

Biochemically e and molecular genotypic features of HBeAg positive and HBeAg negative chronic hepatitis B in children.

A. N. Aripov¹, D. I. Mukhamedjanova², V.Sh.Rakhimova²,

¹ *Republican Specialized Scientific and Practical Medical Center of Pediatrics, Ministry of Health of the Republic of Uzbekistan, Tashkent*

² *Applicant for the Department of Clinical Laboratory Diagnostics of the Center for the Development of Professional Qualifications of Medical Workers of the Ministry of Health of the Republic of Uzbekistan, Tashkent*

Abstract

Qualitative and quantitative monitoring of infectious agents that pose a danger to the life of patients is a necessary component of the set of measures. Currently, the main methods for detecting serological markers of viral hepatitis diseases are enzyme-linked immunosorbent assay (ELISA) and polymerase chain reaction (PCR). Monitoring the viral load will not only allow you to effectively fight the infection, but can also play the role of a kind of marker of the adequacy of the therapy used, and also serve as the basis for individual correction of the patient management regimen.

Chronic liver diseases associated with hepatitis B viruses represent one of the urgent problems of modern medicine. An accurate estimate of the number of people infected with hepatotropic viruses is difficult due to various circumstances. According to WHO experts, the hepatitis B virus infects at least 240-500 million inhabitants of the planet. The formation of chronic viral hepatitis itself is an unfavorable outcome of acute hepatitis caused by a pathological reaction of the immune system, it is not possible to eliminate the pathogen that caused acute viral hepatitis.

Key words: viral hepatitis, HBeAg, HBsAg, viral load

Research methods: The levels of ALT, AST, total bilirubin (TB), direct bilirubin (DB), total protein and its fractions, ALP, GGT were determined. All sera were obtained prior to treatment. Etiological diagnosis verification performed detection in blood serum DNA HBV

(method of polymerase chain reaction - PCR), HBV serologic markers (HBeAg , HBsAg) by ELISA .

Purpose of the study: The purpose of this study is to study the biochemical and molecular- genotypic characteristics of HBeAg positive and HBeAg negative chronic hepatitis in children.

Among the examined children with CHB, the incidence of HBsAg- negative forms of HBV infection (group 1) is 54.5% (24 patients). In 45, 5% (20) of sick children, HBsAg was not detected (group 2). Test systems based only on monoclonal antibodies did not detect HBsAg at a concentration of 5 ng / ml and below.

As our studies have shown , in 30% of children with chronic viral hepatitis B against the background of a positive HBsAg result (by ELISA), moderate - $10^{6.16 \pm 0.72}$ copies / ml and high - $10^{8.15 \pm 0.56}$ copies / ml viral load.

In 20 % of children with HBsAg- negative forms of HBV infection, the viral load, determined by PCR, ranged from $10^{4.02 \pm 0.30}$ to $10^{6.8 \pm 0.46}$ copies / ml, which indicates a moderate degree of viremia . In 8 (40%) sick children with HBsAg- negative forms of HBV infection, the viral load was less than $10^{2.58 \pm 0.10}$ copies / ml, which indicates a very low replicative activity of the virus.

