Acute liver failure as the initial presentation of leptospirosis in a young patient: A challenge in critical care. Case report

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Case Report

Intensive Care

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Background: Leptospirosis is a zoonotic infection with a worldwide distribution, with prevalence in rural areas and urban areas with sanitation deficiencies. Initial symptoms are vague, including fever, headaches, myalgias, being easily confused for other acute febrile infections such as dengue or rickettsiosis, leading to a delay in diagnosis and treatment. In severe cases, progression to acute liver failure, acute kidney injury or respiratory failure have been described, prompting the need for opportune diagnosis. In this case, a 17 y/o female with no known medical history, with recent travel history to Guerrero, Mexico presented with fever and fatigue, with later additions of myalgias and paraesthesia. After an outpatient medical visit, the presumptive diagnosis was dengue fever, with symptomatic care initiated. Symptoms persisted, and after clinical deterioration she presented to the emergency department (ED) hemodynamically unstable, with need for crystalloid resuscitation and vasopressor therapy with admission to the intensive care unit (ICU). The diagnostic approach and management are described from her admission to the ED to ICU stay and discharge. This case represents the diagnosis challenge from leptospirosis due to unspecific clinical presentations and its potential to mimic other zoonotic diseases. Improving clinical suspicion and diagnostic tests readiness are key to reduce mortality and morbidity associated with this disease.

Keywords: Leptospirosis.

Leptospirosis is one of the most important zoonotic bacterial infections worldwide. It is common among rural populations and impoverished urban and semi-urban populations, particularly affecting young adult men. Urban outbreaks are common in settings where sanitation is deficient and rats breed in abundance. (1) The clinical presentation of the disease is diverse and ranges from a flu-like illness to a severe disease with multiorgan failure and death. In mild infections, patients typically present with symptoms such as fever, headache, and myalgia, and less frequently with meningitis, conjunctival suffusion, rash, renal failure, and jaundice. The symptoms can be biphasic, and some may resolve spontaneously. However, these symptoms and signs are nonspecific and could frequently be misdiagnosed as other causes of acute febrile illness such as dengue fever, influenza, or malaria. (2) We present a clinical case of a 17-year-old young woman who presented with acute liver failure associated with an acute case of leptospirosis.

Case report

A 17-year-old previously healthy female returned from a 1-month stay in a rural region of the state of Guerrero, Mexico, where she was exposed to farm animals, pesticides, ticks, mosquitoes, and unsanitary food/water.

Subsequently, 2 days prior to her admission to this hospital, she presented with a low-grade fever and generalized weakness. She consulted at an outpatient clinic where; after reviewing the patient, the physician mentioned a presumptive diagnosis of dengue fever with signs of severity due to a positive tourniquet test. Symptomatic management was initiated with a single dose of diclofenac and acetaminophen tablets. One day later, myalgias, arthralgias, and paresthesias in the limbs were added, and she continued management with acetaminophen. On the day of her admission, her condition worsened, and she was referred to our institution.

Upon her arrival at the emergency department, the patient was conscious with a FOUR score of 16 points, with signs of hemodynamic instability characterized by hypotension of 60/40 mmHg, tachycardia of 145 bpm, and oxygen saturation of 96% at room air. Therefore, she was admitted to the resuscitation area where volume resuscitation was performed. A 500cc bolus of Hartmann's solution was administered, which resulted in an increase in blood pressure to 120/80 mmHg. The patient workup was

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LABORATORY	Day 1	Day 2	Day 10
HB	15.2 g/dL	13.3 g/dL	9.89 g/dL
HCT	46.3 %	41.6 %	33.3 %
WBC	4.56 K/uL	3.46 K/uL	4.28 K/uL
NEU	4.18 K/uL	2.45 K/uL	2.06 K/uL
PLT	184 K/uL	146 K/uL	273 K/uL
GLUCOSE	60 mg/dL	107 mg/dL	91 mg/dL
AST	3539 UI/L	5769 UI/L	541 UI/L
ALT	2755 UI/L	3820 UI/L	214 UI/L
DHL	2612 UI/L	4386 UI/L	217 UI/L

Table 1. Laboratory values.

initiated, and laboratory studies were requested (Table 1).

Given the elevation of transaminases, acute liver failure was suspected (. A viral panel for Human Immunodeficiency Virus, Hepatitis B, and Hepatitis C was requested, which resulted negative. Immunological pregnancy test was negative. Additionally, PCR for dengue and rickettsia was performed, both with negative results. A focused physical examination was carried out which evidenced an erythematous lesion approximately 1 cm in diameter, leading to zoonotic illness being suspected as the primary diagnostic option.

