

Diagnosis of Viral Hepatitis E in the Republic of Belarus

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Hepatitis E virus (HEV) is the agent of acute and, in some cases, chronic hepatitis, a widespread inflammatory liver disease in humans. Orthoherpevirus A belongs to the Herpeviridae family and includes strains circulating among humans, deer, wild boars, rabbits, domestic pigs and other animal species. There are 8 genotypes of HEV. Most often the 1 - 4 genotypes are found. The genotypes 1 and 2 of HEV causes disease in humans only and is most common in developing countries. Genotypes 3 and 4 can infect both humans and animals.

Cases of hepatitis E in European countries have previously been associated with traveling abroad. In recent years, the infection is associated with genotype 3 and is an endemic disease, since most of the reported cases are autochthonous and are associated with eating raw or insufficiently thermally processed contaminated meat of pigs, wild boars or deer.

The purpose of the study is to determine the optimal algorithm for the diagnosis of HEV infection and identification of strains of HEV that circulate in the Republic of Belarus (RB).

The research material was samples of blood serum, urine and feces of conditionally healthy citizens of the Republic of Belarus, foreign citizens temporarily staying in the Republic of Belarus, people from risk groups and patients with acute and chronic hepatitis. For diagnosis, the ELISA was used to detect antibodies - anti-HEV IgM and IgG, HEV antigens and PCR of HEV RNA. Phylogenetic analysis of RNA sequences was performed.

The incidence of anti-HEV IgG among of conditionally healthy residents of the Republic of Belarus was on average 8.4% (95% CI, 5.87 - 11.37), blood donors with elevated enzyme levels - 11.8% (95% CI 6.88 - 18.90), pregnant women - 6.6% (95% CI 3.70 - 10.90), foreign citizens temporarily residing in the Republic of Belarus - 5.2% (95% CI 4.11 - 6.53), 6.3% among patients with acute hepatitis (95% CI 2.74 - 12.51), chronic hepatitis - 15.3% (95% CI 10.28 - 22.04), after orthotopic liver transplantation - 9.1% (95% CI 1.87 - 26.57). The 15 patients with icteric forms of acute hepatitis E were identified, including 2 pregnant women, HIV-infected patients, as well as liver recipients.

The prevalence of anti-HEV among domestic pigs from 90 households was 33.8% (95% CI 30.44 - 37.32). In 26.0% of swine feces samples (95% CI 18.87 - 40.11), HEV RNA was detected. All HEV isolates were genotype 3.

The study showed that all cases of human hepatitis E in RB are caused by 3f and 3c genotypes of HEV. The possibility of importing HEV from outside the Republic of Belarus and the existence of autochthonous cases of the disease have been reliably established. Most cases of autochthonous hepatitis are associated with eating thermally untreated liver and meat of domestic pigs.

Acute HEV does not differ clinically from other viral hepatitis; for routine diagnosis, ELISA is important for determining the clearance of IgM and IgG. HEV RNA PCR was positive only in 5 blood samples and 7 fecal samples in the first week of the icteric period. ELISA may be a promising method for detecting HEV antigens in urine.

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