

**CASE REPORT**

## Interesting Case of Leptospirosis Presenting as Jaundice and Acute Renal Failure in North East Tennessee

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### ABSTRACT

Leptospirosis is a worldwide zoonotic infection common in the tropics especially during the hurricanes and floods seasons. Most common clinical presentation is rash, fatigue, weakness, malaise, fever, headache just like viral prodromal symptoms, but clinical presentation of jaundice liver and kidney dysfunction in severe cases can result in multiorgan failure. Diagnosis need serology and cultures which are usually positive early in course of the disease but require special media to grow i.e. Fletcher's media. Treatment is usually with Penicillin or doxycycline. We present a case of leptospirosis presenting with jaundice along with acute liver and renal involvement in the form of Weil's disease which is one of the severe form of presentation. Diagnosis was made by positive leptospirosis serology. Patient was treated with oral doxycycline. Patient had good response to antibiotics with resolution of symptoms on follow up outpatient. *J Microbiol Infect Dis 2018; 8(2):80-82.*

**Keywords:** Leptospirosis, renal Failure, jaundice, Weil's disease

### INTRODUCTION

Leptospirosis is a zoonotic disease of tropics caused by spirochete *Leptospira interrogans* It is mainly associated with exposure to water or urine contaminated with the infected animals or exposure to outdoor activities. It is relatively uncommon in the United States and most of the cases are reported from Hawaii. Weil's Disease and Severe Pulmonary Hemorrhage Syndrome are the most severe presentation associated with high mortality. We present an uncommon case of leptospirosis presented as Weil's Disease in North-east Tennessee.

### CASE REPORT

26-year-old healthy Caucasian male with no significant past medical history was admitted with complaints of generalized non-pruritic rash associated with high grade fever and chills. The patient initially went to urgent care with the same complaints and was treated with IV steroids and sent home on oral steroids. Patient noticed improvement in the rash, but fever persisted which became associated with headache, nausea, vomiting, muscle and joint aches, dark color urine and yellow discoloration of eyes and skin. He denied sick contacts and tick bites. He endorse works mostly outdoors and has been

exposed to mosquitoes and water. On admission, vitals were normal. Physical exam was significant for jaundice, pallor and faint diffuse macular rash sparing palms and soles. Labs showed anemia, thrombocytopenia, elevated total bilirubin, high LDH, fibrinogen and ferritin levels, normal liver enzymes and abnormal renal function with creatinine of 1.41. Urinalysis was positive for urobilinogen >8. Blood cultures, direct and indirect Coomb's test were negative. Peripheral smear showed moderate thrombocytopenia with no schistocytes. Patient had detailed work up for infectious causes of fever and rash including HIV, viral hepatitis panel, EBV, CMV, Monospot test, Dengue fever, chikungunya, Ehrlichia, Anaplasmosis and RMSF which were all negative. CXR was normal. US abdomen showed gall bladder wall thickening and computed tomography (CT) scan of the abdomen and pelvis showed hepatosplenomegaly (Figure 1).

During admission he had worsening kidney function and had elevated liver enzymes as well with elevated direct bilirubin levels. Leptospirosis serology was sent to laboratory with a concern for leptospirosis as he continued to deteriorate

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clinically and not responsive to antibiotics which later came back positive. Patient was started on oral doxycycline with improvement in the symptoms after few days and discharge home. Patient finished 10 days' course of oral doxycycline. On follow up in outpatient ID clinic after 3 weeks, his jaundice, fever and rash had resolved and biochemical markers of liver and kidney dysfunction had normalized as well.

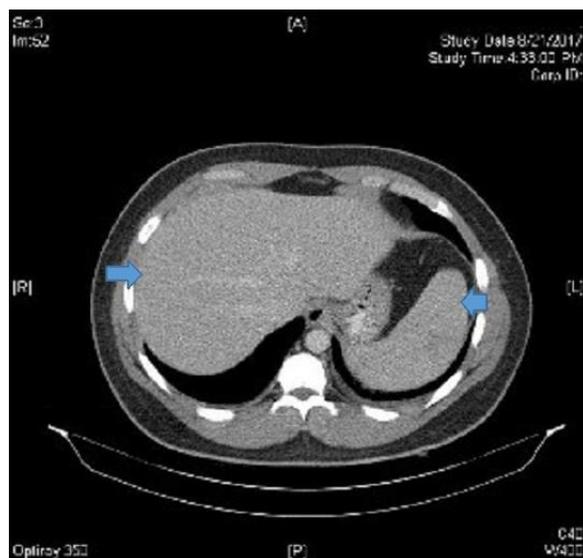


Figure 1. Abdominal Computerized Tomography showed hepatosplenomegaly (Blue arrows).

## DISCUSSION

Leptospirosis is a bacterial infection transmitted from exposure to urine of wild and domestic infected animals or contact with water, soil and food contaminated with urine of infected animal especially rodents. It has also been associated with outdoor recreational activities like hiking, swimming in lakes and biking through infected water and hunting. Our patient also had outdoor exposure as he used to mow grass in lawns and had frequent water exposure as well as exposure to household animals and insects. Leptospirosis is more common in the tropical regions but has been more prevalent in the United States lately and is mostly reported in Hawaii. Puerto Rico and mid-Atlantic area are with greatest number of the cases in Hawaii with incidence of 1.08/100,000 population. Small outbreaks have been reported in Texas and Missouri in the past as well. In Tennessee in 1975, a cluster of seven cases were reported in children swimming in infected water stream [1].

