen to give a positive result. Also as a rule, active extragenital foci of tuberculosis are rarely present when the genital lesion is discovered [8].

Although no significant increase in the diagnosed number of patients with tuberculosis or genital TB was seen in this 10-year survey, data show that the incidence of TB has begun to increase in the mid-1980s, even in many industrialized countries [1]. In spite of this, in some of the recently published gynecology textbooks, not more than a few paragraphs has been attributed to genital TB. Genital TB is uncommon, so the clinical index of suspicion among gynecologists is generally low. It seems that more attention should be paid to this disease, because proper diagnosis and early treatment needs more accurate training and discussion.

5. Conclusion

This study shows that infertility is the most common initial symptom of female genital TB and more cases of genital TB would be diagnosed if this disease is considered in the evaluation of every infertile patient in areas where tuberculosis is endemic.

References