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## Renal Tuberculosis in a Four-Year-Old Child

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### ABSTRACT

*Tuberculosis of the genitourinary tract is one of the late reactivation or complications of pulmonary tuberculosis which is mostly prevalent in young adults and middle-aged people. Renal tuberculosis is rare in children. We present a 4 year-old Afghan girl suffering from pulmonary and renal tuberculosis. The child presented to the hospital with severe malnutrition, fever and cough which initiated a month earlier. She had a history of close contact with her mother who was a smear positive TB patient. Radiologic findings in her chest x-ray were pulmonary infiltration in the right lower lobe along with right hilar adenopathy. The diagnosis of pulmonary tuberculosis was made based on the systemic and pulmonary signs and symptoms as well as the bacteriologic examinations. Anti-tuberculosis drugs were given to the child and after obtaining intravenous pyelography (IVP), voiding cystourethrogram (VCUG) and kidney CT-scan; the diagnosis of renal tuberculosis in addition to pulmonary tuberculosis was made. Urinary symptoms were treated by anti-tuberculous therapy. (Tanaffos 2006; 5(4): 71-74)*

**Key words:** Tuberculosis, Renal tuberculosis, Children

### INTRODUCTION

Urogenital tuberculosis is rare in children and is mostly prevalent in the age range of 25 to 40 years (1). It is difficult to estimate its incidence and prevalence because in most patients, the disease remains asymptomatic for a long time. Generally, genitourinary tract is infected in 20 to 73% of extra pulmonary tuberculosis. According to some studies, the incidence of urogenital tuberculosis is estimated to comprise 24% of extra-pulmonary TB cases in Germany and 5% in the UK (2).

According to CDC (Center for Disease Control) report, genitourinary tuberculosis comprises 12% to

18% of extra pulmonary tuberculosis (2).

Although in the last 15 years, prevalence of TB has decreased, it seems that the drug-resistant species are increasing. Also, prevalence of extra pulmonary TB is increasing in the recent years especially in immunosuppressed patients such as those with AIDS (1). In this article, a 4-year-old child with renal tuberculosis is reported.

### CASE REPORT

The patient was a 4-year-old Afghan girl who had cough, weight loss and fever which initiated a month prior to admission. The mother of the child had also been hospitalized in this center with the diagnosis of smear-positive pulmonary tuberculosis. At the time of admission, the child was suffering from a severe malnutrition (growth percentile below 3%). No

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pathologic finding was detected during systematic examination. Considering the presence of clinical signs and symptoms as well as the history of contact with a tuberculosis source, the child was hospitalized to be evaluated for pulmonary tuberculosis. Gastric lavage was examined 3 times for presence of acid fast bacilli (AFB) which was negative. Tuberculin test was negative as well. Examination of the gastric fluid for MTB by PCR was also negative.

On chest radiography, infiltration of the lower lobe along with hilar adenopathy was seen in the right lung. Based on the history of close contact with her mother, clinical and radiologic findings compatible with the diagnosis of smear negative pulmonary tuberculosis, anti-tuberculosis treatment was started (2HRZE/4HR).

Hematuria and sterile pyuria were detected by testing the urine. The child underwent renal sonography which revealed an ectasia in the upper pole of the left kidney. Voiding cystourethrogram (VCUG) was normal. Intravenous pyelography (IVP) showed dilation of right pyelocaliceal system (Figure1).



**Figure 1.** Intravenous pyelography of the patient.

Coagulation profile and the number of platelets were within the normal range. C3, C4 and CH50 were negative. Morning urine smear was taken 3 times and examined for AFB which was negative.

Examination of the urine for MTB by PCR and culture was negative. Considering the above mentioned clinical and paraclinical signs and symptoms as well as the diagnosis of renal tuberculosis, the anti-tuberculous treatment was continued. Urine analysis became normal, 1.5 months after initiation of treatment. Both hematuria and sterile pyuria improved after anti-tuberculosis therapy. The tuberculin test performed 1.5 months after initiation of treatment resulted in a 25-mm induration.

The child gained 2 kilograms during this time period and her general condition improved significantly.

## **DISCUSSION**

Renal tuberculosis is a secondary tuberculous infection which is caused due to the hematogenous dissemination during primary infection or reactivation. The cortex of the kidney is an appropriate place for lodging of bacilli since the rate of oxygenation is high.

Afterwards, the infection is transmitted from the cortex to the medulla and numerous tubercles will form. At this point, cell-mediated immunity (CMI) will stop bacilli proliferation and fibrous tissue and then scar will form. But different causes such as stress, old age, immune deficiency, etc. will cause reactivation (2, 3, 5). In our patient, severe malnutrition (growth chart below 3%) and young age, were the predisposing factors for the severe reactivation of tuberculosis. Renal tuberculosis occurs concomitantly with the active pulmonary tuberculosis in 40% of cases and with silent

pulmonary tuberculosis in 60%. In this patient, respiratory symptoms and presence of pulmonary infiltration the chest x-ray confirmed the diagnosis of pulmonary tuberculosis concomitant with renal tuberculosis.

Sterile pyuria is the most common clinical finding and usually at this point, severe dissemination of bacilli and the resulting necrosis have occurred. Hematuria, flank pain, dysuria and sometimes involvement of other parts of the genitourinary system such as the epididymis or bladder are also reported. Severity of the bladder infection correlates with the severity of kidney infection. But the involvement of bladder is by far more scarce in children than adults (1, 4).

The main paraclinical finding in our patient was the sterile pyuria associated with hematuria which was suggestive of renal tuberculosis considering the tuberculosis of the patient.

According to several studies, in case of renal involvement during pulmonary tuberculosis, urine smear will be positive for AFB in 50% of cases if performed on morning urine samples within 3 to 5 consecutive days. In this manner, urine culture will be positive in 80-90% of cases (2, 5). In our patient, bacteriologic examination was negative. The reason might be a technical problem in isolating the bacilli or initiation of the anti-tuberculosis treatment before the paraclinical examinations begin.

The positive paraclinical finding in this patient was kidney abnormalities revealed on sonography and IVP as caliectasis and dilation of the right pyelocaliceal system which are the common changes reported in renal tuberculosis (6, 7). The treatment of all forms of extra-pulmonary tuberculosis is similar to the treatment of pulmonary tuberculosis (8). In this patient a 6-month treatment course according to the WHO protocol was started as 2HRZE/4HR. After 1.5

months, urine analysis indicated that sterile pyuria and hematuria have improved which confirmed the primary diagnosis as well as the proper therapeutic response.

Another diagnostic method is renal biopsy and a pathologic finding in favour of TB, which was not performed in this child.

According to the reports from the world, renal tuberculosis is extremely rare in children (9). It has not been reported in children younger than 5 years. In the year 1997 in India, 9 children with renal tuberculosis in the age range of 5 to 12 years were reported. Gross haematuria was the common clinical finding in these children (10, 11).

This report was the first case of renal tuberculosis in a child under 5 years of age in Iran. We recommended to consider renal involvement in case of presence of sterile pyuria and/or hematuria in a child suffering from pulmonary tuberculosis.

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