Salmonella Typhi in a Child with Urinary Tract Infection and Urolithiasis

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INTRODUCTION

Typhoid fever is the most common illness caused by Salmonella typhi [1]. Other, less frequent manifestations include localized infections in soft tissue, bones, joints and genital tracts [2]. Few cases of salmonella urinary tract infection (UTI) have been reported in children. More than five cases of Salmonella typhi UTI reported in children and adults were associated with significant urolithiasis [3-4].

We report one more case of Salmonella typhi UTI in an 11-year-old female with right pyelocaliceal lithiasis on renal ultrasound and relevant discussion is presented.

CASE REPORT

An 11-year-old girl presented to the pediatric clinic because of fever, suprapubic pain, hematuria and dysuria. She had no back pain nor gastrointestinal symptoms. She complained of urinary tract infection symptoms six months earlier and was then treated empirically by amoxicillin. No family history of recent gastrointestinal symptoms was present.

Physical examination revealed a temperature of 39.5°C, and pain on palpation of the suprapubic area. Presumptive clinical diagnosis was urinary tract infection and the patient was treated with 2 grams amoxicillin daily for 5 days. Urine culture revealed over 100,000 colonies per ml of Salmonella typhi, sensitive to amoxicillin. Clinical improvement was noted soon after 48 h. A stool culture was not obtained. Ten days later, when she was no longer taking antibiotics, the patient came to the emergency department complaining of fever, urinary frequency and hematuria. Urinalysis again suggested infection with red blood cells and numerous white blood cells. The patient was admitted to the hospital for evaluation and treatment. Laboratory studies revealed hematocrit 32 percent, white blood cell count 10600/mm³, serum calcium 2.52 mmol/l, phosphorus 1.56 mmol/l, uric acid 239 mmol/l, creatinine 45 mmol/l, sodium 146 meq/l, potassium 4.6 meq/l. Urine culture grew again with Salmonella typhi. Stool and blood cultures were negative. A Widal test showed a titer of 1/1320 of S. typhi O antigen (latex method) and 1/80 against H antigen. Kidney ultrasound revealed the presence of a 2.5 mm microlithiasis in the right inferior pyelocaliceal system. After four days of treatment with IV ceftriaxone at 2 gm/day, a repeated urine culture returned negative and the patient was discharged with cefixime per os for ten days. Follow-up revealed no recurrence for Salmonella typhi in the urine during the next six months. Ultrasound of the kidneys revealed disappearance of urolithiasis without the need for surgical treatment neither lithotripsy.

DISCUSSION

Salmonella UTIs are unusual and occur most often in infants and those over 60 years [5]. Species most frequently isolated from urine include S. typhimurium, Heidelberg, enteritidis, infantis, Newport and typhi [5]. Salmonella has been postulated to enter the urinary tract either hematogenously or by direct invasion of the bladder via the urethra. In women, the short urethra is considered to be a primary risk factor [6]. Localized Salmonella typhi infections and especially urinary tract infec-
Bacteriuria of Salmonella is frequently associated with structural abnormalities of the urinary tract and by compromised immune function [8]. Nephrolithiasis, hydrenephrosis, anatomic abnormalities, schistosomiasis, tuberculosis and neoplasms of the kidney have all been reported as predisposing factors [8]. In children and adults more than 67 cases of nontyphi salmonella UTI have been reported [9-14].

Our patient had S. typhi UTI associated to urolithiasis. S. typhi was isolated from two urine culture at a time when she had pyuria and hematuria. She had a relapse despite appropriate treatment (stool and blood cultures were negative). It is frequently debatable whether the lithiasis has preceded a Salmonella chronic carrier state or whether it is secondary to UTI infection.

Melzer et al. reported 6 patients with clinically significant non Salmonella UTI associated with nephrolithiasis [3]. The authors concluded that the pre-existence of stones, deformities or local tissue damage predisposed to the development of chronic Salmonella infection of the kidney. In our case we believe that infectious calculi was the result of Salmonella typhi UT, since that she was not a chronic carrier state. The presence of urolithiasis was probably the cause of recurrent infection. Hasham and Uehling [15] reported a case of Salmonella lithiasis in a 60-year old woman. Nephrectomy was necessary to eliminate the carrier state. In his article he stated that in patients with Salmonella carrier state, bacilluria will not be permanently eliminated by treatment with antibiotics unless stones are removed, obstruction corrected or diseased renal tissue is resected.

In our case, Salmonella UTI resolved without removal of the stone which dissolved spontaneously. No urinary abnormalities were found and no suspicion of immunosuppressive status. Furthermore, adult and pediatric clinicians should look for nephrolithiasis in Salmonella urinary tract infection.

REFERENCES