

## DIAGNOSTIC DELAY IN RENAL TUBERCULOSIS

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### ABSTRACT

**Introduction:** Tuberculosis (TB) of the urinary system is the second most common after pulmonary system. Urinary tuberculosis can mimic a number of diseases, hence its diagnosis is not very easy. A case is presented here where only after repeated investigations was the suspicion of renal tuberculosis aroused and diagnosis established by laboratory and imaging investigations.

**Materials & Methods:** A 35 year female Afghan patient with fever and recurrent lower urinary tract symptoms was admitted to Rehman Medical Institute (RMI) hospital in first week of September 2013. She had sterile pyuria not responding to usual antibiotics. Centrifuged deposit of her early morning urine upon microscopy showed a number of Acid Fast Bacilli after Ziehl-Neelson (ZN) staining. *Mycobacterium tuberculosis* was grown on solid Lowenstein-Jensen (L-J) medium and detected in liquid Mycobacterium Growth Indicator Tube (MGIT) medium. The strain was confirmed by TB Identification kit. Ultrasound showed hydronephrosis; ureteroscopy picked up suspected tubercular lesions in ureters and renal pelvis, hence she was stented and started on anti-TB medication.

**Results:** Upon follow up, marked improvement was observed.

**Conclusions:** Tuberculosis of the urinary tract should strongly be considered in patients with recurrent Urinary Tract Infections (UTI) and sterile pyuria not responding to antibiotics. The signs and symptoms of renal tuberculosis mimic those of other renal infections.

**Keywords:** Tuberculosis, Renal; Tuberculosis, Urogenital; *Mycobacterium tuberculosis*; Urinary Tract Infections.

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### INTRODUCTION

Tuberculosis (TB), caused by *Mycobacterium tuberculosis*, is a global health problem with an estimated 9.6 million new cases in 2014.

Pakistan currently ranks 5<sup>th</sup> amongst TB high-burden countries and the 4<sup>th</sup> in Multi Drug Resistant (MDR) tuberculosis globally. The annual incidence of TB in Pakistan is 231/100,000 within the estimated population of 180 million, producing 420,000 new cases annually.<sup>1</sup> The bulk of the cases occur in Asia and Africa.<sup>1</sup>

Usually, TB affects the lungs (pulmonary system), but can cause extra-pulmonary tuberculosis in other tissues or systems of the body including the genitourinary system. Tuberculosis of the urinary system is the second most common after pulmonary system. TB bacilli reach the kidney via the blood stream from a primary site, after which caseation slowly destroys the renal parenchyma. Only when the disease has eroded into the renal calyces, bacilli spread in the urine down to the ureter and bladder, infect them, and cause frequency and pyuria.

Early signs and symptoms may be mild or none, but can include those found in infections of the kidney, lower urinary tract, tubulointerstitial nephritis, glomerulonephritis, secondary amyloidosis, and obstructive uropathy.<sup>2</sup> A ureter that drains a tubercular kidney is loaded with bacilli, and becomes thick, fibrosed and strictured, usually in its lower third. Above this, the urinary tract dilates to form a hydro- or pyonephrosis. HIV infection and increased organ transplants have resulted in higher frequency of extra pulmonary tuberculosis.<sup>3</sup> About 27% of all extra-pulmonary tubercular infections are urogenital; the reason might be a disseminated infection or a local genitourinary disease.<sup>4</sup> Urogenital tuberculosis is mostly prevalent within the age group of 25 to 40 years, but rare in children.<sup>5</sup>

Urinary tuberculosis can mimic a number of diseases; hence its diagnosis is not very easy.

Patients with recurrent urinary tract infection and sterile pyuria unresponsive to intravenous antibiotics or those who lack immunity or those in TB endemic area should be suspected for urinary tuberculosis.

Presentation of urogenital tuberculosis may vary from vague urinary symptoms to chronic kidney disease.<sup>6</sup> Investigations such as routine urine examination, routine culture, complete blood count and ultrasonography of urinary tract give the initial diagnostic clue, but can be confirmed by culture of Acid Fast Bacilli (AFB), Polymerase Chain Reaction (PCR) for bacterial genome, and histopathological examination of tissue biopsies.

The treatment includes Isoniazid, Rifampicin, Pyrazinamide, Ethambutol and Streptomycin. On occasion surgical intervention might be required as an adjuvant to medical therapy. Any obstructive lesion needs early detection and intervention to save infected tissue/organ. Relapse after initial cure is also reported in few cases.<sup>2,7</sup> So close follow-up and monitoring should be continued throughout the treatment period and also for few years afterwards.

