


A 27-Year-Old Woman with Genitourinary Tuberculosis: Diagnosis Problem in Rural Indonesia – Case Report

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ABSTRACT

Introduction: Genitourinary tuberculosis (TB) is one of the most common forms of extrapulmonary TB, yet it is often misdiagnosed due to its nonspecific symptoms and very often mimic recurrent urinary tract infections. **Case:** A 27-year-old woman was referred to the hospital with complaints of frequent and painful urination for the past six months, along with intermittent fever and occasional cough. She had received multiple courses of antibiotics, but her symptoms did not resolve. Laboratory investigations, including urine microscopy, LAM antigen, and Xpert MTB/RIF, revealed *Mycobacterium tuberculosis* in the urine sample. A chest x-ray and sputum acid fast bacilli (AFB) examination indicated pulmonary tuberculosis. The patient was treated with standard anti-tuberculosis drugs for 6 months, resulting in clinical improvement. **Discussion:** Diagnosing genitourinary TB is challenging due to its nonspecific presentation and the limited sensitivity of routine urine microscopy. While Xpert MTB/RIF offers higher accuracy, its availability is restricted in many settings. LAM testing shows usefulness in HIV-associated TB, but its role in non-HIV genitourinary TB is still uncertain. Improved, accessible diagnostic strategies are needed for earlier detection. **Conclusion:** Genitourinary TB remains challenging to diagnose, particularly in rural areas with limited access to advanced diagnostics. A careful medical history, repeat urinalysis, and simple tests such as urine smear microscopy, LAM, and MTB/RIF can aid early detection. Early diagnosis is essential to prevent complications such as end-stage kidney failure.

Keywords: Case report, diagnosis, genitourinary tuberculosis, rural areas.

ABSTRAK

Pendahuluan: Tuberkulosis (TB) urogenital merupakan salah satu bentuk TB ekstraparu yang paling sering ditemukan, namun sering kali tidak terdiagnosis karena gejalanya yang kurang spesifik dan sering menyerupai infeksi saluran kemih berulang. **Kasus:** Seorang wanita berusia 27 tahun dirujuk ke rumah sakit dengan keluhan sering buang air kecil dan terasa nyeri sejak 6 bulan, disertai dengan demam hilang timbul dan batuk sesekali. Pasien telah diobati dengan beberapa antibiotik, tetapi gejalanya tidak membaik. Pemeriksaan laboratorium termasuk mikroskopis urin, antigen LAM, dan Xpert MTB/RIF menunjukkan *Mycobacterium tuberculosis* pada sampel urin. Pemeriksaan rontgen toraks dan BTA sputum menunjukkan infeksi tuberkulosis paru. Pasien diterapi dengan obat antituberkulosis selama 6 bulan dan mengalami perbaikan klinis. **Diskusi:** Diagnosis tuberkulosis genitourinaria sulit dilakukan karena gejalanya tidak spesifik dan sensitivitas mikroskopi urin rutin yang terbatas. Meskipun Xpert MTB/RIF memiliki akurasi yang tinggi, ketersediaannya masih terbatas di banyak fasilitas layanan kesehatan. Uji LAM menunjukkan kegunaan pada TB terkait HIV, namun perannya pada TB genitourinaria non-HIV masih belum pasti. Strategi diagnostik yang lebih terjangkau dan mudah diakses diperlukan untuk deteksi dini. **Simpulan:** Diagnosis TB urogenital masih menjadi tantangan terutama di daerah pedesaan dengan keterbatasan fasilitas diagnostik. Adanya riwayat medis yang cermat, pemeriksaan urin berulang, serta uji sederhana seperti apusan mikroskopis urin, LAM, dan MTB/RIF dapat membantu diagnosis dini dan mencegah komplikasi berat seperti gagal ginjal stadium akhir. **Teresa Asali, Feddy Setiady, Agung Ambara Putra, Harina Salim. Perempuan Berusia 27 Tahun dengan Tuberkulosis Urogenital: Masalah Diagnosis di Pedesaan Indonesia - Laporan Kasus.**

Kata Kunci: Laporan kasus, diagnosis, tuberkulosis urogenital, daerah pedesaan.

