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## Introduction

Weil's disease (Leptospirosis) is a relatively common worldwide zoonotic infection due to *Leptospira* spp. However, leptospirosis is underreported due to its low incidence in the United States and its variable presentation. Furthermore, leptospirosis-induced acute hepatic injury is extremely rare. The purpose of this case report is to enlighten urban practitioners to consider testing for leptospirosis in patients with acute liver injury. We are reporting a rare case of leptospirosis-induced acute liver injury.

## Case Descriptions/Methods

A 38 year-old-male with no past medical history presented with 6-day history of fever, abdominal pain, N/V, fatigue and myalgia. The symptoms began one day after playing softball on a heat advisory day. On presentation, the patient's vital signs were normal. The patient was acutely ill-appearing with scleral icterus. There was RUQ abdominal tenderness. Abnormal blood tests of note were: WBC 14.16, ALT 181, AST 232, Bilirubin 7.5 (direct bilirubin 6.2), platelets 41, INR 1.13, PTT 19.7, BUN 33, Cr 3.41, GFR 21.6. An abdominal CT scan revealed hepatic steatosis and hepatomegaly. The investigation for the usual causes of acute hepatitis and sepsis was non-diagnostic. The patient was transferred to the intensive care unit on day 2 for multi organ failure.

The hospital course over the next 4 days was remarkable for an increased WBC 25.22 despite treatment with vancomycin, azithromycin, ceftriaxone and piperacillin/tazobactam, Bilirubin 18, (direct bilirubin >10.0); however, ALT 68, AST 54, platelets 93 improved. The renal function worsened to BUN 58, Cr 4.05, GFR 17.5. *Leptospira* IgM antibody was sent on day 5. The patient's clinical status continued deteriorating and acyclovir was added to the antibiotic regimen. On day 8, *Leptospira* IgM antibody came back positive, and the current antibiotics were discontinued and IV penicillin G was started. On day 12, the patient had significant clinical improvement, WBC 10.16, Platelets 347, ALT 59, AST 44, Bilirubin 4.2, (direct bilirubin 2.6), BUN 20, Cr 1.22, GFR >60. Two weeks after hospital discharge, patient was asymptomatic and his blood test results returned to normal.

## Discussion

In 1886, Dr. A. Weil described a fulminant form of *Leptospira* in sewer workers with Renal failure, Thrombocytopenia, jaundice which was later known to be Weil's disease. Leptospirosis is a worldwide zoonotic infection often resulting from environmental factors such as hurricanes and floods, which are prevalent in the southern USA. The diagnosis can be confirmed by serological tests detecting leptospiral antibodies or through polymerase chain reaction assay.

Pathologists may also perform leptospiral immunohistochemistry staining on liver biopsies for diagnosis, but this must be specifically requested. Treatment of leptospirosis with antibiotics remains controversial. A Cochrane review of 7 randomized clinical trials was inconclusive on the role of antibiotics (penicillin) in leptospirosis, regardless of severity. Nearly 90% of cases are considered mild, and oral doxycycline or amoxicillin may be used. For severe cases, parenteral high-dose penicillin G or ceftriaxone is recommended. The purpose of this report is to remind practitioners of the signs and symptoms of leptospirosis infection so that prompt supportive care and treatment can be started.

## Conclusion

Leptospirosis-induced acute liver injury is exceedingly rare in the United States; hence, a high index of suspicion is required to make the diagnosis due to its variable clinical course. Most cases are mild, while some are severe and potentially fatal. In urban areas, the disease is mainly transmitted via rodent urine contamination of water and soil. With the increase use of various types of cycles, riders of these devices, as well as sewer workers and joggers, risk greater exposure to the disease. Providers, especially in urban settings, should have a high index of suspicion.