STOOL-NEGATIVE NON-THYPHOIDAL *SALMONELLA* URINARY TRACT INFECTION: EXTREMELY RARE, YET STILL POSSIBLE CAUSE OF URINARY TRACT INFECTION IN KIDNEY TRANSPLANT RECIPIENTS

IVANA JURIĆ[1], NIKOLINA BAŠIĆ-JUKIĆ[1] and VIOLETA REZO VRANJEŠ[2]

[1]Zagreb University Hospital Centre, Department of Nephrology, Arterial Hypertension, Dialysis and Transplantation and [2]Department of Clinical and Molecular Microbiology, Zagreb, Croatia

Non-thyphoidal *Salmonella* usually presents as gastroenteritis while extra-intestinal manifestations are rare and mostly occur in patients with predisposing conditions such as chronic illness, urinary tract abnormalities, and immunosuppression. Urinary tract infection is the most common infectious complication in kidney transplant recipients. There are very few cases of urinary tract infections caused by non-thyphoidal *Salmonella* in kidney transplant recipients in the English literature, and to the best of our knowledge, only nine cases being stool negative. Although being extremely rare, non-thyphoidal *Salmonella* should be considered as one of the possible causes of urinary tract infections in kidney transplant recipients even without concomitant or preceding gastrointestinal symptoms. Bacteriuria can be present for some time after treatment requiring prolonged treatment and urine culture surveillance.

Key words: non-thyphoidal Salmonella, urinary tract infection, kidney transplantation

Address for correspondence: Ivana Jurić, MD
Department of Nephrology, Arterial Hypertension,
Dialysis and Transplantation
Zagreb University Hospital Centre
Kišpatićeva 12,
10 000 Zagreb, Croatia
Telephone: +385 1 2367 177. Fax: +385 1 2376 032
E-mail: ivanajuric1980@gmail.com

INTRODUCTION

Urinary tract infection (UTI) is the most common infectious complication in kidney transplant recipients with the incidence of 25%-75%. Gram-negative bacteria account for more than 70% of all UTI in kidney transplant recipients, with *Escherichia coli* being the most common pathogen followed by *Klebsiella* spp., *Pseudomonas aeruginosa* and *Enterococcus* spp. with significantly increasing rate of multidrug resistant pathogens (1, 2). Non-typhoidal *Salmonella* (NTS) urinary tract infection is rather uncommon and usually occurs in patients with predisposing conditions (3, 4). There are very few cases of NTS urinary tract infections in kidney transplant recipients in the English literature, and to the best of our knowledge, only nine cases being stool negative. We bring a case of our kidney transplant recipient with stool negative NTS UTI, with review of the literature.

CASE REPORT

At the age of 47, our patient with polycystic kidney disease received kidney from a deceased donor after previously having been treated with hemodialysis for 7 years. She received basiliximab as induction immunosuppressive therapy, followed by tacrolimus, mycofenolate-mofetil and steroids. Early posttransplant course was complicated with culture proven urinary tract infection caused by *Enterococcus faecium* and *Escherichia coli*. She was successfully treated according to the antibiotic sensitivity report and discharged from the hospital with excellent graft function. Subsequent posttransplant course was uneventful with no episodes of urinary tract infections. Graft function remained excellent with no episodes of acute rejections. Six years after transplantation, the patient presented to emergency room with fever and dysuria. No symptoms of gastrointestinal illness were present whatso-

ever. Laboratory investigations found increased white blood count and elevated C-reactive protein. Urine culture showed significant growth of *Salmonella enterica* Group B while stool samples and blood cultures remained negative. She was treated with ciprofloxacin 500 mg twice daily for 14 days with excellent clinical response. Repeated urine culture after treatment were sterile and graft function remained stable.