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INTRODUCTION

Tuberculosis (TB) is an infectious disease caused by bacteria *Mycobacterium tuberculosis.* TB primarily affects the lungs, but it can also involve other organs.[1] Mycobacteria are transmitted to humans in several different ways. The most common route of infection is from inhalation of aerosol droplets containing Mycobacteria. Other less common routes include ingestion of contaminated dairy products, congenital transmission, and sexual transmission.[2] Risk factors for TB include malnutrition, human immunodeficiency virus (HIV) infection, diabetes mellitus, smoking, alcohol consumption, and use of immunosuppressive drugs.[2,3]

According to the WHO Global Tuberculosis Report 2024, approximately 10.8 million people worldwide are infected with TB. Indonesia has the second-highest TB burden in the world, only behind India.[4] In 2022, an estimated 969.000 new TB cases were reported in Indonesia, with 19.586 cases in West Borneo.[5] In South-East Asia, 20% of all diagnosed TB cases present with extrapulmonary tuberculosis.[4] Common sites of extrapulmonary tuberculosis are lymph nodes, pleura, bones, meninges, and urogenital tract.[6]

Genitourinary TB is a Mycobacterium infection in the kidneys, ureters, bladder, prostate, urethra, epididymis, vas deferens, ovaries, fallopian tubes, uterus, cervix, vulva, or penis.[2] Genitourinary TB is often difficult to diagnose because of its varied manifestations. Symptoms range from asymptomatic to mild nonspecific symptoms such as flank pain, increased voiding, or suprapubic pain.[7] Constitutional TB symptoms, such as fever or weight loss, are uncommon, except when it presents with concomitant TB from another system.[8] Delay in diagnosis or treatment can be fatal, as it can lead to renal parenchymal destruction, ureteral stricture, obstructive nephropathy, or end-stage renal failure.[2]

CASE

A 27-year-old woman from Sintang Regency presented to the Emergency Department with complaints of frequent and painful urination for the past six months. She experienced intermittent pain in her left flank and suprapubic region. Additionally, she had intermittent fever and occasional cough for the last two months. She had lost approximately 10 kg in the past months. She was diagnosed with recurrent urinary tract infection and was treated with multiple antibiotic regimens over the months, but the symptoms did not resolve. Physical examinations revealed a body weight of 38 kg and a height of 150 cm, with a BMI categorized as underweight. On examination, her general appearance was moderately ill. Her blood pressure was 115/80 mmHg, and she had a mild fever with a temperature of 37.8 ° C. Suprapubic tenderness and left costophrenic angle knocking pain were also noted.

Laboratory analysis revealed haemoglobin of 9.9 g/dL, white blood cell count of 14.11 x 10^{3}/µL with neutrophilia (86.8% leucocyte), and platelets at 356,000. Serum creatinine levels were within normal limits. Serum serology tests showed a negative reaction for anti-HIV. Urinalysis demonstrated a urinary pH of 6.0, leucocytes +1, protein +2, blood +3. Urine microscopy smear with Ziehl-Neelsen staining found +1 for acid fast bacilli. LAM (Lipoarabinomannan) antigen testing was positive in the urinary sample **(Figure 1C).** Xpert MTB/RIF (Mycobacterium tuberculosis/Rifampicin) testing of the urine sample detected *Mycobacterium tuberculosis* with no rifampicin resistance. A urine culture was also performed and yielded negative results for pyogenic agents.

Based on the history of illness, clinical presentation, laboratory investigations, and imaging findings, the patient was diagnosed with genitourinary tuberculosis. She was admitted to improve her general condition and complete further diagnostic examinations. Chest x-ray showed infiltrates in both lungs, indicating active pulmonary TB lesions, confirmed by sputum microscopy with Ziehl–Neelsen staining on two separate occasions **(Figure 1A, 1B).**

She was prescribed 4FDC (fixed drug combination), three tablets per day during the two-month intensive phase, followed by 2 FDC for the four-month continuation phase. After six days of hospitalization, her symptoms improved, and she was discharged. She was advised to continue her TB medication for a total of six months. After 6 months of anti-tuberculosis medication, the patient felt that her symptoms had improved.

