

## Acute necrotising pancreatitis and acalculous cholecystitis: A rare presentation of leptospirosis

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### Abstract

Leptospirosis typically presents with fever and thrombocytopenia, with or without jaundice. Acute necrotising pancreatitis and acalculous cholecystitis are rare presentations of this spirochetal infection. Here is the case of necrotising pancreatitis and acalculous cholecystitis associated with leptospirosis in an elderly patient. Leptospirosis was diagnosed by serological tests and abdominal CT imaging. The patient was successfully treated medically with intravenous antibiotics (imipenem and ceftriaxone) and proper hydration.

**Keywords:** Leptospirosis, Pancreatitis, Cholecystitis, Case report.

### Introduction

*Leptospira interrogans*, a spirochete is transmitted to humans through contact of mucous membranes or skin abrasions. Urine from infected animals or contaminated freshwater surfaces, including mud or water in lakes, rivers, and streams is responsible for the infection. Transmission is also possible through ingestion or inhalation of contaminated water or aerosols.<sup>1,2</sup> A wide range of animal hosts including rats and livestock act as reservoir and shed the bacteria through their urine for prolonged periods of time. Leptospirosis is found throughout the world, particularly in high-risk areas such as India, Sri Lanka, Thailand, Vietnam and Malaysia.<sup>3</sup> Risk factors include farming activities, contact with animals (rodents or livestock), floods and freshwater recreational activities<sup>1</sup>. Its presentation varies, from an asymptomatic infection to Weil's disease. Necrotising pancreatitis and acalculous cholecystitis is a rare complication of leptospirosis.

### Case Report

A 83-year-old male presented with fever, abdominal pain and vomiting for 2 days. He was a known case of hypertension, gout and subcortical stroke. On admission, the patient looked ill but was afebrile. His pulse rate was 90bpm and blood pressure 120/80mmHg. On palpation, there was mild

tenderness in epigastrium. Equal breath sounds in all lung fields with bilateral basal crepitations were auscultated. There was no evidence of jaundice, ascites, peritonitis, hepatic encephalopathy or cardiovascular abnormalities.

Investigations showed haemoglobin of 12.4g/dL with a normal haematocrit, slightly elevated white blood cell count ( $11.7 \times 10^9/L$ ), normal platelet count ( $169 \times 10^9/L$ ) and ESR of 82mm in 1st hour. Blood urea was 30.5mg/dl. Serum creatinine was 1.57mg/dl. Corrected calcium was 8.6mg/dl, serum bilirubin was 0.91mg/dl, AST 49 U/L, ALT 66 U/L and ALP 101 U/L. Serum creatine kinase and lactate dehydrogenase was within normal range. Serum amylase was 820 U/L (normal up to 125U/L), urine diastase was 293 (normal - 80 to 150). Arterial blood gases were normal. Leptospiral Immunoglobulin M (IgM) was detected on the third day of admission (microscopic agglutination test titre 1:200). Urine and blood cultures did not grow any organisms after 5 days. Abdominal CT scan revealed a patchy area of non-enhancement at the pancreatic head region, representing an area of necrosis and streaky peripancreatic fat. There was ill defined fluid collection present inferior, posterior and anterior to the pancreatic head and neck. There were no stones in gallbladder, pancreatic duct or biliary tree, but pericholecystic fluid was seen with enhancement of the gallbladder wall.

He was diagnosed as a case of necrotizing pancreatitis and acalculous cholecystitis, most likely due to leptospiral infection. The patient improved with supportive measures and intravenous Imipenem 500 mg TDS for 1 week, followed by intravenous ceftriaxone 2g OD for 1 week. He was kept nil-by-mouth for 3 days and was on fluid restriction under close observation and given intravenous pantoprazole 40mg OD. The abdominal symptoms improved a day after admission. His renal and liver functions were improved but the platelet count remained the same. The amylase level came down to 98U/L on the third day of admission.

Patient was discharged after 2 weeks of admission. Abdominal CT scan after 10 days of discharge revealed reduction in fluid collection and peripancreatic streaking with resolution of cholecystitis. Leptospiral serology was repeated and was negative. The patient provided written consent to publish the case report.

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## Discussion

Leptospirosis is thought to cause systemic vasculitis<sup>2,4,5</sup> in which inflammation of the vascular walls may be a consequence of the direct invasion of the infectious agent or of immune mechanisms such as immune complex deposition, auto-antibodies or cell-mediated immunity. It typically occurs as two clinically recognizable syndromes: the anicteric leptospirosis (80-90% of all cases) and the remainder icteric leptospirosis.<sup>2</sup> A retrospective study shows that non-specific symptoms are the commonest presentation.<sup>6</sup> Pancreatitis and acalculous cholecystitis have been described as an uncommon complication of leptospirosis in a number of case reports.<sup>7,8</sup> The mechanism of acute pancreatitis or acalculous cholecystitis in Leptospirosis still remains unclear. Vasculitis and ischaemic injury, causing activation of proteolytic enzymes and auto-digestion is a probable mechanism for the development of pancreatitis.<sup>9</sup>

Microscopic agglutination test (MAT) is considered to be the "gold standard" for diagnosing leptospirosis. Serology for IgM may produce false positive results.<sup>10</sup> Blood culture can provide proof of diagnosis, but takes many weeks to grow and the test is only useful in the first 10 days of illness, after which leptospire begin to disappear from the blood, and sero-diagnosis should be used.<sup>3</sup> Whereas molecular diagnosis such as PCR will be useful only in the first 7 days of illness (during the bacteraemic phase).<sup>10</sup>

For the diagnosis of acute pancreatitis, the enzymes lipase and elastase-I are known to show the highest specificity for the diagnosis of pancreatitis. Hyperamylasemia can be seen due to renal function alterations or other unknown reasons but it has been suggested that a serum amylase level higher than twice the normal value could not be explained only by renal failure.<sup>7</sup> In this case, the serum amylase was increased more than fourfold of normal level. In terms of imaging, CT scan is the "gold standard" in diagnosing acute pancreatitis or necrotizing pancreatitis. This diagnostic test has 100% specificity and over 90% sensitivity for this disease.<sup>2</sup> The acalculous cholecystitis was an incidental finding from the CT scan. Thrombocytopenia, hepatic and renal impairment and jaundice are common findings in leptospirosis,<sup>2</sup> but these were not seen in this patient.

In terms of treatment of leptospirosis, doxycycline, ampicillin, amoxicillin, erythromycin, and azithromycin are recommended for mild cases; whereas benzylpenicillin, ampicillin, cefotaxime, and ceftriaxone are recommended for severe cases.<sup>1,8</sup> In this case, the patient was initially treated with Imipenem then de-escalated to ceftriaxone. A study on antimicrobial susceptibilities of geographically diverse clinical human

isolates of *Leptospira* suggested that regional differences in susceptibility may exist, and that a more extensive study to look for geographic variability should be pursued.<sup>11</sup>

For treatment of acute necrotizing pancreatitis, it is general understanding that infected pancreatic necrosis should be managed surgically. However, a study evaluating the role of conservative management in necrotizing pancreatitis supported conservative management with early antibiotic treatment (Imipenem-Cilastin was used in the study) in patients with sterile pancreatic necrosis.<sup>12</sup> In infected necrotizing pancreatitis on the other hand, surgical intervention is preferable. In this case, the patient was successfully managed conservatively with intravenous antibiotics, hydration and nutrition.

## Conclusion

This case highlights important manifestations of leptospirosis and clinicians should consider acute pancreatitis or acalculous cholecystitis in patients with leptospiral infection, presenting with abdominal pain.

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