DISCUSSION

Non-typhoidal *Salmonella* (NTS) infections usually present as gastroenteritis, while extra-intestinal presentation is much less frequent and occurs mostly in immunocompromised patients (3,5,6). NTS urinary tract infections are uncommon with the occurrence frequency in the reported studies ranging from 0.015% to 0.9% (4,7,8), although one study has reported a higher prevalence of 3.4% (9). Infections are mainly associated with predisposing conditions such as chronic illness, immunosuppression or underlying urinary tract abnormalities (3,4,7). There are only few cases of NTS UTI in kidney transplant recipients reported in the English literature to date. Ramos *et al*. report the largest series of 7 patients. Urine culture was positive in all of them, with four patients having clinical manifestation of UTI and 3 patients having bacteremia with bacteriuria. Stool sample was positive in 3 patients, two of them having bacteremia. In 2 patients with negative stool and blood samples, bacteriuria was present after treatment for 5 and 8 weeks, respectively and they required prolonged treatment (10). In the report by Mussche *et al*., in 3 of 4 patients with NTS UTI stool samples were negative, two patients having bacteremia (11). Allerberger *et al*. report on 5 patients, 4 of them being positive for NTS in urine and stool samples while one patient was not tested for stool specimen. In 3 patients, asymptomatic bacteriuria was present after treatment for 3 weeks, 16 months and 13 months, respectively, with the latter patient developing NTS bacteriuria after 6 months of persistent bacteriuria (7). Two studies of 20 and 19 patients with NTS UTI report one kidney transplant recipient each. While Mellon *et al*. report on a patient with positive finding of NTS in stool samples, as well in blood cultures, Tena *et al*. report on a patient with negative stool, as well as blood samples (4, 12). In a single case report, Ito *et al*. describe a kidney transplant recipient with stool negative NTS UTI (13).

CONCLUSION

Non-thypoidal *Salmonella* is an extremely rare but possible cause of UTI in kidney transplant recipients. It should be considered as one of the possible causes of UTI in kidney transplant recipients even without concomitant or previous gastrointestinal symptoms. Bacteriuria can be present for some time after treatment requiring prolonged treatment and urine culture surveillance.

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SAŽETAK

INFEKCIJA MOKRAĆNIH PUTOVA UZROKOVANA NETIFOIDNOM SALMONELOM UZ NEGATIVAN NALAZ KOPROKULTURE – NETIFOIDNA SALMONELA: IZNIMNO RIJEDAK, ALI MOGUĆ UZROK INFEKCIJE MOKRAĆNIH PUTOVA U BOLESNIKA S TRANSPLANTIRANIM BUBREGOM

I. JURIĆ[1], N. BAŠIĆ-JUKIĆ[1] i V. REZO VRANJEŠ[2]

[1]Klinički bolnički centar Zagreb, Zavod za nefrologiju, arterijsku hipertenziju, dijalizu i transplantaciju i [2]Klinički zavod za kliničku i molekularnu mikrobiologiju, Zagreb, Hrvatska

Gastroenteritis je najčešća posljedica infekcije netifoidnom salmonelom. Ekstraintestinalne manifestacije su iznimno rijetke i najčešće se viđaju u bolesnika s predisponirajućim stanjima kao što su kronične bolesti, bolesti urotrakta i stanja povezana s imunosupresijom. Infekcije mokraćnih putova su najčešća infektivna komplikacija u bolesnika s transplantiranim bubregom. U literaturi je do sada opisano svega nekoliko slučajeva infekcija mokraćnih putova uzrokovanih netifoidnom salmonelom, a u samo devet slučajeva bakterija nije dokazana i u uzorcima stolice. Netifoidna salmonela je iznimno rijedak, no moguć uzročnik infekcija mokraćnih putova u bolesnika s transplantiranim bubregom, čak i u slučajevima bez pridružene ili prethodne kliničke slike gastroenteritisa. Nakon provedenog liječenja može zaostati asimptomatska bakteriurija pa je nakon završetka liječenja potrebno redovito uzimati nadzorne urinokulture.

Ključne riječi: **netifoidna salmonela, infekcija mokraćnih putova, transplantacija bubrega**