

CAS CLINIQUE/CASE REPORT

SALMONELLA TYPHI IN A CHILD WITH URINARY TRACT INFECTION AND UROLITHIASIS

Chebl MOURANI¹, Georges HAGGE¹, Samir G. MALLAT², Ghassan CHEHAB¹, Mohammad A. SABBAH¹

Mourani C, Hagge G, Mallat SG, Chehab G, Sabbah MA. *Salmonella typhi* in a child with urinary tract infection and urolithiasis. *Leb Med J* 2005 ; 53 (4) : 234-235.

ABSTRACT : *Salmonella* species are a rare cause of urinary tract infections in children. They have been associated with a higher incidence of structural abnormalities or immunosuppressive status. We report the case of an 11-year-old girl with urinary tract infection (UTI) secondary to *Salmonella typhi* and associated with urolithiasis. A review of the subject is then discussed.

Mourani C, Hagge G, Mallat SG, Chehab G, Sabbah MA. *Salmonella typhi* chez un enfant présentant une lithiase associée à une infection urinaire. *J Méd Lib* 2005 ; 53 (4) : 234-235.

RESUME : Les salmonelloses sont une cause rare d'infection urinaire chez les enfants. Elles ont été associées à des anomalies structurales de l'arbre urinaire ou un état d'immunosuppression. Un cas d'infection urinaire secondaire à *Salmonella typhi* et associé à une lithiase urinaire est décrit chez une fille de 11 ans. Une revue du sujet est discutée.

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 amoxicilline 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, and 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-

Departments of ¹Pediatrics and ²Nephrology, Hôtel-Dieu de France Hospital, Beirut.

Correspondance to : Chebl Mourani, MD. Pediatric Department. CHU Hôtel-Dieu de France. POBox 16-6830. Beirut, Lebanon.

E-mail : mourani@inco.com.lb

tions are rare [7]. *S. typhi* can be isolated from urine following a recent episode of typhoid fever, or in chronic carrier states involving the urinary system, and occasionally following localized UTI due to *S. typhi* [1]. Bacteriuria of *Salmonella* is frequently associated to structural abnormalities of the urinary tract and by compromised immune function [8]. Nephrolithiasis, hydronephrosis, 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

1. Farmer J, Platin J, Kell MT. Enterobacteriaceae. In : Balows, Hausler Jr, Herrmann, Isenberg, and Shadomy, editors. Manual of Clinical Microbiology, 5th ed. Washington, DC : American Society for Microbiology, 1991 : 360-84.
2. Cohen JI, Bartlett JA, Corey GR. Extra intestinal manifestations of Salmonella infections. Medicine 1987 ; 66 : 349-88.
3. Melzer M, Altmann G, Rakowszyk M, Yosipovitch ZH, Barsilai B. Salmonella infections of the kidney. J Urol 1965 ; 94 : 23-7.
4. Mathai E, John TJ, Rani M et al. Significance of *Salmonella typhi* bacteriuria. J Clin Microbiol 1995 Jul ; 33 (7) : 1791-2.
5. Wilson R, Feldma RA. Salmonella isolates from urine in the United States, 1968-1979. J Infect Dis 1982 ; 146 : 293-6.
6. O'Grady F, Cattell WR. Kinetics of urinary tract infection. The bladder. Br J Urol 1966 ; 38 : 156-62.
7. Clyde WA Jr. Salmonellosis in infants and children : a study of 100 cases. Pediatrics 1957 ; 19 : 175-83.
8. Scott MB, Cosgrove MD. Salmonella infection and the genitourinary system. J Urol 1977 ; 118 : 64-8.
9. Barkin RM, Pfister RR, Ashbach NE. Salmonella : an unusual urinary tract pathogen. J Ped 1978 ; 92 : 158.
10. Mena Castro E, Vasquez DM, Chestaro L, De Luna E, Guzman M. Urinary tract infections in children [Article in Spanish]. Clin Infect Dis 1996 Aug ; 23 (2) : 388-90.
11. Ramos JM, Aguado JM, Garcia-Corbeira P, Ales JM, Soriano F. Clinical spectrum of urinary tract infections due on nontyphoidal *Salmonella* species. Clin Infect Dis 1996 Aug ; 23 (2) : 388-90.
12. Brown BJ, Asinobi AO, Fatunde OJ, Osinusi K, Fasina NA. Antimicrobial sensitivity pattern of organisms causing urinary tract infection in children with sickle cell anaemia in Ibadan, Nigeria. West Afr J Med 2003 Jun ; 22 (2) : 110-13.
13. Adam D, Daschner F. Relapse in chronic urinary tract infection in a child due to *Salmonella Brandenburg*. Infection 1973 ; 1 : 126-8.
14. Ross SA, Townes PL, Hopkins TB. *Salmonella enteritidis* : a rare cause of pyelonephritis in children. Clin Ped 1986 ; 25 : 325-6.
15. Hasham AI, Uehling DT. *Salmonella lithiasis*. J Urol 1976 ; 115 : 110-11.

السلمونيلا التيفية عند الأطفال وانتان المسالك البولية وحصاة

موجز: السلمونيلا سبب نادر في المسالك البولية عند الأطفال وتشارك مع شذوذ بنية الجهاز البولي أو نقص المناعة. سيرة حالة انتان بولي تال لانتان السلمونيلا التيفية ومشارك مع حصاة بولية عند طفلة عمرها 11 عاماً. مراجعة المنشورات حول الموضوع ومناقشتها.