DOI: 10.4149/BLL_2022_114

Bratisl Med J 2022; 123 (10)
716 – 718

CLINICAL STUDY

A rare case of acute acalculous cholecystitis secondary to hantavirus infection with renal syndrome

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ABSTRACT

Hantaviruses are single-stranded RNA viruses. They are transmitted to humans by rodents and insectivore hosts. Some Hantavirus subtypes are the causative agents of haemorrhagic fever with renal syndrome (HFRS), which is characterized by fever, thrombocytopenia, and acute kidney injury. Hantavirus infection is difficult to diagnose due to its non-specific clinical symptoms. Causes of acalculous cholecystitis are severe trauma or burn, surgery, long-term starvation and some viral infections. It is very rare for Hantavirus to cause acute acalculous cholecystitis. The treatment of acute acalculous cholecystitis is usually directed towards its symptoms. A 22-year-old male forest worker was admitted to our emergency outpatient clinic with the complaints of fatigue, oliguria, fever, abdominal pain and vomiting. After the clinical and laboratory examinations, HFRS and acute cholecystitis secondary to Hantavirus infection were diagnosed. The patient's condition and clinical findings improved after supportive treatment. Hantavirus infection should be considered in patients with acute kidney injury, cholecystitis and thrombocytopenia *(Fig. 2, Ref. 10)*. Text in PDF *www.elis.sk*
KEY WORDS: Hantavirus, acute kidney injury, acalculous cholecystitis, thrombocytopeni.

Introduction

Hantaviruses are enveloped, RNA viruses that belong to the Bunyaviridae family. Humans may become infected with Hantaviruses through aerosolized excreta inhalation and contact infection by rodent urine, saliva, or feces (1). These pathogens are associated with two severe forms of acute febrile illness: haemorrhagic fever with renal syndrome (HFRS) and Hantavirus cardiopulmonary syndrome (HCPS). Mortality rates after infection with Hantaviruses in literature have been reported to be 12 % (HFRS) and 40 % (HCPS) (1, 2).

Viral cellular damage plays a fundamental role in the immunopathology of Hantavirus infection. After Hantaviruses infect microvascular endothelial cells, they change the barrier properties of these cells by various immunological mechanisms. They cause vasodilation and haemorrhagic congestion by creating vascular permeability with damage to capillary and small vessel walls in the target organ (1, 2, 3). This is the mechanism of formation of pleural effusion and perirenal fluid collection.

Acute acalculous cholecystitis is an acute inflammation of the bladder without bile stones or bile sludge. Hantavirus is a rare cause of acute acalculous cholecystitis, and it is recommended to avoid unnecessary surgical interventions (4,5). Here, we present a rare case of HFRS accompanied by acalculous cholecystitis secondary to Hantavirus infection, which was successfully treated.

Case

A 22-year-old, male forest worker was referred to our emergency unit with complaints of sore throat, fever that started 6 days ago and development of new ones including abdominal pain, vomiting, blurred vision, nausea, and oliguria. The patient's and his family history were unremarkable, and he was using analgesics and antipyretics. His blood pressure was 130/80 mm Hg and his body temperature was 38 °C. Physical examination revealed conjunctival hyperemia, petechiae in his body and tenderness on abdominal palpation. Initial laboratory results were as follows: white blood cell count: 13500/μL (3.57–11.01), aspartate aminotransferase: 69 U/L (0–40), lactate dehydrogenase: 302 U/L (135–225), urea: 122 mg/dL (19–49), erythrocyte sedimentation rate: 28 mm/h and C-reactive protein: 62.37 mg/L (< 5). The platelet count and albumin level were low at 22000 μL and 31.2 gr/L respectively. The other results of the biochemical and haematological parameters were within normal limits. In urinalysis, urine density was 1.047, and protein (2+) was present. The chest and abdominal X-rays were normal.

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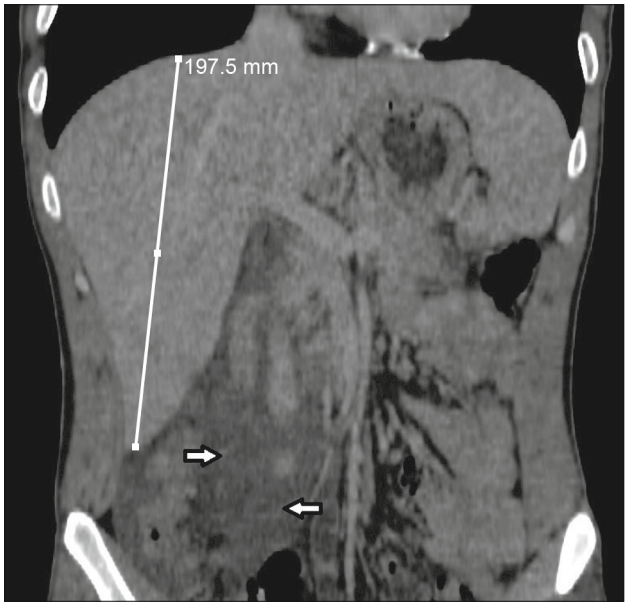

Fig. 1. Coronal CT of the abdomen shows hepatomegaly and abdominal free fluid (arrows).

