Urinary Tract Infection by Nalidixic Acid Resistant *Salmonella enterica S*erotype Typhi

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ABSTRACT

Salmonella species are a rare cause of urinary tract infection in humans. Recovery of S. Typhi from urine is rare and can occur following a recent episode of typhoid fever or in a chronic carrier states involving the urinary system. It has been associated with a higher incidence of structural abnormalities of urinary tract. We report a case of a 50 year old female with urinary tract infection caused by Nalidixic acid resistant *Salmonella typhi* in association with nephrolithiasis.

Keywords: urinary tract infection; nalidixic acid resistant *Salmonella;* nephrolithiasis

INTRODUCTION

Enteric fever is caused by S. Typhi and S. Paratyphi serotypes A, B and C. It is amongst the common food or water borne diseases, which occurs due to fecal contamination by ill or asymptomatic chronic carriers. Enteric fever generally presents with gastrointestinal symptoms along with fever. Rarely, it may manifest as extra intestinal symptoms.[1, 2]

Recovery of S. Typhi from urine is a rare event, even in areas endemic for this infection.[3] It can be isolated from urine following a recent episode of typhoid fever, in chronic carrier states specially in individuals with structural or functional abnormalities of urinary tract, and occasionally following localized urinary tract infection (UTI) due to S. Typhi.[4, 5]

Acute symptomatic UTI is not a recognized manifestation of S. Typhi infection. Hence a patient of chronic UTI due to nalidixic acid resistant *Salmonella typhi* associated with nephrolithiasis is reported in this paper.

CASE REPORT

A fifty year old lady, known case of bilateral multiple nephrolithiasis since last fourteen years has been presenting to surgical department on and off with fever, suprapubic pain and dysuria. She has undergone Extracorporeal Shockwave lithotripsy twice and open surgery once 10 years back. In the month of October 2013, she attended the hospital with features of lower urinary tract infection (LUTS). Her urine sample was received for culture. First sample grew over 100,000 colonies of non-lactose fermenting bacteria per ml of urine, which was phenotypically suggestive of *Salmonella typhi*. Second urine sample was taken after 3 days for culture and it also grew over 100,000 colonies of non-lactose fermenting bacteria per ml of

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urine, phenotypically similar to *Salmonella typhi*. Both the time the strain was sensitive to amoxicillin (10 µg), chloramphenicol (30 µg), azithromycin (15 µg), cotrimoxazol (1.25/23.75 µg), ceftriaxone (30 µg) and cefotaxime (30 µg) but was resistant to nalidixic acid (30 µg) with reduced susceptibility to ciprofloxacin (5 µg) and ofloxacin (5 µg) [Nalidixic Acid Resistant Strain]. Serotyping was done (Denka Seiken, Japan) and confirmed as *Salmonella typhi*. At the same time her stool was also cultured which however was negative for *Salmonella.* Patient was treated for 10 days as per drug sensitivity. After 10 days of treatment the urine was subjected to culture again which revealed no growth.

Patient does not give history of enteric fever in the past, but her elder daughter had enteric fever twice who may be the source of infection in her family or the patient herself may be asymptomatic carrier.

The patient has few scattered small stones in both kidneys without hydronephrosis and impairment of renal function. Therefore no any immediate surgical undertaking is planned on her. She however remains in close follow up.

DISCUSSION

Salmonella UTIs are unusual and occur most often in an individual with predisposing factors like nephrolithiasis, hydronephrosis, anatomic abnormalities, schistosomiasis, tuberculosis and neoplasms of kidney.[6] It has been postulated that Salmonella enters the urinary tract either hematogenously or by direct invasion of the bladder via urethra. In women short urethra is considered to be a primary risk factor.[7]

Our patient had *Salmonella typhi* UTI associated with nephrolithiasis which was similar to the case report of Hasham et al who also reported a case of Salmonella UTI in 60 year old woman associated with nephrolithiasis[8] and Mourani C et al reported *S.* Typhi in a child with nephrolithiasis.[9] Similarly there are other reports of isolation of *Salmonella paratyphi A* from a patient with nephrolithiasis by *Fawzia E. Al*-Otaibi[10] and jain S et al.[11]

It is not known whether the lithiasis precedes Salmonella chronic carrier state or whether it is secondary to UTI. However, the authors have concluded that pre-existence of stones, local tissue damage may lead to the development of chronic Salmonella infection of the kidney. In this case as well, we presume that nephrolithiasis was the predisposing factor for development of recurrent UTI by *Salmonella typhi.*

CONCLUSION

To conclude, S. Typhi bacteriuria is a rare event in normal individuals. However, isolation of non-lactose fermenting bacteria in a urine sample in a patient with structural abnormalities should raise the suspicion of a *Salmonella* species the cause of UTI. If *Salmonella* UTI is confirmed, full investigation for evidence of systemic infection by *Salmonella* is advised. Regarding the treatment of patient, besides surgical removal of stone the patient should be provided appropriate antimicrobial coverage for prolonged period to remove the foci of infection.

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