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Acalculous cholecystitis: A rare presentation of leptospirosis progressing to Weil's disease

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ABSTRACT

Leptospirosis is a zoonotic infection with higher incidence in tropics. Leptospirosis, is known for its variable manifestations, and is a clinical challenge for physicians in the tropics. Experienced clinicians, at times can mistake leptospirosis for non-medical conditions. A few reports of leptospirosis presenting as acalculous cholecystitis was found in review of literature. We intent to highlight acalculous cholecystitis as a rare but clinically significant presentation of leptospirosis.

1. Introduction

Leptospirosis is a zoonotic infection with higher incidence in tropics, caused by the pathogenic spirochete belonging to the genus *Leptospira*, family Leptospiraceae, and order Spirochaetales[1]. The epidemiology of leptospirosis has modified and is increasingly identified as one of the emerging infectious disease worldwide. This may be due to changes in animal husbandry, climate, sanitation, changes in environment and human behaviour[2]. The commonest form of the disease, leptospirosis is the self-limiting and nonfatal, but its severe form Weil's disease results in multi-organ failure and has high mortality[1, 3]. We present an uncommon presentation of leptospirosis, acalculous cholecystitis, in this report.

2. Case report

A 30 year old man, a manual labourer, presented with complaints of fever of 3 days and right upper abdominal pain with associated vomiting of 1 day duration. He also gave history of malaise, body aches and myalgia of 3 days. On clinical examination he was febrile, had muscular tenderness, mild dehydration. He was hemodynamically stable and examination of abdomen showed mild tenderness in the right hypochondria. Other systemic examinations were within normal limits. Investigations done showed total leukocyte count was 11 300/dL with 72% neutrophilia and platelet count was 150 000/dL. His serum bilirubin was 2.8 mg/dL(direct being 1.8 mg/dL), SGOT/SGPT were 48 IU/64 IU, alkaline phosphate and GGTP were 2 014 IU and 400 IU respectively. Routine examination of urine was normal. Sonogram of the abdomen showed distended gall bladder with sludge. With the clinical features and investigations, provisional diagnosis of acalculous cholecystitis was made. He was started on intravenous crystalloids and supportive care; had no improvement of symptoms.

On day 3 he developed sub conjunctival haemorrhages, purpura, severe myalgia and slipped into hypotension, followed by anuria and respiratory distress. On reassessment, diagnosis of leptospirosis – Weil's disease was established; as he fulfilled the modified Faine's criteria[4].

The repeat blood counts were 12 800/dL and platelets were 20 000/dL. Urine analysis showed albumin +++, with RBC and WBC casts. Urine dark ground microscopy showed no *Leptospira*, but Ig M and PCR for *Leptospira* were positive [5]. The serum bilirubin was 7.8 mg; alkaline phosphate – 880 IU; urea – 68 mg; creatinine – 2.4 mg; CPK – 3 300 IU; and serum potassium – 6.2 mEq /dL. He was started on assisted ventilation, hemodialysis, intravenous crystalline penicillin, hydrocortisone, platelet transfusions and other supportive measures.

There was a gradual improvement and was weaned of assisted ventilation on day 7. He was discharged from hospital on day 9 with mild jaundice, near normal renal functions and good urine output.

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3. Discussion

Leptospirosis has emerged as a leading infectious disease worldwide. It is increasingly recognised as a recreational disease in the western world. It still remains as an occupational disease in the tropical countries affecting the lower socioeconomic strata[1-3]. The spirochete enters the humans through the mucous membranes or abraded skin on contact with contaminated water from environmental sources. The leptospira rapidly multiplies in the blood and spreads rapidly to other tissues.

Leptospirosis is known to be a great masquerade, for its variability in its clinical features. Katz AR *et al*[6] retrospectively assessed the clinical presentation and treatment of 353 cases of laboratory-confirmed leptospirosis in Hawaii during 1974 to 1998, and found non-specific symptoms as the commonest presentation. Most of the atypical presentations go undetected in early stages of the disease. We have reported a rare case of leptospirosis presenting with Sweet's syndrome and central nervous vasculitis[7].

Acalculous cholecystitis is an uncommon presentation of leptospirosis, and the pathogenesis could be immunogenic reaction against the infiltrating *Leptospira* in the gall bladder. Gross examination of the gall bladders removed at surgery in cases of leptospirosis presenting as cholecystitis, had no calculi but revealed bile stained thickened walls with smooth serosal surface[8]. Guarner J[8] by histopathological study of gall bladder showed sub-mucosal mononuclear infiltration with oedema and positive immune-histochemistry for *Leptospira*; and even found spirochete in one specimen. They suggest pathologic studies for leptospirosis on formalin-fixed, paraffin-embedded tissues, if cholecystectomy is done in febrile patients with suspicious environmental or animal exposure.

Leptospira have a rich content of adhesins endowed with multifunctional biological activities. These include the pathogens adhesion to host tissue components, plasminogen activation, and its resistance to complement. There are more studies to be done to understand the pathogenesis of leptospirosis[9].

The simplest method for diagnosis of leptospirosis is identifying motile spirochetes in urine by dark ground microscopy. The more definitive tests for leptospirosis is by PCR, culture of blood or urine, and or a positive microscopic agglutination test or detecting Ig-M against leptospira[1,3,7,8,10]. Our patient had positive IgM and PCR for leptospira and also fulfilled the modified Faine's criteria for the diagnosis of leptospirosis[5].

A few case reports, of leptospirosis presenting as acalculous cholecystitis were found in review of literature[11,12]. Vilaichone RK in his report of three cases could not identify *Leptospira* in the surgically removed gall bladder but could get rising titres by serology . Three case reports of acalculous cholecystitis associated with pancreatitis were found in literature, and our patient did not have evidence of pancreatitis[13-15].

The disease can be treated with doxycycline, penicillin, ceftrioxone or azithromycin; and prevented by administering doxycycline as prophylaxis in individuals at risk[16-18]. The controversy remains on the management of *Leptospira* induced acute cholecystitis by surgical or medical therapy. In review of literature we were unable to get enough data to support[19]. We believe that appropriate and early institution of antibiotics would be sufficient to manage acalculous cholecystitis due to leptospirosis rather than cholecystectomy.

We indent to highlight acalculous cholecystitis as a rare but significant clinical presentation of leptospirosis, which would result in adverse outcome. At times, clinicians from tropics mistake leptospirosis for non-medical conditions and surgical treatment is initiated. Early institution of antibiotics would be sufficient to treat acalculous cholecystitis due to leptospirosis rather than cholecystectomy.

Conflict of interest statement

We declare that we have no conflict of interest.

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