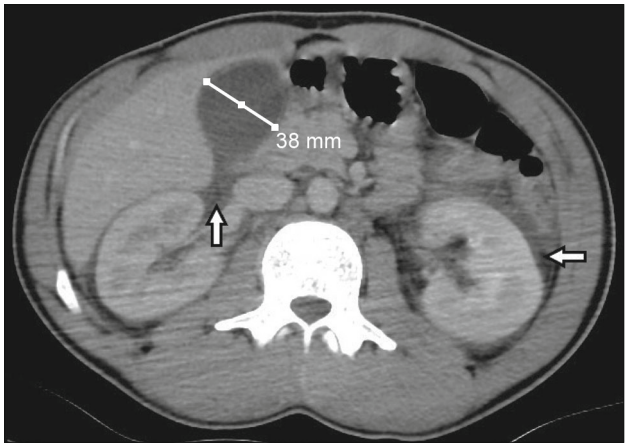

Fig. 2. Axial CT of the abdomen shows gallbladder to be slightly hydropic. Bilateral perirenal free fluid is also seen (arrows).

Despite the intravenous hydration, the creatinine value increased to 1.69 mg/dL and the abdominal pain persisted. Therefore, the patient underwent an abdominal ultrasound (US) and abdominal computed tomography (CT). In the US performed, it was observed that the echogenicity of both kidney parenchyma increased (Grade 2) and there was a perirenal free fluid. Abdominal CT revealed hepatomegaly (maximum craniocaudal diameter 197.5 mm), free fluid in the perirenal area and other abdominal compartments (Fig. 1). In addition, the transverse diameter of the gallbladder was measured 38 mm and was reported as the close to the upper limit of normal. The wall thickness of the gallbladder was normal (Fig. 2).

During the follow-up in the emergency unit, the patient's creatinine level increased to 2.33 mg/dL; haemoglobin and platelet count decreased to 10.7 g/dL and 17000 μL respectively. The patient was admitted to our nephrology clinic to investigate the aetiology of acute kidney injury, thrombocytopenia and abdominal pain. Antineutrophilic cytoplasmic antibodies (p-ANCA, c-ANCA), antiglomerular basement membrane antibody, antinuclear antibody and hepatitis markers were negative; C3, C4, Ig A, Ig G, Ig M and lupus anticoagulant were all normal. Urinary protein excretion was 541 mg/day. No abnormality was found in reticulocyte, haptoglobin, direct and indirect Coombs tests performed due to decreased haemoglobin. The erythrocytes were normochromic normocytic and two or three single platelets were seen in each area, but no atypical cells were seen in the peripheral blood smear.

While following up, Murphy positivity was detected in the patient's right upper quadrant. On US examination, the gallbladder was hydropic (42 mm transverse diameter), and the wall thickness was increased (4.5 mm). In addition, widespread abdominal free fluid reaching 7.5 cm at its deepest point was observed. Clinical and radiological findings were consistent with acute cholecystitis.

The patient's blood and urine cultures were negative, but his fever continued despite the treatment with 3x1 gr intravenously meropenem in accordance with the suggestion of the department of infectious diseases. Thereupon, the patient was suspected of Hantavirus infection; the immunofluorescence assays for Hantavirus IgM and IgG were positive. Since Hantavirus subtypes were not studied in our hospital, Hantavirus typing could not be performed in our case.

On the 10th day of the follow-up, the patient's complaints regressed, acute phase reactants, haematological and biochemical parameters returned to normal. On US performed two months later, hepatomegaly and intraabdominal fluid were not detected and the cholecystitis findings improved.

Discussion

Hantaviruses are rodent-borne viruses causing zoonotic diseases. Forest villagers and workers are more likely to get Hantavirus infections because forests contain rodent species that carry this virus. The diagnosis of Hantavirus infections is made by demonstrating the presence of virus-specific IgM in the patient's serum or by detecting specific IgG in the serum during convalescence. Hantavirus infection can also be confirmed by detecting the Hantavirus genome in blood or serum samples by RT-PCR (1,2).

Some of the subtypes of Hantavirus cause HFRS. One of the most affected target organ is the kidney, and an infection often results in acute renal failure (1,6). In the present case, creatinine increased from the normal range to 2.86 mg/dL. The course of classic HFRS has five phases: febrile, hypotensive, oliguria, polyuria, and convalescence. After an incubation period of 2–4 weeks, high fever, nausea, vomiting, abdominal pains, headache, and visual disturbances can appear. In the febrile phase of the disease, thrombocytopenia and leukocytosis may accompany (2). Petechiae and conjunctival haemorrhage may occur due to thrombocytopenia as in our case.

Regarding the pathogenesis of Hantavirus, plasma leakage occurs with various mechanisms due to the infection of endothelial cells. This presents itself as pleural effusion and perirenal fluid accumulation (1). In the case presented here, widespread intraabdominal free fluid was observed, including the perirenal area.

Hepatosplenomegaly may develop throughout the course of Hantavirus infection (7). During the follow-up of the patient, hepatomegaly regressed.

The oedematous changes that occur in organs such as kidneys and lungs can sometimes develop in the gallbladder (8). Kim et al showed that gallbladder wall thickness above 4 mm in patients with HFRS is associated with the severity of the disease (9). In our case, the gallbladder was hydropic and the wall thickness was 4.5 mm. In literature, there have been cases of acalculous cholecystitis caused by Hantavirus and showing a complete recovery without cholecystectomy (4, 5, 8, 10). The most effective approach to the management of Hantavirus infections is to give priority to preventive measures and a good supportive care. There is no FDA-approved drug or vaccine for its treatment yet (1, 2). In our case the patient was successfully treated with supportive treatment.

Conclusion

Hantavirus infection should be considered in the differential diagnosis of the patients, who present with fever, acute kidney injury, thrombocytopenia, hepatosplenomegaly and accompanying cholecystitis. The occupation of the patients, the history of travel to the endemic regions, contact with rodents or their secretions should be questioned. When the diagnosis is made correctly, the disease can be managed with conservative treatment.

Informed consent was obtained from the patient for the publication of this case report.

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Received April 14, 2022.
Accepted May 25, 2022.