

Non-Typhoidal *Salmonella* Group D Bacteremia and Urosepsis in a Patient Diagnosed with HIV Infection

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ABSTRACT

Urinary tract infections caused by non-typhoid *Salmonella* are rare and usually develops in patients with predisposing factors such as immune deficiency or occult urologic problems. This report describes a case where *Salmonella* Group D was isolated from the blood and urine of a patient with documented human acquired immunodeficiency syndrome who developed urosepsis and was successfully treated with antibiotics.

Key words: Bacteremia, HIV, *Salmonella*, Urosepsis

INTRODUCTION

Salmonella are gram-negative non-spore-forming facultative intracellular anaerobes that cause a wide spectrum of disease, especially in the warm season.^[1] The clinical presentation depends on the serotype of *Salmonella* and host factors and can range from a gastroenteritis, enteric fever, bacteremia, focal infections, to a convalescent lifetime carrier state.^[2] The non-typhoidal species of *Salmonella* tend to produce a more localized response including self-limited form of gastroenteritis because they are believed to lack the human-specific virulence factors.^[1] Therefore, extra-intestinal non-typhoidal *Salmonella* (NTS) is uncommon and usually occurs in patients with predisposing factors such as immune deficiency or occult urologic problem. About 95% of cases of *Salmonella* infection are food-borne; however, the incidence of direct contact exposure with animal carriers is uprising.^[3] Therapeutic management depends on the clinical manifestations. Antibiotic administration is crucial in patients with systemic symptoms.^[4,5] Since *Salmonella* has the potential to grow intracellularly, antibiotics with high intracellular concentrations like ciprofloxacin should be utilized.^[6] However, percutaneous catheter drainage and

surgical intervention for abscesses can have important roles in the management of localized infections.^[7]

CASE REPORT

A 52-year-old male was admitted to our intensive care unit with high grade fever, shortness of breath, hypotension, and urosepsis. Patient had a history of poor oral intake for several weeks with significant weight loss. There was no history of cough, expectoration, nausea or vomiting, dysuria, bleeding, loose bowel movements or alteration of higher mental functions. The patient has been drinking unpasteurized camel milk. Patient had a past medical history of hypertension and diabetes. His social history single and denies sexual activities. He has served in the military. There was no past history of sexual transmitted diseases, blood transfusion, homosexuality, or travel outside the country. On physical examination, he was in moderate distress, febrile (38.1°C), with decreased breath sounds bilaterally and blood pressure of 100/50 mmHg; carotid pulsations were visible with no bruits and non-elevated jugular venous pressure (JVP). Cardiovascular examination showed normal heart sounds. Abdomen was soft, non-tender with no hepatosplenomegaly or pain on deep palpation. No other abnormalities were noted on systemic examination. Laboratory analysis revealed: hemoglobin, 85 g/liter; total leucocyte count, 6200/mm³; normal platelet count (1.6 × 10⁹/liter); C reactive protein, 222 mg/L. No malaria parasites were seen on blood smear. Additionally, colonoscopy and endoscopy showed internal

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hemorrhoids and gastritis. Gastric biopsy for *Helicobacter pylori* stain was negative. CT scan revealed no mediastinal, hilar or axillary lymphadenopathy. However, there was 3 cm pleural effusion noted on the right side and 1.4 cm on the left side with minor amount of pericardial effusion noted as well. Additionally, there were no focal changes noted in the liver, pancreas, spleen, kidneys, or adrenals. There was no retroperitoneal or intraperitoneal lymphadenopathy noted. There was minor amount of free abdominal fluid with lesser fluid noted within the pelvis.

Serial cultures of blood and urine revealed the presence of non-typhoidal *Salmonella* Group D sensitive to piperacillin/tazobactam, ciprofloxacin, and ampicillin, but resistant to cefuroxime, gentamicin, and trimethoprim/sulfamethoxazole. The antimicrobial susceptibility was performed using Kirby Bauer disk diffusion method. Hence, the decision was to investigate for malignancy, tuberculosis, or HIV as a differential diagnosis for the unusual presence of NTS in the blood and urine. A positive ELISA result, followed up with a positive Western blot test, confirmed the diagnosis of HIV. Cytology report was negative for malignancy. Sputum smears and cultures using fluorescence microscopy for acid-fast bacilli were also negative. The patient was treated with ciprofloxacin 200 mg IV twice daily, which was then switched to piperacillin/tazobactam 3 days later with a total duration of 7 days. A urine culture obtained later showed negative growth.

DISCUSSION

Non-typhi *Salmonella* urinary tract infection (UTI) is uncommon and usually occurs in patients with a predisposition.^[8] *Salmonella* can infect the urinary tract through hematogenous spread or ascending the urethra after direct invasion.^[9] In our case, the patient had blood stream invasion of *Salmonella* that was most likely due to an exposure to unpasteurized camel milk. As such, hematogenous spread as a potential etiology for seeding the urine in our patient is most likely. Since the vast majority of *Salmonella* infections involve the gastrointestinal tract; the urinary symptoms and subsequent urosepsis raised the question of a predisposing factor. Our patient was diagnosed with an HIV infection and hence had the extraintestinal manifestation of non-typhoidal *Salmonella*. *Salmonella* bacteremia is a well-known manifestation of immunosuppression in patients with human immunodeficiency virus infection, and these patients have 20 to 100 fold increased prevalence of acquiring *Salmonella* infection and bloodstream invasion versus the general population.^[10] Our patient had a CD4 count of 11 and a very low CD4/CD8 ratio (7%), which represents a state of severe immunosuppression. As such, the

patient developed bacteremia, which is the most common manifestation of salmonellosis in immunocompromised patients and is considered an AIDS-defining illness.^[11] Moreover, focal infections in HIV-infected patients including urinary tract are more prevalent compared to general population.^[12] Our patient developed urosepsis subsequent to bacteremia that was successfully treated with antibiotics without the development of renal scarring. The duration of treatment was 7 days.

CONCLUSION

The presence of extraintestinal non-typhoidal *Salmonella* serotypes should raise an index of suspicion for predisposing factors. Therefore, the presence of underlying diseases should be investigated. Our patient was diagnosed with an HIV, and prompt antibiotics were started for the management of his urosepsis. The patient recovered without any renal complications. An early treatment seems to determine a good outcome.

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