DISCUSSION

Genitourinary TB is the second most common form of extrapulmonary TB.[4,9] The primary infection originates from inhalation of *Mycobacterium tuberculosis* bacilli. Macrophages in the alveoli engulf the bacteria, triggering a complex array of immune system responses. This reaction either eliminates the bacteria or contains them

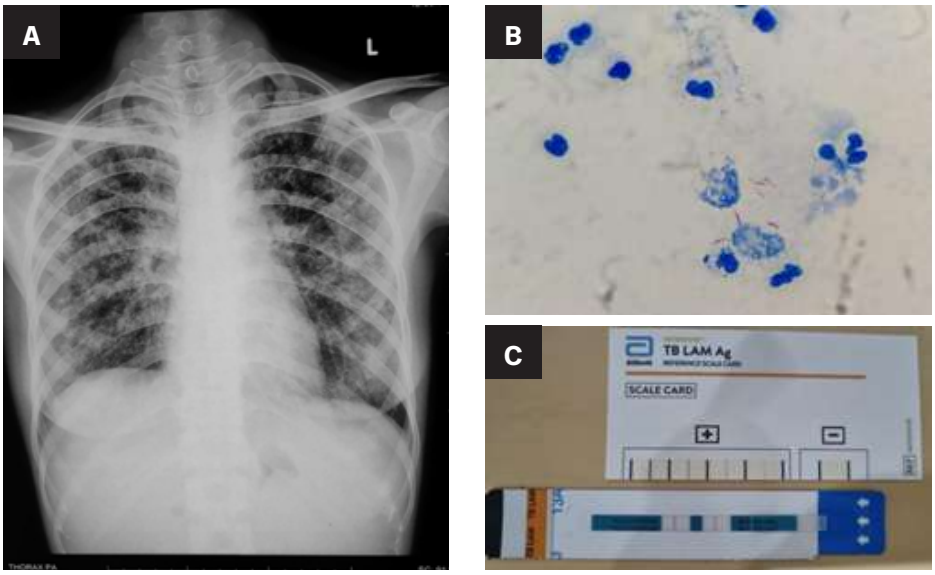

*Photo documentation by Teresa Asali.

Figure 1. (A) Chest x-ray showed infiltrates in both lung fields, indicating active pulmonary TB lesions; **(B)** Urine smeared with red staining in urine Ziehl-Nielson staining; **(C)** LAM antigen test with positive result.


through the formation of a primary granuloma (Ghon focus).[2] The Mycobacteria replicate very slowly, approximately every one to three days inside the macrophages.[10] If the bacteria evade the immune system during the primary infection, it can then spread to various tissues via the bloodstream or lymphatics.[1]

The kidneys are the most common sites of genitourinary TB, mainly because of their high vascularization.[2] The Mycobacteria spread from the primary focus in the lungs or gut to the kidneys via hematogenous dissemination. However, these primary infections do not immediately cause disease. Symptoms and signs typically take 12 months to two years to manifest.[2] Active kidney infection often leads to further infection in ureter and bladder as Mycobacteria enter the urine. Infection in other parts of the genitourinary system, such as the prostate, epididymis, or female reproductive organs, typically results from hematogenous spread rather than descending infection.[9] However, primary genital tuberculosis in female can occur through sexual intercourse with a male who has genital TB.[11]

Genitourinary TB is often asymptomatic but may present with symptoms such as hematuria, sterile leukocyturia, an increase in urinary frequency, dysuria, abdominal, lumbar, and suprapubic pain, and, in female patients, menstrual irregularity and pelvic pain.[12] A detailed patient history is crucial for diagnosing genitourinary TB. Persistent urinary tract infections that do not respond to antibiotics can be highly suggestive of genitourinary TB.[9] Because it can mimic various diseases in the urinary tract, diagnosis is often delayed.[12] Delay in diagnosis can potentially lead to complications such as renal parenchymal destruction, ureteral stricture, obstructive nephropathy, or end-stage renal failure.[2,12]

Diagnosis and clinical evaluation of genitourinary TB have to be comprehensive. The initial suspicion should be based on the patient's clinical history.[9] Preliminary investigations for extrapulmonary TB include the tuberculin skin test or an interferon-gamma release assay (IGRA). However, neither test can distinguish between active and latent TB infection, limiting their usefulness in diagnosing active cases.[2,13]

