Leptospirosis presenting with acute kidney injury, Case Report

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ABSTRACT

Leptospirosis is very common in the tropical regions, with 73% of cases occurring in this region, particularly in South-East Asia, Eastern Sub-Saharan Africa, the Caribbean and Oceania. Farmers who are in contact with livestock and exposed to rodents in their workplaces, and people living in areas with poor sanitation are at highest risk.

A 47-year-old male patient presented to the emergency room with complaints of weakness, fever, nausea and vomiting that continues for 4-5 days. He was found to be hypotensive (blood pressure arterial 83/55 mmHg) and tachycardic (pulse: 125 beats/minute) at the time of admission. The patient who had no history of chronic disease, was engaged in farming. In the laboratory tests performed in the emergency room, Leukocyte count: 7470 103/µL, hemoglobin:13.4 g/dL, platelet: 15000 103/µL in the complete blood count. Biochemistry parameters: urea:113 mg/dL, creatinine: 2.5 mg/dL, AST:138 IU/L, ALT:80 IU/L, total bilirubin: 6.29 mg/dL, direct bilirubin: 3.78 mg/ dL, LDH:264 IU/L, c-reactive protein: 322 mg/L were detected. Patient was consulted to infectious disease thus It was recommended to send salmonella, brucella and leptospirosis samples, as well as hepatitis A-B-C, toxoplasma, cytomegalovirus (CMV), ebstein barr virus (EBV) serology. The patient was started empirically with doxycycline 2x100 mg/PO and ceftriaxone 2x1gr iv with their recommendations. On the 5th day of his treatment, the leptospirosis PCR test was positive. Liver function tests, bilirubin, kidney function tests and acute phase reactants decreased to normal values with antibiotic treatment.

The diagnosis of leptospirosis is made based on the presence of questionable clinical features with a history of risk exposure. Renal failure is often non-oliguric and is associated with hypokalemia. Supportive renal replacement therapy may be required in the acute phase, but renal function recovery is rapid and complete after six months. In our case, the platelet count was 15,000 103/µL at the time of admission and back to normal values within 1 month of the treatment. Leptospirosis which is a zoonotic disease should be considered in the differential diagnosis in patients presenting with acute kidney injury, thrombocytopenia, hyperbilirubinemia, liver function test disorders, and acute phase reactant elevation.

Keywords: leptospirosis, acute kidney injury, hyperbilirubinemia

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Leptospirosis is very common in the tropical regions, with 73% of cases occurring in this region, particularly in South-East Asia, Eastern Sub-Saharan Africa, the Caribbean and Oceania.

It is common among rural farmer populations and poor urban and semi-urban populations, particularly affecting young male adults.

Farmers who are in contact with livestock and exposed to rodents in their workplaces, and people living in areas with poor sanitation are at highest risk [1]. Human leptospirosis has a variety of clinical manifestations. While clinical disease in humans presents with mild, self-limiting mostly uncomplicated fever, approximately 10% of them present with multi-organ dysfunction and may constitute a serious and life-threatening condition (2-3).

Serious complications such as acute kidney injury, liver injury, myocardial involvement and pulmonary hemorrhage, and numerous other manifestations have been reported [3, 4].

Conjunctival redness, jaundice, and acute kidney injury with classic presentation constitute Weil's syndrome. Pulmonary bleeding has recently been shown to be an important cause of mortality [3-5]

The diagnosis of leptospirosis is made on the basis of characteristic clinical findings revealed by a history of risk exposure, by demonstration of bacterial DNA or culture providing direct evidence of infection and /or by demonstration of antibodies to leptospirosis providing indirect evidence of infection [6].

While patients with suspected or confirmed leptospirosis who have mild clinical findings and no comorbidity can be followed up as an outpatient, patients with comorbidities and organ involvement should be hospitalized. Early initiation of antibiotic therapy affects the prognosis positively [6]

CASE

A 47-year-old male patient presented to the emergency room with complaints of weakness, fever, nausea and vomiting that continues for 4-5 days. He was found to be hypotensive (blood pressure arterial 83/55 mmHg) and tachycardic (pulse: 125 beats/minute) at the time of admission. In the physical examination performed in the emergency room, the patient was conscious, oriented and cooperative, and had an icteric appearance. Respiratory system, abdomen and neurological system examination were normal. In the emergency service follow-up, there is 550 cc urine output in 6 hours. The patient who had no history of chronic disease, was engaged in farming.

