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Case Report

Mantoux Test: Forgotten But Still Relevant

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ABSTRACT

Tuberculosis (TB) is a major public health problem worldwide. India accounts for 1/4th of the global cases. Pulmonary TB is common in males whereas genital TB is common among females, usually in the latent form. Female genital TB presents as chronic infertility resulting from unilateral or bilateral tubal block. It is an important cause of failure of assisted reproductive techniques. We have various tools to diagnose TB, but genital TB has some limitations particularly due to deep seated involvement of the fallopian tubes. Mantoux test appears to be a useful tool in such cases. The present case highlights how the diagnosis of genital TB was missed in an infertile woman in spite of using routine testing methods and Mantoux test paved the way towards the right direction; and the treatment resulted in successful outcome.

KEYWORDS: Extra-Pulmonary Tuberculosis, Infertility, Mantoux test.

INTRODUCTION

Extra-pulmonary Tuberculosis (EPTB) is caused by an infection of *Mycobacterium tuberculosis* of the tissues outside of the lungs. The estimated incidence of tuberculosis (TB) in India was 2.1 million cases in 2013, 16 per cent of which were EPTB cases, equating to 336,000 people with EPTB[1]. EPTB affects various organ systems of the body but some systems pose a particular challenge in the diagnosis. One such form of infection is genital TB. Genitourinary TB is a common form of extra pulmonary TB (EPTB) worldwide (27%) with genital TB alone accounting for 9 per cent of all EPTB cases[2]. Genital TB in females is an important cause of infertility. A study among women with infertility registered for *in vitro* fertilization in north India reported the prevalence of genital TB in patients with tubal factor infertility as 48.5 per cent[3]. A survey by the Indian Council of Medical Research (ICMR) reported that prevalence of female genital tuberculosis (FGTB) in India has increased from 19 per cent in 2011 to 30 per cent in 2015. A multicentric ICMR study team is working on developing a nationally applicable algorithm for diagnosis and management of FGTB[4].

The diagnosis of pulmonary TB is usually confirmed by detection of M. tuberculosis bacteria in the sputum or by Cartridge - based nucleic acid amplification test (CBNAAT). Despite availability of various diagnostic techniques, a diagnostic dilemma still exists especially for genital TB. High degree of clinical suspicion, elaborate history taking, systemic examination, battery of tests to document *M. tuberculosis* as well as imaging methodologies for characteristic structural changes are essential for the diagnosis[5]. Mantoux test (MT) or Tuberculin Skin Test (TST) is yet another diagnostic tool which can be really useful in cases of extra-pulmonary or latent TB.

Mantoux test involves administering a standard dose of five tuberculin units (TU) (0.1ml) injected intradermally (into

the skin) and read 48 to 72h later[6]. The reaction to intracutaneously injected tuberculin is the classic example of a delayed (cellular) hypersensitivity reaction.

Features of the reaction include (*1*) its delayed course, reaching a peak more than 24 h after injection of the antigen; (*2*) its indurated character; and (*3*) its occasional vesiculation and necrosis.

A person who has been exposed to the bacteria is expected to mount an immune response in the skin containing the bacterial proteins.

Past study conducted showed the sensitivity of Mantoux test (MT) in active tuberculosis is 86%[7].

The positive predictive value of the Mantoux tests was 19.9%, while the negative predictive value is 95.4%[8].

This case is presented to report the diagnostic relevance of MT in a woman suffering from infertility due to genital TB which remained undiagnosed using routine diagnostic methods and where Mantoux test directed the right way.

CASE DETAILS

A 33 -year-old female who is a known case of PCOD presented with the primary baseline complaint of infertility after 15 years of marriage with normal male factors.

She underwent various investigations including follicular study which showed normal ovulation but hysterosalpingography and diagnostic laparoscopy revealed bilateral fallopian tube blockage with normal uterus. (Fig.1)

She was investigated for extra pulmonary TB where chest X-ray (Fig. 2), ESR, IGRA (Interferon Gamma Release Assay) were normal. She was advised In Vitro Fertilization (IVF) for tubal factor infertility, but patient refused for the same. She later presented to the medicine department and was investigated further.