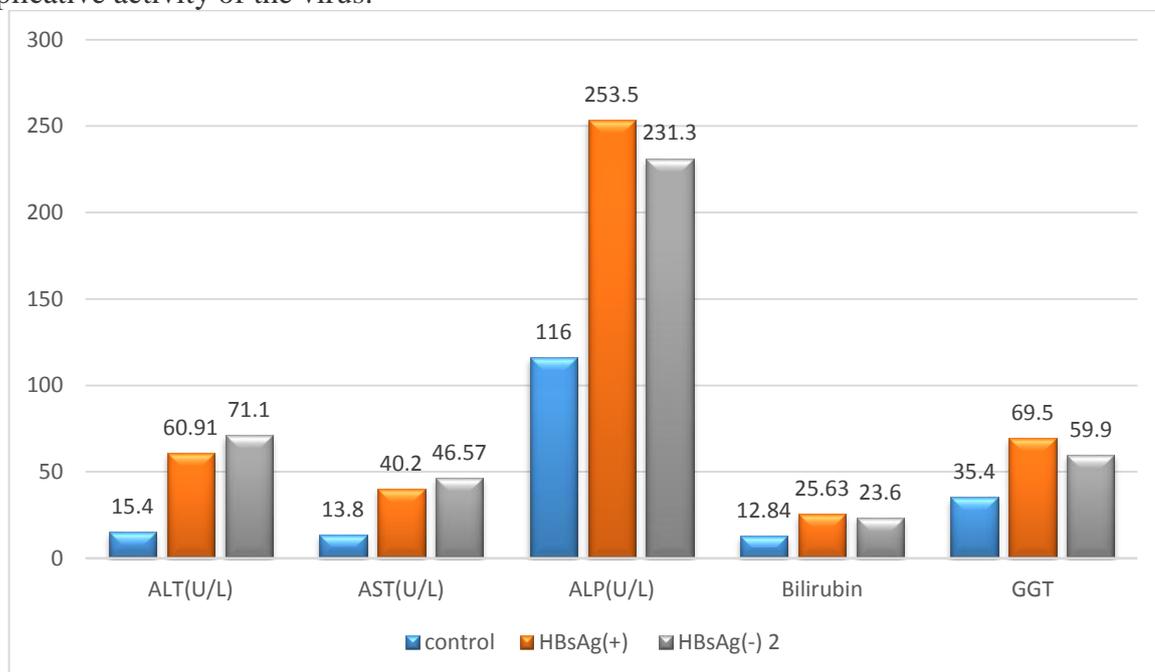


Fig. 1. Comparison of the results of clinical and laboratory studies of patients with HB s Ag - positive and HB s Ag - negative CHB

The lack of basic serum markers of viruses of hepatitis B in the body - HBs antigen, in the presence of HBV DNA, can be explained by the presence of children « HBs -negative" mutated forms of hepatitis B. Since we have excluded the possibility of false-negative results due to the lack of analytical sensitivity of the ELISA test systems.

In HBsAg (-) CHB, ALT and AST levels depended to a greater extent on the parameters of parenchymal damage, which proved the cytopathic effect of pres / s-mutant HBV.

In HBsAg (+) hCG B levels of ALT, AST, alkaline phosphatase did not depend on indicators of parenchymal damage, but depended on inflammation and fibrosis.

The number of bonds in CHC was less than in CHB, especially in its HBsAg (+) form. In CHC, there was no association of ALT with inflammatory infiltration. All this indicated that the immune system does not have time, due to frequent mutations of HCV, to develop a strong specific response to it, in contrast to HBV, in which HBsAg is synthesized in a high concentration and for a long time until the pres / s mutation occurs. These results indicated an immune-mediated effect of the virus.

With HBsAg (-) CHB contrast, levels of ALT and AST and dependent largely on the performance of parenchymal damage, it has proved cytopathic effect pres / s-mutant HBV.

In HB s Ag - negative patients, the level of viremia was significantly lower - 1256 ± 121 copies / ml, which indicates a low replicative activity of the virus.

In HB s Ag- negative patients, the viremia level was significantly lower - 1256 ± 121 copies / ml, which indicates low replicative activity. Low viral load in latent CHB is accompanied by cytolytic syndrome.

In patients with chronic hepatitis C included in the study, who underwent a qualitative and quantitative assessment of the level of viremia, in $58.82 \pm 9.30\%$ of cases, viremia met the criteria for high viral load, accompanied only in 41, 18 % by signs of minimal and moderate biochemical activity.

This fact can be explained by the peculiarities of the replication of the pres / s- mutant form of HBV, leading to an increase in hepatocellular failure due to the inability to leave the cell for defective viruses, devoid of envelopes, and leading to an aggravation of the course of the disease. In fig. 4 shows the indices of the content of DNA-HB V in children with HBeAg-negative and HBeAg-positive CHB variants. At HB s Ag -negative

patients, the level of sup emii was much lower - 1106 ± 121 copies / ml, which indicates a low replicative activity of the virus.

Thus, laboratory parameters of HBeAg- negative CHB were more pronounced compared to HBeAg- positive CHB. The clinical course of HBeAg- negative hepatitis depended on the HBsAg- phenotype of the virus: HBsAg- negative CHB was characterized by higher clinical and laboratory activity, despite the absence of viremia, in contrast to HBsAg- positive CHB, accompanied by viremia.

References

- [1] Bekku, D. Long-term follow-up of patients with hepatitis B e antigen negative chronic hepatitis B / D. Bekku [et al.] // J. Gastroenterol. Hepatol. – 2011. – V. 26. – P. 122–128.
- [2] Douam F., Ploss A. Proteomic approaches to analyzing hepatitis C virus biology. *Proteomics*. 2015; 15 (12): 2051–2065.
- [3] E.A. Elpaeva The role of mutant forms of hepatitis B virus in the progressive course of chronic hepatitis B / E.A. Elpayeva [et al.] // Scientific Notes of Petrozavodsk State University. - 2014. - No. 6. - S. 41-46.
- [4] Nikolaev E.N. Mass spectrometry in proteomics. Application of mass spectrometers with high accuracy of mass measurement in studies of molecular polymorphism of proteomes / E.N. Nikolaev // In the book: Human molecular polymorphism. Moscow: Peoples' Friendship University of Russia. - 2007. -- S. 1 - 8.
- [5] Raimondo G. Clinical virology of hepatitis B virus infection.// *Hepatology*, EALS, 2003, vol. 39, p. 26-30.