CASE REPORT

Acute Kidney Injury in Anicteric Leptospirosis with Typhoid Fever

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ABSTRACT

Introduction: **Leptospirosis is an infectious disease caused by spirochete Leptospira. Clinical presentation varies from mild symptoms, usually anicteric (85%-90%), to Weil's disease with jaundice, hemorrhagic manifestations, and acute kidney injury (AKI). The incidence of leptospirosis with typhoid fever is very rare, around 1% - 2%.**

Case presentation: **A male, 42 years old, presented with fever for 2 weeks, pain in the muscle and joint, diarrhea and non-icteric sclera. Laboratory finding showed increased serum creatinine 3,34 mg/dl, IgM leptospirosis positive, Widal test (Salmonella typhi O : 1/320, H : 1/160), with the modified Faine's Criteria score is 27. Clinical and laboratory improvements were obtained after antibiotics administration for 12 days without hemodialysis.**

Discussion: **Changes in hemodynamics, immune response, and direct nephrotoxicity are the cause of AKI in leptospirosis. Anicteric leptospirosis tends to cause mild AKI, meanwhile severe AKI with poor prognosis could happen when it is accompanied by multiple organ involvement. Co-infection of *Salmonella* and *Leptospira* is very rare even in areas where these two pathogens are endemic. The clinical features of both diseases are non-specific and overlapping, making it very difficult to be differentiated. Immediate administration of antibiotics in the early stages of the disease may prevent further complications.**

Conclusion: **A case of AKI in anicteric leptospirosis accompanied with typhoid fever, showed improvements in both clinical and laboratory findings after intravenous antibiotics were given, without hemodialysis treatment**

KEY WORDS

acute kidney injury, anicteric leptospirosis, typhoid fever

INTRODUCTION

Leptospirosis, caused by *spirochete Leptospira* bacteria, is a zoonotic disease with worldwide distribution and increasing prevalence[1]. Clinical presentation ranges from mild symptoms, usually anicteric (85%-90%), to Weil's disease with jaundice, hemorrhagic manifestations, and AKI[2,3]. Incidence of AKI in leptospirosis is 40%-60%, depends of the severity of the disease[3]. The study conducted by Markum HMS (2004)[4] showed that the incidence of AKI in leptospirosis patients is 88.2% and 71.3% of patients with kidney disorders have jaundice and only 28.7% of anicteric patients. Incidence of leptospirosis with typhoid fever is very rare, around 1%-2%. A study by Sushi KM *et al*. (2014)[5] in a seroprevalence study from South India, out of 100 samples, only two were positive for typhoid and leptospirosis.

CASE PRESENTATION

A man, 42 years old, had fever for 2 weeks, pain in muscles and joints, diarrhea with normal urination. No history of type 2 diabetes mellitus, hypertension, and kidney disorders. Blood pressure was 100/60 mmHg, non-icteric sclera, and splenomegaly with Schuffner I were observed. Laboratory examination showed platelets of 51.000/µL, AST 201 U/L, ALT 101 U/L, BUN 35,42 mg/dl, serum creatinine 3.34 mg/dl, blood potassium 3.3 mmol/L, positive Widal test (Salmonella typhi O:1/320, H:1/160). At first, we diagnosed the patient with typhoid fever, AKI, elevated transaminase enzymes, and mild hypokalemia. The patient was given an infusion of normal saline (NaCl 0.9%) 500 cc/8 hours, intravenous Ceftriaxone 1 gram/24 hours, antipyretics, and analgesics Paracetamol 500 mg + N-acetylcysteine 200 mg, hepatoprotector/12 hours.

On the fifth day, the patient still had a fever and diarrhea, the urine volume was 0.48 ml/kgBW/hour, platelets 87,000/µL, creatinine 8.92 mg/dl, BUN 98,33 mg/dl, AST 376 U/L, ALT 167 U/L, dengue IgM and IgG tests were negative. On the ninth day, the patient remain in fever, no diarrhea, the urine volume 0.59 ml/kgBW/hour, BUN 52,2 mg/dl, creatinine 2.88 mg/dl, AST 105 U/L, ALT 153 U/L, no hyperbilirubinemia, positive IgM leptospirosis, creatinine kinase (CK) 350 U/L. Modified Faine's Criteria score was 27. The patient was diagnosed with AKI in anicteric leptospirosis accompanied by typhoid fever.

After twelve days of treatment, the patient improved clinically, normal platelets liver function improved (AST 23 U/L, ALT 25 U/L), and kidney function improved (BUN 17,71 mg/dl, creatinine 1.3 mg/dl) without hemodialysis.

DISCUSSION

In anicteric leptospirosis, the patients usually present with sudden onset of fever, accompanied by chills, headache, myalgia, abdominal pain, conjunctival injection, and less common, a skin rash. Anicteric