In the laboratory tests performed in the emergency room, Leukocyte count: 7470 103/µL, neutrophil: 6670 103/µL, lymphocyte: 430 103/µL, hemoglobin:13.4 g/dL, platelet: 15000 103/µL in the complete blood count. In urinanalysis density: 1022, erythrocyte: 1352 / HPF (large magnification), leukocyte: 5/HPF, protein 2+, bilirubin 2+, urobilinogen was negative. Biochemistry parameters: urea:113 mg/dL, creatinine: 2.5 mg/dL, sodium: 133 mmol/L, potassium: 3.9 mmol/L, pH in venous blood gas: 7.42, HCO3: 27.8 mmol/L, pCO2:42.9 mmHg, AST:138 IU/L, ALT:80 IU/L, total bilirubin:

6.29 mg/dL, direct bilirubin: 3.78 mg/ dL, LDH:264 IU/L, c-reactive protein: 322 mg/L were detected.

No pathology was detected in the chest X-ray in the imaging performed in the emergency department. In the abdomen USG, the liver dimensions were larger than normal and 162 mm in size, the spleen dimensions were normal, and the gallbladder wall thickness was increased and measured as 4 mm. With these signs and symptoms, the patient was followed up in the intensive care unit with the prediagnoses of acute kidney injury, sepsis, microangiopathic hemolytic anemia (MAHA), and cholangitis. Urgent hemodialysis was not considered in the patient who did not have any uremic symptoms due to the current clinical and laboratory findings. No signs of hemolysis (fragmented erythrocytes, polychromasia, etc.) were found in the peripheral smear, and the platelet count was found to be decreased in line with the hemogram. MAHA and pseudothrombocytopenia were ruled out.

Patient was consulted to infectious disease thus It was recommended to send salmonella, brucella and leptospirosis samples, as well as hepatitis A-B-C, toxoplasma, cytomegalovirus (CMV), ebstein barr virus (EBV) serology. The patient was started empirically with doxycycline 2x100 mg/PO and ceftriaxone 2x1gr iv with their recommendations.

As the general condition of the patient improved and his vitals were stable, he was followed up in the Nephrology clinic. No pathology was detected in MR-cholangiopancreatography performed with the preliminary diagnosis of cholangitis. The serological tests for hepatitis, toxoplasma, CMV and EBV were negative.

On the 5th day of his treatment, the leptospirosis PCR test was positive. Liver function tests, biliru-

bin, kidney function tests and acute phase reactants decreased to normal values with antibiotic treatment. The patient, whose antibiotic treatment was completed for 7 days with the recommendation of infectious diseases, was discharged with the recommendation of outpatient follow-up.

DISCUSSION

The diagnosis of leptospirosis is made based on the presence of questionable clinical features with a history of risk exposure. Renal failure is often non-oliguric and is associated with hypokalemia.

Urinalysis often shows proteinuria, pyuria, granular casts, and less often microscopic hematuria. Histological findings include interstitial nephritis and acute tubular necrosis. Supportive renal replacement therapy may be required in the acute phase, but renal function recovery is rapid and complete after six months [7]. In our case, proteinuria, pyuria, and microscopic hematuria were observed in the urine examination performed during the emergency admission. There was also non- oliguric acute renal injury. The creatinine level at the time of admission was 2.5 mg/dL and back to normal values within 1 month of the treatment. (Graphic Kreatinin !)

In a retrospective study involving icterohemorrhagic leptospirosis cases in Iran, thrombocytopenia was observed in more than 88% of the cases and azotemia was observed in approximately one third of the cases [8]. In our case, the platelet count was 15,000 103/µL at the time of admission and back to normal values within 1 month of the treatment. (Graphic Trombosit!)

Hyperbilirubinemia is frequently seen in Weil's disease. Bilirubin elevation can be mild or severe. In a case report from Puca E. et al, it was reported that the total bilirubin level reached 73.4 mg/dl on the 4th day of treatment [9]. In our case, the total bilirubin level, which was 6.29 mg/dl at the time of admission, progressed to 14.75 mg/dl on the 4th day of treatment.

Leptospirosis which is a zoonotic disease should be considered in the differential diagnosis in patients presenting with acute kidney injury, thrombocytopenia, hyperbilirubinemia, liver function test disorders, and acute phase reactant elevation. With early diagnosis and medical treatment, mortality and morbidity are significantly reduced.

CONCLUSION

Authors' Contribution

Study Conception: MU,; Study Design: MU,; Supervision: SA,; Materials: ÖBK,; Data Collection and/or Processing: ÖBK,; Statistical Analysis and/or Data Interpretation: SA,; Literature Review: SA,; Manuscript Preparation: SA and Critical Review: ÖBK.

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