During her stay in the emergency department, she presented a new event of hypotension, for which management with norepinephrine at low doses was initiated. This maintained adequate tissue perfusion. Likewise, three events of hypoglycemia were evidenced, with values below 70 mg/dL, leading to the decision to start a fluid plan with 10% dextrose solution to maintain a constant glucose supply. Among the diagnostic options, the possibility of acetaminophen intoxication was considered, and N-acetylcysteine was initiated empirically. Also, due to the initial suspicion of zoonotic illness, doxycycline was administered with a 200 mg loading dose (single dose) followed by 100 mg every 12 hours. At this point, transfer to the intensive care unit (ICU) was decided.

Additionally, results for Leptospira antibodies were obtained, showing a positive result for anti-leptospira IgM of 14.8 UA, establishing the diagnosis of Leptospirosis. During her stay in the adult intensive care unit, vasopressors were titrated until they were suspended, and treatment with ceftriaxone was completed. The hypertransaminasemia showed a downward trend, (Figure 1) and due to the improvement in her hemodynamic status and lack of deterioration in her ventilatory status, she was transferred to Internal Medicine for continued observation and management. During her hospitalization in the Internal Medicine service, the patient remained hemodynamically stable, tolerated oral intake, and showed no signs of bleeding or respiratory distress. She was subsequently discharged home with follow-up in the outpatient clinic.

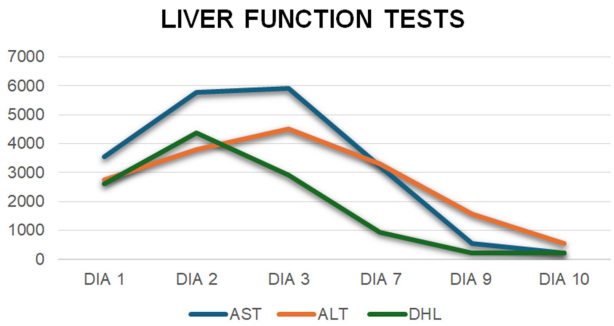

Figure 1. Liver function tests.

Discussion

The diagnosis of leptospirosis presents a significant challenge due to its highly variable and nonspecific clinical presentation, which mimics a wide range of other infectious diseases. This often leads to delays in appropriate diagnosis and treatment, potentially resulting in serious complications and even death.

There are many diagnostic tests available for leptospirosis, but the availability of such tests in low-resource settings is limited. Numerous diagnostic tests based on the detection of nucleic acids or antibodies have been developed for the early diagnosis of leptospirosis, but the serological gold standard remains the microscopic agglutination test (MAT) in paired samples with a fourfold or greater rise, or seroconversion, which confirms the diagnosis. (3)

In a review study conducted in limited-resource countries, it was found that an IgM ELISA test identified an estimated mean IgM sensitivity of 97% (93-100%) and a median specificity of 99% (97-100%). (4)

Regarding treatment, evidence supports the early initiation of antibiotics without waiting for diagnostic confirmation, as this reduces the severity and duration of the disease. For mild cases, doxycycline is the drug of choice, with alternatives such as ampicillin, amoxicillin, or azithromycin in case of contraindication. In severe forms (jaundice, renal failure, pulmonary hemorrhage), intravenous penicillin is recommended; ceftriaxone and cefotaxime are valid alternatives. Antibiotic treatment may trigger a Jarisch-Herxheimer reaction, which is usually self-limiting. (5)

In patients with organ dysfunction, management must include intensive support: intravenous hydration, electrolyte correction, dialysis in oliguric renal failure, and mechanical ventilation if there is respiratory failure. The most common reported causes of death in leptospirosis included respiratory, cardiac, or renal failure and septic shock. (6)

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Conclusion

This case highlights the importance of considering leptospirosis as a probable diagnosis in young patients presenting with a clinical picture of fever and marked elevation of liver enzymes, especially when there is a recent history of exposure in endemic areas or epidemiological history of environmental exposure. The patient's initial evolution, characterized by shock and significant hepatic dysfunction, demonstrates the wide clinical variability of this infection and how easily it can be confused with other common febrile illnesses, thus delaying diagnosis and, consequently, appropriate treatment. Serological confirmation and the timely initiation of antibiotic management, combined with hemodynamic support in the intensive care unit, were key to her recovery. This case shows the importance of maintaining a high diagnostic suspicion and improving the availability of testing and early treatment to decrease complications and mortality related to leptospirosis.

Conflicts of interests

The authors declare that they have no conflicts of interest relevant to the content of this case report. No financial or personal relationships have influenced its preparation or submission.

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