Salmonella Sepsis and Urinary Tract Infection Complicating with Acute Kidney Injury in a HIV Positive Female Patient

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ABSTRACT

Urinary Tract Infection (UTI) can rarely be caused by salmonella species. UTI salmonellosis may present as uncomplicated UTI, pyelonephritis or haemorrhagic cystitis. We present a case of a 44-year-old HIV positive female who presented with frank haematuria, fever, dysuria and confusion. These were preceded by non-bloody diarrhea that had resolved on presentation. Blood and urine culture grew salmonella species. The course of the patient was complicated by acute kidney injury that required haemodialysis. Patient improved on a two-week course of antibiotics with subsequent negative blood and urine cultures. We emphasise the importance of prevention on exposure of risk factors and close follow-up due to high risk of recurrence in special groups of patients.

Keywords: Antiretroviral therapy, Foodborne pathogens, Human Immunodeficiency virus, Urosepsis

CASE REPORT

A 44-year-old HIV-infected patient presented with two days history of fever with chills, dysuria, suprapubic pains and frank haematuria. Her condition had worsened on the day of admission whereby at this point she was confused. These presenting symptoms were preceded by one week history of non-bloody diarrheaa; the diarrheaa had stopped four days prior to presentation (this history was obtained around day five when patient had improved).

There was no history of colicky abdominal pain/ flank pains. There was no history of weight loss, bone pains, noted breast lump(s), joint swelling, night sweats, cough, and chest pain, shortness of breath or pharyngitis/tonsillitis. She had no history of genitourinary/ gynaecologic/gastrointestinal surgery. She reared chickens at her home and admitted to handle them on daily basis. There was no recent history of consumption of uncooked meat (pork, beef, chicken) or unpasteurised milk, cheese or raw eggs. She didn’t report any contact with anyone who presented with similar symptoms. Patients’ medical history was significant for being HIV-positive for over 13 years with history of multiple episodes of antiretroviral therapy defaulting.

Her CD4 and viral load at presentation were 354 cells/mm³ and 2355 copies/mL respectively. Patient was diagnosed to have HIV virological failure (viral load) of 17.93×10⁹/L (4-10); Neutrophilia of 14.6×10⁹/L (2-7); Lymphopenia of 0.8×10⁹/L (1-3); Haemoglobin of 10.5 g/dL (12-15); Platelet of 574×10⁹/L (150-400). Liver function tests/enzymes were within the normal range except for hypoalbuminemia of 28 µmol/L. Chest x-ray and electrocardiogram were unremarkable.

Abdominal-pelvic ultrasound done on day seven of admission revealed diffuse abdominal distension. There was no history of colicky abdominal pain/ flank pains. There was no history of weight loss, bone pains, noted breast lump(s), joint swelling, night sweats, cough, and chest pain, shortness of breath or pharyngitis/tonsillitis. She had no history of genitourinary/ gynaecologic/gastrointestinal surgery. She reared chickens at her home and admitted to handle them on daily basis. There was no recent history of consumption of uncooked meat (pork, beef, chicken) or unpasteurised milk, cheese or raw eggs. She didn’t report any contact with anyone who presented with similar symptoms. Patients’ medical history was significant for being HIV-positive for over 13 years with history of multiple episodes of antiretroviral therapy defaulting.

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Abdominal-pelvic ultrasound done on day seven of admission was remarkable and it showed kidneys of normal size with a well-differentiated corticomedullary junction. The patient was diagnosed as having Acute Kidney Injury (AKI) as a complication of salmonella bacteremia and UTI. AKI was complicated by metabolic acidosis, hyperkalaemia and uremic encephalopathy. Frank haematuria was adjudged to be secondary to haemorrhagic cystitis; the latter being a complication of salmonellosis UTI.

Arterial Blood Gas (ABG) analysis was consistent with metabolic acidosis with pH of 7.205; hyperkalaemia of 5.94 mmol/L and bicarbonate of 5.3 mmol/L. Urgent renal function tests revealed markedly elevated serum creatinine and urea of 1756 umol/L and 72.82 umol/L respectively. Patient’s haemogram revealed leucocytosis with White Blood Cell (WBC) of 17.93×10⁹/L (4-10); Neutrophilia of 14.6×10⁹/L (2-7); Lymphopenia of 0.8×10⁹/L (1-3); Haemoglobin of 10.5 g/dL (12-15); Platelet of 574×10⁹/L (150-400). Liver function tests/enzymes were within the normal range except for hypoalbuminemia of 28 µmol/L. Chest x-ray and electrocardiogram were unremarkable.

Urinalysis revealed red blood cells (RBCs) >100/ HPF and white blood cells (WBCs) of 1756 umol/L and 72.82 umol/L respectively. Patient’s haemogram revealed leucocytosis with White Blood Cell (WBC) of 17.93×10⁹/L (4-10); Neutrophilia of 14.6×10⁹/L (2-7); Lymphopenia of 0.8×10⁹/L (1-3); Haemoglobin of 10.5 g/dL (12-15); Platelet of 574×10⁹/L (150-400). Liver function tests/enzymes were within the normal range except for hypoalbuminemia of 28 µmol/L. Chest x-ray and electrocardiogram were unremarkable.

