Pediatrics

Renal Tuberculosis in a 9 Months Old: Case Report and Review of the Literature

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A B S T R A C T

A nine months old girl with prenatal diagnosis of bilateral hydronephrosis underwent serious studies and in view of the presumed diagnosis of right functional annulment, a right laparoscopic nephroureterectomy was performed. The anatomopathological result was suggestive of tuberculosis without previous contact with the disease. Postoperatively, the child received antituberculosis therapy (ATT) for a full 8 months (isoniazid, rifampin, pyrazinamide and ethambutol for 2 months and isoniazid and rifampin for 6 months) and the follow-up tests revealed improvement of ureterohydronephrosis in left kidney.

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Introduction

Genitourinary tuberculosis (TBC) accounts for 14–41% of all cases of pulmonary TBC in developed countries. It also represents a complication in 3–4% pulmonary TBC cases that usually occurs 5–15 years after primary pulmonary infection. Despite its status as the most common form of genitourinary TBC, renal TBC is very rare and under-recognized in the pediatric population.

Case report

A nine months old girl was referred to the pediatric department with prenatal diagnosis of bilateral hydronephrosis and dilatation of right ureter due to a bilateral double system associated to bilateral megaureter. She was otherwise healthy and asymptomatic. The general examination was unremarkable.

The serial urine microscopy showed more than 100 leukocytes per ml and the cultures resulted positive for Klebsiella oxitoca. Serum investigations were normal. Renal ultrasonography showed bilateral double system with bilateral megaureter associated to hydronephrosis of superior hemisystem and parenchyma atrophy more significant in the right kidney. Filling cistourogram showed right vesicoureteral reflux (VUR) to the lower right hemisystem and intravenous urography did not disclose further findings (Fig. 1). Diuretic renogram revealed an important difference in renal function: right kidney 6% and left kidney 94% (Fig. 2).

In view of the presumed diagnosis of right functional annulment, a right laparoscopic nephroureterectomy was performed and the anatomopathological result was chronic granulomatous pyelonephritis suggestive of tuberculosis. The patient had no suffered from TBC in the past nor contact with a patient suffering from TBC. Immunization with Bacillus Calmette-Guerin (BCG) had not been administrated.

With the histopathologic diagnosis of renal TBC (Fig. 3) the patient was subjected to further investigations. The chest CT presented with lesions compatible with lung TBC, Mantoux test showed a mildly positive reaction (15 mm induration) and urine PCR was positive for Mycobacterium tuberculosis. The patient’s mother was also studied and had no evidence of disease.

Postoperatively, the child received antituberculosis therapy (ATT) for a full 8 months and the follow-up renal ultrasonography and urography revealed improvement of ureterohydronephrosis in left kidney.

Discussion

Genitourinary TBC is usually a secondary tubercular infection which is caused by hematogenous dissemination during primary infection or reactivation into the glomerular arterioles forming cortical microabscesses that can progress to cavitory lesions in the renal papillae. It represents the second most common
extrapulmonary manifestation of TBC after cervical lymphadenopathy, and is most commonly encountered between the second and fourth decade of life representing less than 5% of pediatric extrapulmonary cases worldwide. However, in some case series of renal tuberculosis in children the age of presentation was typically between 5 and 11 years with a latent interval between primary TBC infection and the diagnosis of renal TBC ranging from 2 months to 4 years. Even so, it is unlikely to see the disease in a child younger than 5 years. That means that is very infrequently reported in the literature.1 In the current case, the assumed route of infection could not be ascertained as there was no evidence of active TBC among family members and the case did not meet the revised criteria for a diagnosis of congenital TBC described in some articles (proven tuberculosis lesion in the infant plus one of the following: lesions occurring in the first week of life, a primary hepatic complex, maternal genital tract or placental tuberculosis and exclusion of postnatal transmission by thorough investigation of contacts).

Patients with renal TBC are usually asymptomatic (44%), but when present symptoms these are dysuria (36%), hematuria (16%), sterile pyuria (50%), flank pain (9%), recurrent urinary tract infections and constitutional symptoms and hydroureretonephrosis.

The diagnosis can be confirmed with at least three consecutive early morning urinary cultures for acid fast bacilli (AFB) together with polymerase chain reaction (PCR) tests and a histopathology of tissue biopsy. Among the imaging studies, a computed tomography scan (CT) with intravenous contrast is able to provide most of the necessary information in abdominal TBC, raising our suspicion when demonstrate calcifications, pelvicalyceal dilatation and generalized thickening of the uroepithelium. Further
evaluations for congenital TBC include: ruling out immunodeficiency disorders such as HIV, Mantoux tuberculin skin test, chest X-ray, gastric lavage and endometrial biopsy of the child’s mother.

Renal TBC can be cured spontaneously (4–8%) or as a result of antitubercular therapy without surgical intervention. Fine needle aspiration cytology constitutes a recommended procedure to avoid surgical intervention that, on the other hand, should be indicated in lesions that fail to respond to 4–6 weeks of intensive chemotherapy, non-functioning kidneys or cases of extensive disease involving the whole kidney. Additionally, the interferon gamma release assay test (IGRA), which can detect \textit{M. tuberculosis} infection anywhere in the body, is considered a more effective diagnostic tool than a conventional tuberculin skin test. However, it is not usually carried out due to its lack performance data in pediatric population below 5 years of age.

The aforementioned medical treatment of renal TBC includes 2 months of intensive phase antitubercular therapy with isoniazid, rifampicin, pyrazinamide and ethambutol, followed by at least 4 months of continuation phase therapy with isoniazid and rifampicin. In only 3 months this treatment can achieve an 86.4% negativization of previous positive urinary AFB, mycobacterial cultures or PCR tests. Controversy exists over whether long-term multidrug antitubercular chemotherapy could achieve sterilization of the caseous lesions and make surgery unnecessary although in some series only 10% of non-functioning kidneys were managed to save. Besides, surgical treatment ensures removal of the infective pathology and decreases the chances of resurgence of the disease.

Conclusions

Renal TBC is a disease with preventable complications if timely diagnosis and treatment is established and so, in order to avoid outcomes such as renal failure, clinicians should be aware of the signs and symptoms of genitourinary TBC when treating when children with urinary problems, especially in countries with a high prevalence of TBC.

Close family members should be thoroughly investigated in cases of suspected congenital TBC to determine the source of infection and prevent further infections.

Preoperative diagnosis is recommended if the grade of suspicion is high in order to avoid the need for surgery.

Conflict of interest

There is no conflict of interest in the article.

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