A rare cause of acute pancreatitis: Hantavirus infection

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Abstract

Hantaviruses cause potentially fatal two different systemic infectious diseases in humans named as hemorrhagic fever with renal syndrome (HFRS) and Hantavirus pulmonary syndrome. The clinical features of HFRS are hemorrhage, fever, thrombocytopenia and acute renal insufficiency frequently observed. HFRS shows distinctive clinical manifestations throughout from acute influenza-like febrile illness to shock. Although a large portion of HRFS patients present with a complaint of abdominal pain, acute pancreatitis is a rare complication of HFRS. No specific treatment protocol has been described for HRFS and supportive treatment is the basic approach. The rate of success enhanced with early diagnosis and intensive care support. Clinicians should be alert to the HFRS in patients with acute pancreatitis associated with systemic viral infection. We describe a case with HFRS who has presented with acute kidney injury, thrombocytopenia and acute pancreatitis. The patient was treated by supportive management successfully. (Acta gastroenterol. belg., **2017**, 80, **59-61**).

Key words : hantavirus, hemorrhagic fever with renal syndrome, pancreatitis.

Introduction

Acute pancreatitis is defined as an acute inflammatory process of the pancreas that may also involve peri-pancreatic tissues. Viral pathogens, such as Coxsackie virus, human immunodeficiency virus and Hantaviruses, are relatively rare causes of acute pancreatitis, which is easy to disregard (1). Hantaviruses are single-stranded and enveloped RNA viruses belonging to the Bunyaviridae family. They lead mainly two different types of diseases including hemorrhagic fever with renal syndrome (HFRS) and Hantavirus pulmonary syndrome (2). HRFS is characterized by fever, bleeding tendency, gastrointestinal symptoms and renal failure. Although abdominal pain is a common initial symptom in patients with HFRS, acute pancreatitis is a rare find (2.8%) among the various complications of HFRS (2). We describe a clinical case with HFRS associated with acute pancreatitis and treated successfully by intensive care support.

Case report

A 44-year-old male patient referred to the emergency department for high fever persisting for the last three days with cough and myalgia. Temperature was 39.5 °C and chest radiography was normal. Laboratory test results are shown in Table 1. High-sensitive CRP (3.09 mg/l) and urine analysis were in normal range. He was diagnosed with upper respiratory tract viral infection and discharged from emergency department with symptomatic treatment. He applied to internal medicine outpatient clinic two days later when nausea, vomiting and abdominal pain developed. The patient was hospitalized. Blood, urine, feces and oropharyngeal cultures were performed and ampicillin + sulbactam combination treatment was started. Platelet values decreased progressively and anuria occurred on the third day of hospitalization. The patient was transfer to the intensive care unit due to a respiratory distress. Chest X-ray revealed an infiltration and increased density in the inferior right lobe. Blood and urine cultures results were negative. On the next day, the patient complained about severe abdominal pain, nausea and vomiting and blood test had shown approximately four-fold increase in lipase compared with the previous day. These findings lead to the diagnosis of acute pancreatitis. There were hepatomegaly and splenomegaly in abdominal ultrasound. Gallbladder and bile duct were normal but pancreas could not be assessed due to the dense gas artefact in abdominal ultrasound. Cholelithiasis and cholangitis due to the obstruction of biliary tree by gallbladder stones were excluded. Computed tomography (CT) of the thoraco–abdominal region revealed pleural effusions, increase of peritoneal liquid and edema of the pancreas and peripancreatic tissues suggesting pancreatitis. There was not alcohol consumption or drug use in patient's history. Patient was living in rural area and he had a history of contact with mice. Based on the clinical manifestation, epidemiologic data, and laboratory parameters, HFRS was suspected.

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Table 1. — **Patient's laboratory test results at the admission to the emergency department and during hospital stay**

	Hg (g/dL)	WBC count (x10³/µL)	Platelet count (x10³/µL)	Urea (mg/dL)	Creatinine (mg/dL)	AST (U/L)	ALT (U/L)	Amilase (U/L)	Lipase (U/L)
ED	15.6	3.6	135	29	1.06	30	21	56	47
Day 1	15.9	5.2	51	33	0.85	73	32	49	43
Day 3	16.1	13.5	25	125	3.69	61	29	75	48
Day 4	14.8	11.2	19	135	4.87	58	28	61	57
Day 5	11.9	6.9	20	176	6.28	55	26	112	200
Day 6	11.3	5.8	67	132	6.47	41	20	226	375
Day 7	10.8	5.4	85	117	6.35	33	23	385	578
Day 8	11.0	5.2	90	138	6.37	25	20	498	716
Day 9	11.1	6.1	104	129	6.35	31	17	658	815
Day 10	10.6	5.9	138	148	6.70	24	15	731	855
Day 11	10.4	5.8	155	121	5.67	18	10	921	877
Day 12	10.8	8.0	143	93	4.37	22	11	1025	985
Day 13	10.5	6.8	155	118	4.54	20	11	1100	998
Day 14	10.5	7.0	142	138	4.09	19	11	985	874
Day 15	9.8	8.1	171	154	3.33	18	11	845	651
Day 16	9.3	6.9	170	120	2.40	16	10	678	589
Day 18	9.3	6.9	198	66	1.59	24	17	465	426
Day 21	9.7	4.7	169	36	1.42	23	17	326	330
Day 22	10.0	3.9	147	49	1.47	24	17	198	234
Day 23	11.2	3.5	129	37	1.49	25	20	153	128
Day 24	11.9	4.2	133	44	1.37	38	29	85	74