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Patient was initiated on Intravenous ceftriaxone on the day of admission at the dosage of 1 gm once a day. The dosage of ceftriaxone was adjusted for renal functions [1]. On day five when we got culture results, we considered against increasing the dosage of ceftriaxone to cover for possible typhoid salmonella as we did not have serotype results; our decision was based on high likelihood of non-typhoid salmonella due to risk factor of rearing chicken and clinical resolution of symptoms. Ceftriaxone was administered for a prolonged period of 14 days in view of complicated infection in an immunosuppressed patient with atypical infection [2]. In the view of AKI; patient was also started on urgent haemodialysis, this was stopped on day seven when serum creatinine fell to 356 µmol/L and the patient was kept on maintenance intravenous normal saline. Antiretroviral therapy was switched to a renal friendly regimen of abacavir/lamivudine/dolutegravir with the view to consider patient’s pre-admission regimen as renal function improves. Blood and urine culture repeated on day seven of admission were negative. Patient completed a two-week course of antibiotics. On day 14, her serum
creatinine and urea were 152 umol/L and 7.09 umol/L respectively. She was counseled on safe handling of chicken to avoid salmonella reinfection as this was the only identified possible source. Oral ciprofloxacin at a dosage of 500 mg twice a day for four weeks was prescribed as secondary prophylaxis.

She was referred to Infectious Disease Unit to have more sessions on adherence and consideration of antiretroviral therapy switch. She has been seen at the medical clinic after 4 and 12 weeks of discharge; she remains asymptomatic.

DISCUSSION

A previous study in Botswana done between February 2003 to July 2008 revealed that Salmonella and Shigella were the most common organisms isolated from stool specimens [3]. On the other hand; 65 (21.7%) out of 300 samples of raw meat sausages in Botswana comprised Salmonella isolates [4].

Urinary tract infection from Salmonella is rare [5,6] and usually associated with either genitourinary structural abnormalities or immunosuppressive and chronic conditions such as HIV, diabetes mellitus, and rheumatologic diseases such as rheumatoid arthritis and systemic lupus erythematosus. Other chronic illnesses predisposing to Salmonella UTI include cardiopulmonary or liver disease, malignancies and chronic haemodialysis [7-9]. Salmonella UTI usually results either from direct urethral invasion or haematogenous spread from gastroenteritis [8]. Sepsis from salmonella infection is the leading cause of morbidity and mortality in HIV-positive patients in developing countries [10,11] with prevalence as high as 37% in a study done in Malawi among HIV-infected patients [10]. Mortality secondary to Salmonella sepsis among patients is estimated to be as high as 77% [10].

We believe that the pathophysiology of salmonella UTI in our patient is haematogenous spread from the gastrointestinal tract; this is due to the fact that UTI was preceded by diarrhea episode [9,12] that had resolved on presentation. Our laboratory could not do serotyping to differentiate whether salmonella infection was typhoidal or non-typhoidal; however the fact that our patient reared chicken and was directly involved in the handling process, it makes non-typhoidal salmonella the most likely possibility [5,13].

Patients with HIV-infection are at high risk of salmonella recurrence [14]; with recurrence more likely to be due to recrudescence rather than re-infection [11]. A study by Gordon MA et al., in Malawi revealed a high recurrence rate of 43% [11]. Furthermore, recurrence has been shown to occur more in patients with detectable virological load [11]. The presented patient is a habitual defaulter of antiretroviral therapy with detectable viral load; hence at high risk of recurrence. It has been previously shown that good virological response reduce the chance of recurrence as well as re-infection as this was the only identified possible source. Oral ciprofloxacin at a dosage of 500 mg twice a day for four weeks was prescribed as secondary prophylaxis. Hence, we instituted secondary prophylaxis with quinolone with similar observation seen in sub-Saharan Africa [11].

Hence, we instituted secondary prophylaxis with quinolone and recommended to continue long-term suppressive therapy with quinolone or cotrimoxazole [9,16]. Despite the fact that; we don’t have guidelines for prophylaxis against non-typhoid salmonella; we considered that our patient had high likelihood of recurrence due her immunosuppression status with similar observation seen in sub-Saharan Africa [11]. Hence, we instituted secondary prophylaxis with quinolone with outcome of no recurrence after four weeks. In case of relapse, it is recommended to continue long-term suppressive therapy with quinolone or cotrimoxazole [9,17].

CONCLUSION

Salmonella infection is a rare cause of UTI in high risk individuals such as HIV positive. Thorough history taking is important to establish risk factors and initiate appropriate treatment. We emphasise the importance of prevention on exposure of risk factors and close follow-up due high risk of recurrence in specific groups of patients.

REFERENCES


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