## CASE REPORT

A 35 year female Afghan patient presenting with fever and recurrent lower urinary tract symptoms of dysuria and frequency of urination for a week, was admitted to Rehman Medical Institute (RMI) hospital in the first week of September 2013. She had lower abdominal pain for a month; repeated courses of antibiotics were not effective. Upon physical examination, her temperature was 100°F, she had anemia and lower abdominal distention. No history of weight loss, night sweats or contact with tubercular patient was noted. She had numerous pus cells in her urine upon routine microscopy and albumin in traces. Her ESR was 75 mm/hour and CRP ranged between 5.31 to 7.64 mg/dl. Urea and creatinine were normal. Her chest X-ray was normal. Early morning

urine specimens were cultured twice to grow any usual urinary bacterial pathogens, but without success. No response was observed upon administration of antibiotics either.

Clinical suspicion was in favor of renal tuberculosis. A centrifuged deposit of the urine sample was stained with Ziehl-Neelsen (ZN) stain which showed a number of Acid Fast Bacilli. The specimen was cultured on selective solid Lowenstein-Jensen (L-J) medium & into the 7 ml liquid Mycobacteria Growth Indicator Tube (MGIT) containing modified Middlebrook 7H9 medium for rapid detection of *Mycobacterium tuberculosis*. *Mycobacterium tuberculosis* was not only grown on solid L-J medium, but detected in liquid MGIT medium too. *Mycobacterium tuberculosis* was confirmed by TB identification kit (BD). Diagnosis of urinary tuberculosis was further facilitated by Ultrasound which showed hydronephrosis. Ureteroscopy picked up suspected lesions in the ureter and renal pelvis; hence patient was stented & started on anti-TB medication. Upon follow up, marked improvement was observed.

## DISCUSSION

The usual presenting symptoms of tuberculosis include fever, weight loss and night sweats. In urinary tuberculosis however, these symptoms are nonspecific. These include back, flank and supra pubic pain, hematuria, pyuria, increased urinary frequency and nocturia, which may also indicate a conventional bacterial urinary tract infection.<sup>8</sup> The most common amongst these symptoms of renal TB at presentation are storage symptoms (urgency, frequency), dysuria, and hematuria, affecting 50.5%, 37.9%, and 35.6% of cases, respectively.<sup>9</sup> One or more of the above symptoms may be present.

Fever and pain were the other clinical features in this female Afghan patient. In comparison, two case reports of renal tuberculosis, one with fever and a pain in the right loin in a 63 year old

female, and the other in a 53 year old male with recurrent hematuria and left loin pain has been reported from China with markedly different clinical manifestations.<sup>10</sup> Fever and dysuria in another study of 31 subjects with urogenital tuberculosis in Nigeria were 51.6% and 22.6% in comparison. Others had back, loin or abdominal pain/tenderness.<sup>11</sup>

Urinary tuberculosis in this Afghan female patient was diagnosed when AFB were detected in centrifuged deposit of her urine specimen upon microscopy after ZN staining. Urine smear for AFB in patients with renal involvement during pulmonary tuberculosis remains positive in 50% of cases, if repeated (3 to 5) early morning urine specimens are examined microscopically. Upon culture for tubercle bacilli, 80-90% of such cases remain positive.<sup>12,13</sup>

In another study in Brazil, 7.5% of the cases had no lesions or there were minimal lesions on radiographic examination.<sup>14</sup> TB was diagnosed when bacilli were shown in the urine specimen only, unlike the one in this case report, where Ultrasonography showed hydrouretero-nephrosis; the patient underwent ureteroscopy, which showed tuberculous lesion in ureter and renal pelvis. Renal/ kidney biopsy is an invasive

procedure, was not required and therefore, not done in this patient either.

A urine culture from an old lady in Bangladesh with painless microscopic hematuria and presenting lesion of Erythema nodosum on her legs upon culture on special media yielded growth of *Mycobacterium tuberculosis* like the one in our case report.<sup>15</sup>

In one case report on urinary tuberculosis in a child,<sup>5</sup> the culture for urinary tuberculosis was negative with the stated reason of a technical problem in isolation or the initiation of anti-tubercular treatment earlier. In addition to the para-clinical finding in this patient, kidney abnormalities and dilation of ureter were also reported in renal tuberculosis by sonography.<sup>6,7</sup> Renal abnormalities like hydro-uretero-nephrosis were also detected by ultrasound in the current case report.

The treatment of all forms of urinary tuberculosis is similar to the treatment of pulmonary tuberculosis.<sup>8</sup>

## CONCLUSION

A high index of suspicion for Urogenital Tuberculosis is warranted in patients presenting with repeated complaints related to the urinary tract that are not responding to routine management measures.

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Submitted for Publication: June 15, 2016

The authors have no conflict of interest. All authors contributed substantially to the planning of research, questionnaire design, data collection, data analysis and write -up of the article. The authors agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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This article may be cited as:

Zai S, Amirzada P, Naveed M, Waseem M. Diagnostic delay in renal tuberculosis. (Case Report). *J Rehman Med Inst.* 2016 Apr -Jun;2(2):47-50.

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