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Diagnostics of HCV infection is one of the significant problems of modern medicine. The main target of the hepatitis C virus (HCV) is hepatocytes. Hepatitis C, as a rule, is asymptomatic and remains occult. HCV is of the greatest variability among all pathogens of viral hepatitis. At present, there are 6 main genotypes of the virus. Due to high mutational activity, HCV is able to avoid the effects of the protective mechanisms of the immune system. The dynamics of a special HCV marker (total HCV antibodies, as well as specific antibodies IgG and IgM) at different stages of the infectious process is different. In the blood, HCV is detected only in the acute phase of infection. To accurately analyze the dynamics of the process of HCV infection, comprehensive diagnostics is needed using modern methods.

*Keywords:* HCV, EIA, Ab, PCR.

The causative agent of HCV is the RNA genomic virus included in the genus *Flaviviridae*. Virions of a spherical shape are surrounded by a super-capsid. The HCV genome encodes structural proteins – C, E1, E2 / NS1 and non-structural proteins – NS2, NS3, NS4, NS5. The variability of protein ratios determines the presence of multiple serotypes. To each of these proteins, antibodies circulating in the blood are produced, which do not have virus neutralizing properties. The essential condition for the HCV infection development is the virus penetration into hepatocytes, where it replicates. Direct cytopathic effect of the virus on hepatocytes is observed only with the primary infection. The main lesions of organs and tissues in HCV are caused by immunological reactions. There is no rapid elimination of the pathogen from the hepatocytes. This is due to its weak immunogenicity. The main mechanism for "escaping" the virus from under the immune control is the high variability of the pathogen. The resulting specific anti-bodies directed at the dominant genotype lead to the destruction of the variant of the virus. But its place is occupied by one of the many minor quasispecies, immunity turns out to be inconsistent. As a result, hypervariable strains are maintained and support active replication. The rate of mutations exceeds the rate of replication, which forms the inherent HCV perennial persistence of infection.

In the laboratory diagnostics of hepatitis C, the main role belongs to serological methods based on the detection the general and specific antibodies to HCV (anti-HCV antibodies) in the blood serum and molecular biological methods based on the detection the RNA of the virus. Serological methods include ELISA. With the help of ELISA, IgM and IgG to HCV are detected in serum and plasma. The specificity of modern test systems for ELISA anti-HCV antibodies exceeds 99 %. The very fact of the presence of antibodies shows not only that a person is infected with hepatitis C, but also allows clarifying whether it is the consequences of an earlier infection, a chronic form of the disease or its acute course. At the same time during the development of the disease there is a so-called "seronegative window" – that is, antibodies appear in the blood of a sick person not earlier than 2–3 weeks after the onset of infection. Negative results of ELISA test are more likely to exclude hepatitis C. Among the sera, there are samples containing anti-HCV in amounts that are close to the norm of the detecting limits, which may be due to the early stage of infection. In case of the detection of anti-HCV IgM and IgG, additional polymerase chain reaction (PCR) testing is needed to detect HCV RNA. Qualitative detection of RNA indicates the presence of the virus, and quantification in real time gives an idea of the viral load. It is also necessary to carry out genotyping of the virus for the detection of genotypes of HCV by PCR.

Thus, to obtain complete information about the presence of HCV in the human body and the dynamics of the disease development, a comprehensive examination of the patient, including both serological (ELISA for the determination of total HCV antibodies as well as specific IgM and IgG), and a molecular biological study (PCR for HCV detection and the definition of its genotype) is required.

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