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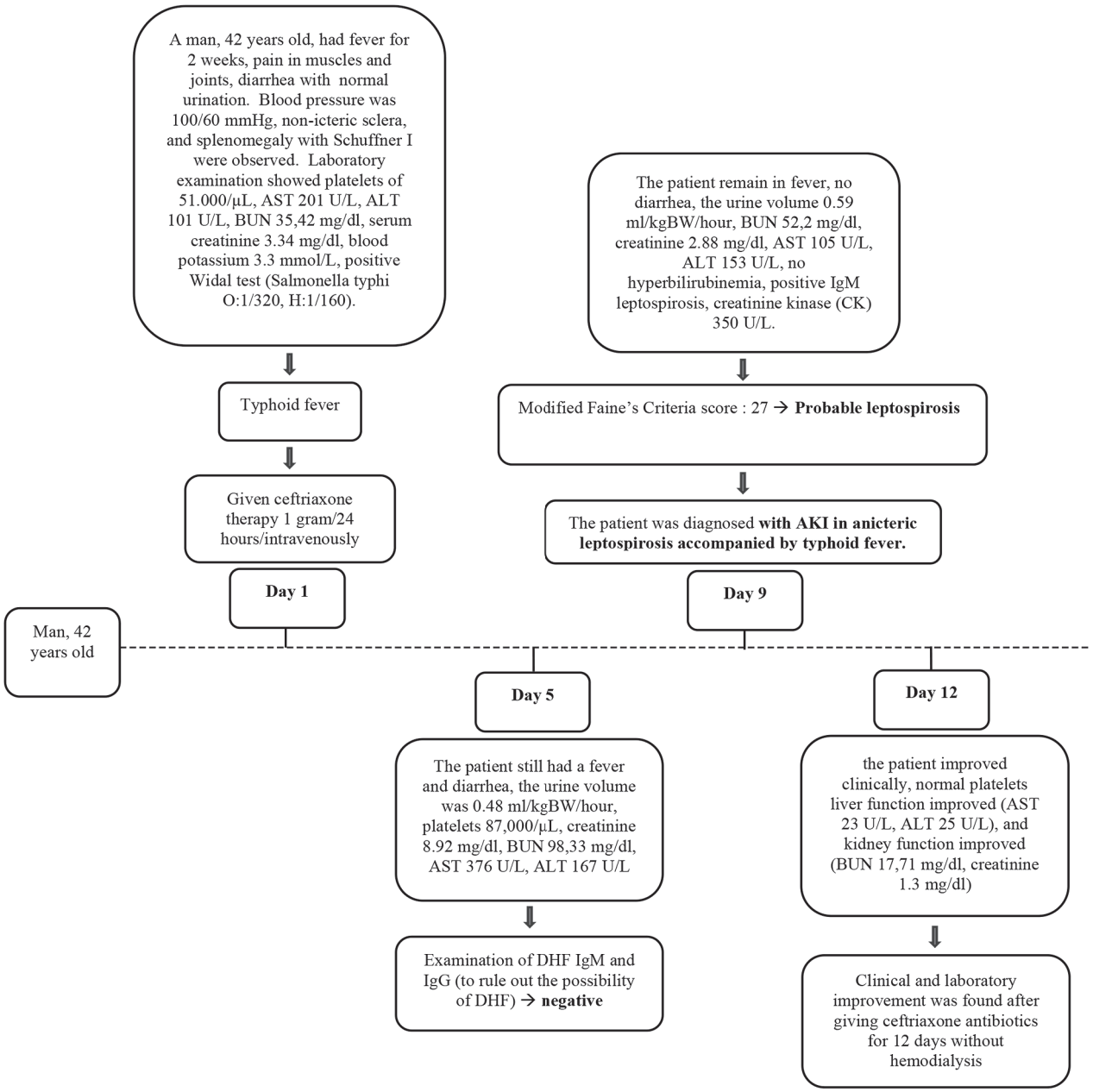

Figure 1: Progress Chart

leptospirosis usually lasts about 7 days, and its resolution correlates with the appearance of antibodies[6]. Myalgia in patients can be a sign of rhabdomyolysis that can be detected through increased levels of CK which has been reported in 45%-63% of cases. Relationship between rhabdomyolysis and acute renal impairment is renal vasoconstriction, tubular obstruction, and direct toxic effects of myoglobulin[7].

Incidence of acute renal impairment reaches 40-60% in severe leptospirosis. Acute interstitial nephritis and acute tubular necrosis are the most common forms that cause acute renal impairment[8]. Hemodynamic changes, immune response, and nephrotoxicity are directly involved in the development of renal lesions[9]. No signs of chronicity (dry skin, itching, anemia, hypertension), disproportionate ratio of urea and creatinine (BUN 35,42 mg/dl, creatinine 3.34 mg/dl), and normal renal ultrasound were obtained, therefore the patient was assessed with AKI[10]. Clinically, acute non-oliguric renal failure, hypokalemia, and sodium wasting are common in leptospirosis[9].

The definitive diagnosis of Leptospira is confirmed by the isolation of bacteria in the blood, urine, or cerebrospinal fluid cultures or by the occurence of antibodies to bacteria in the blood and serology test[11]. In this patient, due to limited facilities, only Leptodipstick examination with positive results was obtained, therefore leptospirosis infection is probable. Bajani *et al*. (2003)[12] reported a sensitivity of rapid assay 79%-93.2% and a specificity of 89.6%-98.8%, depending on the examination method used. Using the Modified Faine's criteria (2012), a presumptive diagnosis of leptospirosis was obtained[13].

Coinfection of salmonella and Leptospira is very rare even in areas where these two pathogens are endemic. The clinical features are non-specific and overlapping, making it very difficult to differentiate between these two infections. One study in Egypt said that in patients with icteric leptospirosis accompanied by typhoid fever, liver disorders were more severe than leptospirosis alone[14].

Early diagnosis and appropriate therapy are important points in the management of leptospirosis. Antibiotic therapy is efficient in both the early and late stages of the disease. Based on the recommendations of the WHO in 2003, severe leptospirosis should be treated with intravenous antibiotics such as penicillin (1.5 million unit/6 hours), ceftriaxone (1 gram/day), or cefotaxime (1 gram/6 hour), which is given for 7-10 days[11].

CONCLUSION

We reported a case of AKI in anicteric leptospirosis with typhoid

fever, given intravenous antibiotics without hemodialysis, clinical and laboratory improvements were found.

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