Hg: Hemoglobin, WBC: White blood cell, AST: Aspartate aminotransferase, ALT: Alanine aminotransferase, ED: Emergency department

We tested patient for HFRS and immunoglobulin M antibodies specific to Hantavirus detected by enzyme-linked immunosorbent assay was found to be positive. The main treatment during hospitalization was supportive therapy. Platelet suspension was administered for thrombocytopenia before the hemodialysis catheter placement. Hemodialysis was performed in intensive care unit due to anuria and development of respiratory distress due to the volume overload. Urination began following hemodialysis and the need for hemodialysis went away. Patient's general status improved. He was discharged with full recovery when his complaints regressed and laboratory findings recovered in follow-ups.

Discussion

Gallstones and alcohol are the main causes of acute pancreatitis (3). Infrequent causes of the pancreatitis are drug reaction, pancreatic and ampullary tumors, hypertriglyceridemia, hypercalcemia, hypothermia, congenital anomalies of pancreatic and biliary anatomy, trauma, infections, parasitic organisms, and poisons of some spiders (4). Abdominal pain, nausea and vomiting are the most common symptoms of pancreatitis. Clinical manifestations range from mild epigastric discomfort to critical illness and death. The diagnosis is based on clinical presentation in association with increased pancreatic enzymes, and radiologic studies (4).

Hantaviruses are one of the rare causes of acute pancreatitis. Approximately 45 Hantavirus types have been isolated and at least 20 have been identified as infectious agents in humans. The species that cause HFRS have not been shown to transfer from human to human. Hantaviruses mostly cause asymptomatic but chronic infections in rodents and rodents spread the virus through urine and feces. Transmission by inhalation of aerosolized rodent excreta such as feces and urine remains the only known way the virus is transmitted to humans. The vector of Hantavirus is hispid cotton rat (Sigmodon hispidus) lives in South America, Central America and southern North America. This rodent lives in rural areas and poses a danger to people when it reaches the city.

Incubation time of HFRS is two to four weeks in humans before symptoms of infection present. The clinical course may be mild, moderate or severe depending on the type of the virus and viral load (6). The pathogenesis of Hantavirus infections is unclear. In HFRS, there is increased vascular permeability

and decreased blood pressure due to endothelial dysfunction and the most dramatic damage is seen in the kidneys. Potential mediators, which increase vascular permeability, are tumor necrosis factor alpha, interleukin 1 and 2, and nitric oxide (7). Retroperitoneal oedema and free liquid accumulation in the body cavities with hemoconcentration reflect the vascular failure in HFRS. Increased vascular permeability raises the possibly of increased protein loss via the intestinal tract (7).

Patients with HFRS show hemoconcentration, leukocytosis and thrombocytopenia; proteinuria, hematuria and pyuria in urinalysis and increased levels of alanine aminotransferase, aspartate aminotransferase, lactate dehydrogenase and creatinine kinase in biochemical tests (8).

Five clinical phases have been defined following incubation including febrile, hypotensive, oliguric, diuretic and convalescent periods (2). Febrile phase lasts for 3-5 days and is manifested with signs similar to acute influenza infection. There may be additional signs including nausea, vomiting, myalgia and abdominal pain. Abdominal pain is observed in 90% of patients with HFRS (5). Sudden proteinuria arises after three to five days. Shortly after these complaints, a decrease in platelet count, renal dysfunction, blurry vision, respiratory distress, cough and bleeding of the skin and mucosa may be seen. Febrile phase is followed by the hypotensive phase that may last for several days. One third of deaths occur during this phase due to shock, while half of them take place due to renal failure during the oliguric phase. In 10-15% of the cases, the clinical picture is severe and the rate of death is 6-15% (9).

Immunofluorescent antibody test, enzyme immunoassay and immunoblotting tests from plasma samples are frequently used methods for laboratory diagnosis in patients that suspected Hantavirus infection clinically (10).

No specific treatment protocol has been described for HFRS. Supportive treatment is the basic approach and natural recovery from the virus is possible with supportive treatment. The rate of success enhanced with early diagnosis and intensive care support. Still no antiviral drug is present that has a fully proven efficacy. However, ribavirin has been shown to be effective against Hantaviruses (11). Some studies indicate that ribavirin decreases mortality and morbidity in patients with HFRS (11).

In conclusion, one of viral agents that cause acute pancreatitis is Hantaviruses. Although a large portion of HRFS patients present with a complaint of abdominal pain, acute pancreatitis is a rare complication of HFRS. Diagnosis of acute pancreatitis in patients with HFRS is the same as other causes. Supportive treatment is the basic approach for acute pancreatitis in HFRS.

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