The simplest and cost-effective method for detecting acid-fast bacilli is smear microscopy using Ziehl-Neelsen staining. This method has been the first-line diagnostic test for pulmonary TB for the past 70 years, but it is less effective for genitourinary TB.[2,12] Urine smear microscopy has low sensitivity (ranging from 0%–25%)[12,13] and cannot differentiate *Mycobacterium tuberculosis* from *non-tuberculous Mycobacteria.*[13]

In recent years, the World Health Organization (WHO) has recommended the use of the Xpert MTB/RIF test for diagnosing genitourinary TB. The Xpert MTB/RIF test is a nucleic acid amplification test based on the GeneXpert platform. This test has high sensitivity and specificity.[14] However, it is expensive and requires highly sophisticated equipment. Culture of three midstream first-void urine samples on consecutive days remains the reference standard for isolating *Mycobacterium tuberculosis*. However, it takes 9–10 days for a positive result to appear, and up to six weeks to confirm a negative sample. Cultures require advanced laboratory facilities and are time-consuming.[12] Imaging modalities such as intravenous urography, ultrasound, computed tomography (CT), and magnetic resonance imaging (MRI) also provide valuable diagnostic information. However, the findings vary depending on the location of infection, the aggressiveness of the disease, and the patient's immune system response.[15]

Lipoarabinomannan (LAM) is a component of the *Mycobacterium tuberculosis* cell wall. Mycobacteria produce LAM as defense mechanism against the human immune system.[16] The WHO has suggested the use of LAM as a diagnostic tool, particularly for TB in HIV-infected individuals with low CD4 count.[14] LAM antigen is present at the site of infection, circulates in the bloodstream, and is excreted in soluble form in urine. Urine samples are easy to collect and serve as an alternative for patients who cannot produce sputum.[16] However, the urinary LAM lateral flow assay (LFA) has low sensitivity (48%) and specificity (89%)[17] because anti-LAM antibodies could cross-react with nontuberculous mycobacteria.[16] Studies suggest that LAM antigen testing has higher sensitivity and specificity in patients with HIV co-infection compared to those without.[14,18] A study by Janneke, *et al*., found that LAM LFA in HIV-infected individual with renal TB had a sensitivity of 81% and specificity of 100%.[18]

Diagnosis of genitourinary tuberculosis was suspected in this case, based on the patient's history. Urine microscopy using Ziehl-Neelsen staining, and LAM antigen testing yielded positive result. Subsequent Xpert MTB/RIF testing on the urine sample detected *Mycobacterium tuberculosis.* We suspect pulmonary TB as the primary infection site, confirmed by chest x-ray and sputum smear microscopy.

Diagnosing genitourinary TB is challenging, and misdiagnosis is common. Xpert MTB/RIF testing of urine remains the primary diagnosis tool; however, it is expensive and requires sophisticated equipment. In community health centers or facilities without access to the GeneXpert platform, diagnosis relies on patient history and urine smear microscopy. LAM LFA has demonstrated higher sensitivity and specificity than urine smear microscopy in HIV-infected genitourinary TB.[12] However, WHO does not currently recommend LAM LFA for diagnosing TB in non-HIV-infected patients.[14] We have not found any study that uses LAM TB as a diagnostic tool for isolated non-HIV genitourinary TB; further research to evaluate LAM LFA as a diagnostic tool for genitourinary TB is recommended.

The first-line treatment for drug-sensitive genitourinary TB is similar to that of pulmonary TB. The standard regimen consists of six months of treatment: an initial two-month phase with a fixed-doses combination of isoniazid, rifampicin, ethambutol, and pyrazinamide, followed by a four-month continuation phase with isoniazid and rifampicin. Dose modifications are recommended for patients with renal impairment. Surgical intervention is only advised for patients with complications resulting from sequelae of genitourinary TB.[19]

CONCLUSION

Genitourinary TB is a common type of extrapulmonary TB, but is frequently misdiagnosed due to its nonspecific symptoms. Genitourinary TB can lead to end-stage renal failure if not diagnosed early


and treated properly. In areas with limited diagnostic modalities, past medical history and laboratory examination, such as urine microscopy smear with Ziehl-Neelsen stain, MTB/RIF test, and LAM can be considered for the diagnosis of urogenital TB. Early detection is essential to ensure timely treatment and prevent complications.

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