

The Significance of Gene Polymorphism in the Diagnosis of Viral Hepatitis B and C

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Abstract: The obtained results serve as a basis for a more extensive study of the contribution of genetic factors in the course of chronic viral hepatitis V and C, and for the personalization of approaches to the treatment of patients. Based on the obtained data, the quality of diagnosis will be improved and the criteria will be developed to reduce the serious complications of the disease, liver cirrhosis and carcinoma, disability and death rate. Scientific studies, the analysis of the studied literature show that in the development of chronic viral hepatitis, it is necessary to carry out genetic tests in making an accurate diagnosis of the course of the disease.

Keywords: genetic polymorphism, chronic viral hepatitis, cytokines, hepatocellular carcinoma.

The urgency of the problem. Viral hepatitis C and B continue to be the most important medical and social problem throughout the world. This is due to high morbidity, especially among young people, the severity of complications and the degree of chronicity. Hepatitis C and B viruses are the most common causes of hepatocellular carcinoma. Chronic viral hepatitis C is one of the socially significant infectious diseases. The importance of this disease is determined by the high proportion of chronicity of acute hepatitis (up to 80% of cases), the ability of the hepatitis C virus to permanent mutations and the difficulties associated with this in creating a vaccine, expensive treatment [5,7,11]. In 2019, according to World Health Organization (WHO) 71 million people worldwide are infected with the hepatitis C virus, and 350,000 to 500,000 deaths annually. Chronic viral hepatitis C is considered one of the leading causes of liver cirrhosis and the development of hepatocellular carcinoma. It is the clinical outcomes of hepatitis C that more often than other etiological factors lead to liver transplantation [7,12].

According to various authors, 250-400 million people are registered in the world chronically infected with the hepatitis B virus. The urgency of the problem is also associated with the possible consequences of chronic viral hepatitis. It has now been proven that chronic HCV infection leads to progressive inflammation of the liver; in 20-30%, progression of liver cirrhosis is observed, followed by decompensation or the formation of hepatocellular carcinoma [3]. It has been established that in patients with hepatitis B in 70-90% of cases, the development of hepatocellular carcinoma is possible at stages up to development of liver cirrhosis [2]. It has been shown that patients with coinfection (hepatitis B + C) have a significant increase in the risk of developing hepatocellular carcinoma [3].

The study of the mechanisms of the pathogenesis of chronic viral liver diseases against the background of the growth of this pathology in the world is an urgent task of hepatology. At the core liver damage in HCV infection is a combination of direct cytopathic and immune-mediated cellular damage induced by the virus [1].

It is believed that a violation of the structure of the liver with the development of necrotic and fibrotic changes in it is associated with the level of production of pro-inflammatory cytokines - interleukin'6 and tumor necrosis factor alpha (TNF'α) [4].

It is known that TNF'α is involved in the processes of destruction and repair of tissues against the background of inflammation, and its elevated level is observed in viral and bacterial infections,

oncological diseases, and many inflammatory reactions. During the period of exacerbation of diseases of the gastrointestinal tract, the concentration of TNF α in serum exceeds the norm by an average of 10 times, and in some patients by 75–80 times [2,8]. The current treatment strategy is based on genotype and virological response during treatment. Recently, many studies have been devoted to determining the cytokine status in CHC. Thus, according to the authors [10], elevated serum levels of pro-inflammatory cytokines correspond to a high degree of inflammation and fibrotic changes in the liver tissue.

It is known that the hepatitis C virus is characterized by a pronounced genetic polymorphism. It has been found that with HCV – infection virus is represented by a set of closely related genetic variants (quasi-variants). The genetic polymorphism of the hepatitis C virus in combination with single nucleotide polymorphism of genes obviously affects not only the course, the outcomes of CHC and CHB, but also the different rate of formation of liver fibrosis [9,11]. As noted by V.T. Ivashkin, chronic damage to hepatocytes by the hepatitis B virus is a potentially precancerous process as a result of an imbalance between hepatocyte regeneration and inflammation [3,6].

The results of research conducted in the last ten years show that the important contribution of genetic factors in the progressive development of chronic hepatitis V and C has been revealed. At the same time, the characteristics of the course of the disease and the effectiveness of the treatment depend on the genetic characteristics of the patients. Today, a number of scientific researches are being conducted in the world to study the genetic basis of chronic viral hepatitis, to prevent complications by developing early diagnosis and treatment methods. Scientific studies and the analysis of the studied literature show that in the development of chronic viral hepatitis, it is necessary to carry out genetic tests in order to make an accurate diagnosis of the course of the disease. Conducting research aimed at determining the origin and genetic relationship of dangerous complications of chronic viral hepatitis V and C (cirrhosis of the liver, hepatocellular carcinoma) is one of the urgent problems of hepatology.

CONCLUSION. The obtained results serve as a basis for a more extensive study of the contribution of genetic factors in the course of chronic viral hepatitis V and C, and for the personalization of approaches to the treatment of patients. Based on the obtained data, the quality of diagnosis will be improved and the criteria will be developed to reduce the serious complications of the disease, liver cirrhosis and carcinoma, disability and death rate. Scientific studies, the analysis of the studied literature show that in the development of chronic viral hepatitis, it is necessary to carry out genetic tests in making an accurate diagnosis of the course of the disease.

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