The course of disease is variable, ranging from nonspecific febrile illness and self-limited disease to severe disease with multi organ failure. The clinical picture of the disease can be obscured because of common symptoms with other viral infections like fever, chills, rash, myalgia and headache, low incidence in United States and variable presentation. Our patient's initial presentation was rash only which is slightly unusual but it later culminated into fever with liver and kidney dysfunction.

One of the most severe presentations of leptospirosis is Weil's disease which is characterized by severe jaundice, acute hepatic dysfunction, rapidly progressive renal failure, cardiovascular complication, alveolar hemorrhage, bleeding diathesis and neurological dysfunctions with high mortality rate of 5-10% [2-4]. Our patient had classic Weil's disease with severe jaundice and kidney dysfunction. Sometimes it is very difficult to differentiate it from viral hepatitis and viral hemorrhagic fevers but jaundice along with renal involvement and outdoor activities and water exposure are helpful clues.

Different complications have been reported which are associated with severe disease and include acute respiratory distress syndrome with alveolar hemorrhage, optic neuritis, uveitis, acute liver injury, gastrointestinal bleed, acute kidney injury required dialysis, peripheral neuropathy and rhabdomyolysis [5-9]. Our patient did not meet all these criteria at same time which would have needed more intensive monitoring. Studies have reported that patients with leptospirosis who present with altered mental status and hyperkalemia at admission have high mortality rate and should be closely monitored in the intensive care unit [10]. There is another study that mentioned five factors: dyspnea, oliguria, leukocytosis >12,900, repolarization changes on EKG and alveolar infiltrates that dictate the plan of care and prognosis [11]. Another study reported poor prognostic factors which determine mortality as male sex, alcohol dependence, age >50 years, multi organ failure, acute respiratory distress syndrome and need for mechanical ventilation [12].

Leptospirosis should be considered as one of the differential diagnosis in every patient presenting with fever, rash, myalgias, thrombocytopenia with acute kidney and liver

injury especially clinically evident jaundice. Diagnosis is usually made by serology but different molecular techniques are now available which include micro or macro agglutination test, enzyme-linked immunosorbent assay and polymerase chain reaction. Treatment of the choice is doxycycline or oral azithromycin and for severe disease intravenous penicillin G or cephalosporin [ceftriaxone] is recommended. Our patient had good clinical response to doxycycline with almost normalization of laboratory parameters on follow up. Studies have mentioned that empiric treatment should be started in case of high clinical suspicion as clinical and laboratory diagnosis is not always helpful and can be obscured.

### ACKNOWLEDGMENTS

#### Conflict of Interest:

There is no conflict of interest involved in this case.

#### Financial Disclosure:

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### REFERENCES

- 1) Anderson DC, Holland DS, Fox MD, Patton CM, Kaufman AF. Leptospirosis: a common source outbreak due to leptospire of the grippityphosa serogroup. *Am J Epidemiol* 1978;107:538-549.
- 2) O'Toole SM1, Pathak N2, Toms GC2, Gelding SV2, Sivaprakasam V3. Fever, jaundice and acute renal failure. *Clin Med (Lond)*. 2015; 15(1):58-60.
- 3) Pothuri P, Ahuja K, Kumar V, Lal S, Tumarinson T, Mahmood K. Leptospirosis Presenting with Rapidly Progressing Acute Renal Failure and Conjugated Hyperbilirubinemia: A Case Report. *Am J Case Rep* 2016; 17:567-569.
- 4) Chakrabarti A, Nandy M, Pal D, Mallik S. A rare case of Weil's disease with alveolar haemorrhage. *Asian Pac J Trop Biomed* 2014; 4 (Suppl 1): S66-S69.
- 5) Rathnam SR, Rathnam S, Selvaraj S, et al. Uveitis associated with an epidemic outbreak of leptospirosis. *Am J Ophthalmol* 1997; 124:71-79.
- 6) Wysocki J, Liu Y, Shores N. Leptospirosis with acute liver injury. *Proceedings (Baylor University Medical Center)* 2014; 27(3):257-258.
- 7) Hurst FP, Neff RT, Katz AR, et al. Acute Kidney injury requiring hemodialysis in patients with anicteric leptospirosis. *Clin Nephrol* 2009; 72:186-192.
- 8) Cetin BD, Harmankaya O, Hasman H, et al. Acute renal failure: A common manifestation of leptospirosis. *Ren Fail* 2004; 26:655-661.
- 9) Alventosa Mateu C, Plana Campos L, Larrey Ruiz L, et al. [Gastrointestinal bleeding and acute hepatic failure by leptospirosis: an entity that should not be forgotten]. *Rev Gastroenterol Peru* 2017; 37:96-99.
- 10) Esen S, Sunbul M, Leblebicioglu H, Eroglu C, Turan D. Impact of clinical and laboratory findings on prognosis in leptospirosis. *Swiss Med Wkly* 2004 12; 134(23-24):347-352.
- 11) Dupont H, Dupont-Perdrizet D, Perie JL, Zehner-Hansen S, Jarrige B, Daijardin JB. Leptospirosis: prognostic factors associated with mortality. *Clin Infect Dis* 1997; 25(3):720-724.
- 12) Chawla V1, Trivedi TH, Yeolekar ME. Epidemic of leptospirosis: an ICU experience. *J Assoc Physicians India* 2004; 52:619-22.