Introduction

Tuberculosis is one of the most common causes of death due to infectious disease, with at least nine million new cases worldwide and two million deaths per year. Around 95% of these cases occur in developing countries. Genitourinary tuberculosis is reported 20%-70% from all cases of extra-pulmonary tuberculosis, but rarely found in children. This is the second most common form of extra-pulmonary tuberculosis after peripheral lymphadenopathy. This study reported a rare case of genitourinary tuberculosis in 2-year-old Indonesia boy with malnutrition.

Case presentation

A 2-year-old Indonesian boy had acute febrile illness due to recurrent urinary tract infection. He experienced intermittent fever for two months, took antipyretic, and was circumcised but the fever did not resolve. His brother and aunt suffered from lung tuberculosis and were treated on treatment for 3 months. Abdominal ultrasonography (USG) revealed right hydrenephrosis grade II, with chronic parenchymatous renal disease. USG Doppler showed discrepancy in flow velocity of right and left renal, suggesting renal artery stenosis or anatomical pathology (hydro-nephrosis). Laboratory analysis revealed hemoglobin (10.6 mg/dL), white blood cell (17.460/mm³) with monocytois (7.6%), platelet (822,000), normal ureum and creatinine levels. Tuberculin test (2IU) was 15 mm of induction in diameter. Chest radiogram showed military tuberculosis (Fig. 1A). In Indonesia, diagnosis of pediatric tuberculosis is based on TB scoring ≥6. The patient’s score was 7, including severe malnutrition, positive tuberculin test, abnormal chest X-Ray, and history of fever >2 weeks. Abdominal ultrasonography (USG) revealed right hydro-nephrosis grade II with chronic parenchymatous renal disease (Fig. 1B). USG Doppler showed discrepancy in flow velocity of right and left renal, suggesting renal artery stenosis or anatomical pathology (hydro-nephrosis and parenchymatous renal disease). Microscopy examination was positive for acid-resistant bacilli by using Ziehl-Neelsen method (Fig. 1C). Intravenous pyelography (IVP) showed moderate dilatation of the right kidney (Fig. 2). USG and IVP were conducted at different times. Urinalysis revealed cloudy urine with proteinuria (+2), leukocytosis (+3, 2521/hpf), bacteriuria, hematuria (+3, 258/hpf) eumorphic. Voiding cystourethrogram revealed right vesicoureteral reflux grade III-IV (Fig. 3). All relative findings indicated genitourinary tuberculosis.

The initial therapy for patients included oral anti-tuberculosis to eradicate tuberculosis bacteria, symptomatic therapy for pain treatment, and nutrients for the management of severe malnutrition marasmus. Patients received children FDC (fixed drug combination), 2

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tablets per day with ethambutol 200 mg per day during the intensive phase for two months, followed by 10-month maintenance phase. Patient also received prednisone 5 mg three times a day for 4 months then tapering off. Nutritional therapy complied with the recommended dietary allowance of age-appropriate for the calorie and protein, and Halliday Segar’s formula for fluid needs. Patients received WHO formula (F75, F100, F135) to meet the needs of macronutrients, which were equipped with micronutrients such as vitamin A, vitamin B complex, Vitamin C, Vitamin D, Vitamin E, Folic Acid and Zinc.

Serial urinalysis during hospital treatment showed no significant improvement in hematuria, leucocyturia and bacteriuria during the first month. Preparation of direct smear staining of urine with acid-resistant bacteria obtained a decrease in the number of acid-resistant bacteria within one week of treatment. The patient was planned for ureteric stenting but refused.

Discussion

Genitourinary tuberculosis is rare in children. There is often a long latent period (5–40 years) between the original pulmonary infection and...
the appearance of clinical renal disease, which causes rare renal improvement before the age of 20. Another reported case of urinary tract tuberculosis in children was 2 year old.\textsuperscript{2}

Mycobacterium can reach the kidneys hematogenously. These bac
teria can also be found in the urine in miliary tuberculosis and in some cases of pulmonary tuberculosis with no lesions in the renal paren
chyma. Especially in urinary tuberculosis, voiding problems and chronic urgency non-responding to antibacterial drug regimens, are indicative of genitourinary tuberculosis.\textsuperscript{3}

A combination of positive culture or histological analysis of biopsy specimens with polymerase chain reaction is still required in most pa
tients for a definite diagnosis. Detection of acid-fast bacilli from urine samples by microscopy (Ziehl-Neelsen acid fast stain) is not reliable due to possible presence of mycobacterium smegmatis, which are acid-fast bacilli. The biological activity of tuberculosis can only be assessed by cultivating mycobacteria. The most common laboratory abnormalities are pyuria, albuminuria and hematuria in kidney disease cases. Renal tuberculosis is accompanied by manifestation of the urinary syndrome in 70.4% of cases and the presence of Mycobacteria tuberculosis in 100% of cases.\textsuperscript{4}

According to the WHO, anti-tuberculous drug treatment is based on an initial 2-month intensive phase of treatment, and followed by a 4-month continuation phase. In the continuation phase, the drug may be given twice or thrice weekly. Reconstructive surgery, mainly repairing strictures at the lower end of the ureter, and bladder augmentation for a small fibrotic bladder is frequently required. Both radical and recon
structive surgery should be carried out in the first 2 months of intensive chemotherapy. Early ureteric stenting or PCN in patients with
tuberculous ureteral strictures may increase the opportunity for later reconstructive surgery and decrease the likelihood of renal loss.\textsuperscript{5}

The child’s bladder does not appear to be much contracted because of short duration of disease. Bladder contraction is usually caused by slow progressive infection without proper treatment that is clinically inapparent for decades.

Conclusions

A 2-year-old Indonesian boy with genitourinary tuberculosis confirmed by history of recurrent urinary tract infection, marasmic presentation, family history of tuberculosis. Radiological work-ups showed pulmonary miliary tuberculosis, also complication hydrop
nephrosis and ureteral kinking. Centrifuge-urine smear showed acid
resistant bacillus. He was treated with anti-tuberculosis regiments and showed improvement on clinical presentation. This patient should un
dergo reconstructive surgery but refuse.

Statement of ethics

The parent or legal guardian were fully informed about the purpose of the study and provided written informed consent. The present case report adhered to the Declaration of Helsinki.

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None.

Author's contribution

All authors contributed toward data analysis, drafting and revising the paper, gave final approval of the version to be published and agree to be accountable for all aspects of the work.

Declaration of competing interest

Astrid Kristina Kardani and Krisni Subandiyah declare that they have no conflict of interest this publication.

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