



Orthohepevirus C (Rocahepevirus Ratti): A New Human Threat

Ortohepevirüs C (Rocahepevirüs Ratti): Yeni Bir İnsan Tehdidi

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Dear Editor;

Orthohepevirus C, currently known as Rocahepevirus ratti, is an RNA virus belonging to the Hepeviridae family and can cause hepatitis E infection in mammals. Rocahepevirus ratti is commonly found in various animals, including humans, and is also referred to as "animal hepatitis E" (1).

Orthohepevirus includes 4 species according to ICTV: Orthohepevirus A [Paslahepevirus balayani-hepatitis E virus (HEV)], B (Avihepevirus-a-HEV), C (Rocahepevirus ratti), and D (Chirohepevirus-Ch-HEV). Orthohepevirus A, known as HEV. According to their genome sequences, HEVs are divided into 8 main genotypes. Genotypes 1 and 2 may be limited to humans through consumption of fecal contaminated water in Asian and African countries, while genotypes 3-8 are zoonotic agents with a worldwide distribution among humans and a large number of mammals through consumption of raw or undercooked meat (1).

The other 3 Hepeviridae genus appeared devoid of zoonotic threat and their circulation appeared restricted to their main hosts: Orthohepevirus B in birds, Orthohepevirus C in mustelids and rodents, and Orthohepevirus D in bats. However, in 2018, a case of rat HEV infection was reported in a liver transplant recipient in Hong Kong, after which 7 more cases of episodic human Rocahepevirus

ratti infection were identified in a large scan in the same setting. Subsequently, the number of cases have increased above 20 in Asia and Europe (1,2).

Rocahepevirus ratti can be transmitted in different ways depending on the economic conditions, sanitation conditions, and hygiene practices of the countries. It is usually spread through the consumption of contaminated water or food. It can also be transmitted through contact. Rocahepevirus ratti infection is often mild or asymptomatic. However, in some cases, the infection can lead to liver damage and chronic hepatitis E. Chronic HEV infection can cause serious liver problems, particularly in people with compromised immune systems. There is no cure for Rocahepevirus ratti, but symptomatic treatments are available. Liver transplantation may be required in cases of chronic hepatitis E, particularly in people with compromised immune systems (3,4).

The genomic structure of Rocahepevirus ratti consists of an RNA molecule with a length of about 7.2-7.5 kilobases. This RNA molecule is divided into three regions called open reading frames: ORF1, ORF2, and ORF3. ORF1 encodes a protein called a polyprotein and contains the enzymes needed for the virus to replicate and multiply. ORF2 encodes a protein called the capsid protein and forms the outer surface of the virus. ORF3 encodes a protein that plays a role in virus replication (1,2,3).

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Rocahepevirus ratti showed signs of hepatitis in infected animals. These can include symptoms such as liver damage, jaundice, diarrhea, and inflammation of the liver. People can become infected with Rocahepevirus ratti and show symptoms similar to HEV infection (1,2,3,4).

There was no specific treatment against Rocahepevirus ratti. However, vaccines are being developed to prevent infection. To prevent Rocahepevirus ratti infection, access to clean water and hygienic living conditions are recommended (1,2,3,4).

Laboratory diagnosis of Rocahepevirus ratti infection is made through the analysis of clinical samples such as blood, serum, urine, stool, liver biopsy, bile samples, and other body fluids from a patient with symptoms of the disease caused by the virus.

The diagnosis of Rocahepevirus ratti is usually made by serological tests and molecular methods. Serological tests (ELISA and Western blot) determine the presence of the virus based on antibodies. However, these tests may be insufficient in the early stages of the disease, as antibodies are formed weeks and months after infection. Molecular methods, especially polymerase chain reaction-based tests, can detect Rocahepevirus ratti RNA very sensitively and give results even in the early stages of infection (1,2,3,4,5). However, the diagnosis of Rocahepevirus ratti infection should be made by a holistic assessment based on clinical signs and other laboratory tests.

Rocahepevirus ratti and HEV can sometimes be confused and cause similar symptoms. However, these two viruses belong to different virus families and have different genetic makeups (2,3,4).

The infection symptoms of both agents are similar: weakness, loss of appetite, abdominal pain, nausea, vomiting and jaundice. However, differences can be seen during the disease and their treatments are also different.

Rocahepevirus ratti infection is usually self-limiting and most people get over the disease without realizing it. However, in some cases, it can become chronic and cause liver damage. HEV infection is likewise transient on its own, but can have serious consequences in pregnancy and in people with chronic liver disease (1,2,3,4,5). Because the recent zoonotic potential of Rocahepevirus ratti, the associated syndromes and risk population need to be clarified.

To summarize, Rocahepevirus ratti and HEV belong to the same virus family (hepeviridae), can cause similar symptoms and can be confused with each other. Therefore, the specific molecular diagnosis should be applied for HEV and Rocahepevirus ratti. There is no current cure for HEV and Rocahepevirus ratti. Therefore, the type of infection does not much change treatment or clinical management much.

Rocahepevirus ratti has currently only been identified in Hong Kong, Spain, and France (1). Risk factors for Rocahepevirus ratti include:

1. Animal contact: Rocahepevirus ratti can be found in animals (rodents and cattle, etc.), and contact with animals may increase the risk of infection.

2. Immunosuppressive people: Rocahepevirus ratti infection may be more serious in people with weakened immune systems. In particular, organ transplant patients, people with human immunodeficiency virus infection, and patients receiving chemotherapy or immunosuppressive drugs are at higher risk to developing a chronic Rocahepevirus ratti.

3. Blood or blood product transfusion: Patients who are transfused with blood or blood products might be at risk for Rocahepevirus ratti infection.

Given these risk factors, appropriate laboratory testing should be performed in persons with suspected Rocahepevirus ratti infection. People with symptoms, transfusions of blood or blood products, those with compromised immune systems, people with animal contact, or those who consume contaminated food are at risk and are advised to get tested in consultation with their doctor.

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