Figure 1: Hysterosalpingogram showing bilateral tubal blockage

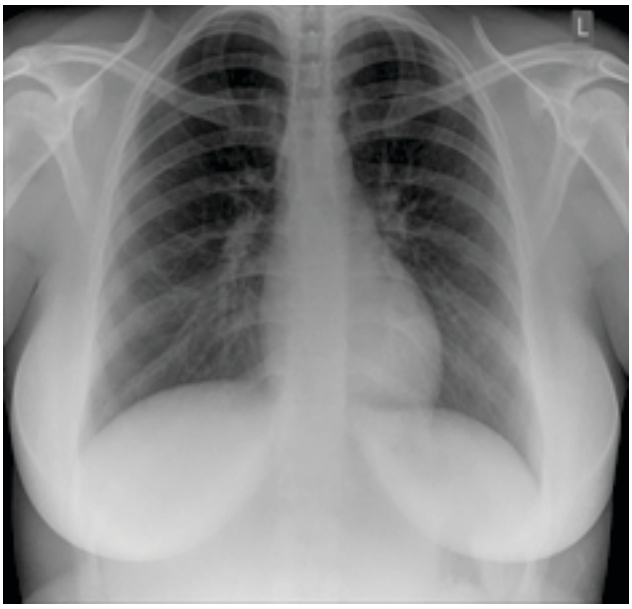

Figure 2: Chest X-ray showing normal lung field

Mantoux test was performed which showed an induration of > 20mm after 72 hours on her left forearm with multiple minor blisters (Fig.3), suggestive of strongly positive MT.

Patient was started on Anti Tubercular Therapy (ATT) consisting of Isoniazid (5mg/kg), Rifampicin (10mg/ kg), Pyrazinamide (25 mg/kg) and Ethambutol (15 mg/kg) for a duration of six months. Patient conceived naturally in the fifth month, ultimately delivering a healthy baby.

Figure 3: Mantoux test with induration >20mm and multiple blisters

DISCUSSION

Genitourinary TB is a common form of extra pulmonary TB (EPTB) worldwide accounting for 27% with genital TB alone accounting for 9 per cent of all EPTB cases[9]. However, the burden of genital TB in females is underestimated as most of the patients are asymptomatic and usually diagnosed during evaluation for infertility. A study on FGTB among patients with infertility from India has shown an incidence of 3-16 per cent[10]. Higher rates have been reported from tertiary hospitals in India probably due to referrals from different parts of the country for the diagnosis and management of difficult and complicated cases[11]. A study among women with infertility registered for *in vitro* fertilization in north India reported the prevalence of genital TB in patients with tubal factor infertility as 48.5 per cent[12].

M. tuberculosis affects the female genital organs, especially the fallopian tubes, resulting in blockage and thereby causes infertility. It can occur in any age group, but women in the reproductive age group (15-45 yr) are the most affected[13]. In most cases, the disease is asymptomatic or can present with a few symptoms among which infertility is the most common. Other symptoms reported are menstrual irregularities such as oligomenorrhoea, hypomenorrhoea, amenorrhoea, menorrhagia, dysmenorrhoea, metrorrhagia, pelvic pain and abnormal vaginal discharge. In postmenopausal women, genital TB presents with symptoms resembling endometrial malignancy, such as postmenopausal bleeding, persistent leucorrhoea and pyometra[10]. Genital TB can mimic or coexist with other gynaecological and abdominal pathologies such as genital carcinomas, acute appendicitis, ovarian cysts, PID, or ectopic pregnancy.

FGTB needs a thorough systematic clinical examination with high degree of suspicion and use of intensive investigations[14]. The possibility of FGTB should be considered in patients with chronic PID not responding to standard antibiotic treatment, unexplained infertility or in women with irregular menstrual cycle or postmenopausal bleeding and persistent vaginal discharge (where genital neoplasias have been excluded)[15].

A general examination to exclude a TB focus elsewhere in the body, X-ray chest, tuberculin skin test (TST), erythrocyte sedimentation rate (ESR) and complete blood count should be done at baseline. It has been reported that 10 to 75 per cent of patients with genital TB may have abnormal X-ray[16-18]. However, a negative chest X-ray does not rule out the possibility of genital TB. False-positive (non-TB mycobacterial, previous vaccination with BCG) and false-negative reactions (patients on steroid therapy, coexisting HIV infection, recent TB infection, chronic renal failure and people with typhoid fever, typhus, brucellosis, leprosy, pertussis) can also occur with TST. Abdelrub *et al*.[19] showed that TST was positive in 42.6 per cent of patients with genital TB. Raut *et al.*[20] reported sensitivity and specificity of TST as 55 and 80 per cent, respectively, in women with laparoscopically diagnosed TB.

This case highlights Mantoux Test as one of the important tools in the diagnosis of genital TB.

CONCLUSION

Extra pulmonary TB continues to be a diagnostic challenge despite the recent advances in diagnostic approaches in TB. Mantoux test is still relevant in those cases of extra pulmonary TB where routine methods for diagnosis are insufficient and not sensitive enough for confirming the latent/ active disease. Thus, it still holds relevance in current clinical practice especially in cases of latent or occult tuberculosis. The test is simple and cost effective; however, it needs further study on large number of patients.

CONFLICTS OF INTEREST: None

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