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Methods of Studying the Prognostic Significance of Changes in Peripheral Blood Analysis Observed in Chronic Viral Hepatitis B

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Abstract: This article presents hematological changes that can be observed in chronic viral hepatitis and chronic liver diseases. Changes in peripheral blood analysis indicators were analyzed using the results of several scientific studies conducted by scientists. The importance of early diagnosis of diseases and complications is also shown.

Key words: chronic viral hepatitis, thrombocytopenia, leukopenia, neutropenia, liver cirrhosis, hepatocyte, leukocytosis.

In recent years, there has been an increase in the number of patients with chronic diffuse liver disease (CHD) in many countries of the world, especially among people of working age. CKD is characterized by a severe course, leading to serious complications and is one of the main causes of disability in patients in developed countries. According to WHO, cirrhosis of the liver is the eighth leading cause of death. Therefore, studying the epidemiology, clinical symptoms, diagnosis and treatment methods of these diseases is one of the urgent problems of modern hepatology. [1,7].

According to the WHO, in 2019, 296 million people were infected with chronic viral hepatitis B, and 1.5 million new cases are diagnosed each year, of which approximately 820,000 people die, mainly due to cirrhosis and hepatocellular carcinoma (primary liver cancer). leads to death [2]. Hepatitis viruses are pantropic viruses that can affect the hematopoietic system at different stages of the disease. [3,8].

It is known that various hematological disorders occur in liver diseases. 314 adults with acute viral hepatitis were studied to understand hematological changes in acute viral hepatitis. 3 of them have acute hepatitis A, 81 have acute hepatitis B, 99 have acute hepatitis not related to A and B viruses, and 181 have acute hepatitis on the background of chronic hepatitis B. 223 men and 91 women participated in the study; age ranged from 16 to 74 years (average age 39 years). The results showed that thrombocytopenia (platelet count less than 120,000/m3), anemia (Hb level less than 12% in men and less than 10% in women), leukocytosis (leukocyte count more than 10,000/m3) and leukopenia (leukocyte count less than 4000/m3) were 18.3%, 11.6%, 10.8% and 7.4%, respectively. In hypertensive patients treated with chronic hepatitis B, the incidence of anemia and thrombocytopenia was significantly higher than in patients with acute hepatitis B. Patients with anemia, thrombocytopenia, or leukocytosis had significantly higher mean serum bilirubin and prolonged prothrombin time, suggesting that hematologic changes are closely related to the degree of hepatocyte injury. In addition, 3 cases (0.9%) complicated by aplastic anemia were noted during follow-up. Of these 3 cases, 2 died of complications related to aplastic anemia and 1 survived due to normalization of hematological parameters after treatment [4]. By analyzing the results of this research work, it can be understood that normalization of hematological changes is important in preventing complications in liver diseases.

Hepatitis B virus infection is a serious medical problem that can lead to cirrhosis with a high risk of death. Patients with liver cirrhosis can be divided into compensated and decompensated diseases. Mortality increases dramatically as patients progress to decompensated cirrhosis. Currently, the only effective therapy for patients with decompensated liver cirrhosis due to chronic hepatitis B is liver transplantation. However, liver transplantation is limited by a shortage of available donors, the risk of surgical complications, and high costs. Thus, the identification of objective and accurate diagnostic systems for the prognosis of decompensated liver cirrhosis in patients with chronic hepatitis B remains an urgent problem to help identify high-risk patients and change treatment strategies in clinical practice [5].

Pakistan's scientists have investigated the issue of whether various peripheral hematological indicators help to diagnose people with hepatitis B or not. In this study, it was determined that there are significant changes in the amount of hemoglobin, the number of leukocytes, the size of erythrocytes, and the level of saturation of erythrocytes with hemoglobin in normal and hepatitis B patients. It was studied that there is a slight difference in thrombocytes, monocytes and eosinophils, and there is no difference in erythrocytes, lymphocytes and neutrophils. According to the results of this study, although promising biomarkers for the diagnosis of hepatitis B virus have been shown, it is mentioned that additional large investigations are required to be more accurate [3].

Anemia is one of the main symptoms of liver damage and usually characterizes the chronic course of the process. In chronic liver diseases, a decrease in the amount of hemoglobin is observed in about half of patients. Depending on the etiology of the underlying disease, the incidence of anemia can range from 20 to 70%. Pathogenetic factors of anemia associated with liver damage are various and may include viral infection and myelosuppressive effect of alcohol, iron, vitamin B12 and folic acid deficiency, chronic blood loss. The myelosuppressive effect of chronic hepatitis B and C viruses has been proven in several studies and it has been mentioned that it does not depend on the stage of the disease. When this effect is strong, aplastic anemia can also occur. It has been shown that the origin of anemia in chronic viral hepatitis B depends on the effect of the virus. Also, cases of aplastic anemia associated with acute viral hepatitis were found in 2-5% of cases in Europe and 4-10% in the East. Profound pancytopenia can be observed both in the period of jaundice and in the period of early recovery with normal biochemical indicators [9].

According to the results of a study conducted to study the electrical conductivity of erythrocytes in chronic viral hepatitis B, a significant change in the elasticity and electrical conductivity properties of erythrocytes was determined as a result of systemic effects of chronic viral hepatitis B [11].

In physiological and pathological conditions, there is a close relationship between the liver and leukocytes. With viral hepatitis B, leukocyte metabolism changes. The metabolic state of leukocytes in the peripheral blood can reflect the level of metabolic disorders in the human body. Morphofunctional changes of enzymes in peripheral blood neutrophils during viral hepatitis in children were studied. Cytochemical tests reflecting the course of chronic viral hepatitis B can be used to evaluate the effectiveness of therapy and the prognosis of the disease. In chronic viral hepatitis B, clear changes in the metabolism of peripheral blood neutrophils have been revealed. The normalization of neutrophil metabolic indicators in this disease was noted only in the 5-6th or decade of the disease and was mainly observed in mild forms of the disease. Changes in the metabolism of neutrophils are associated with the infectious-toxic effect of the pathogen on cell membranes and organelles. Tests that detect dehydrogenases in liver pathology reflect the state of an important metabolic process associated with the protective-bactericidal functions of neutrophils. They can serve as an additional criterion for evaluating the severity of the disease, the course and the effectiveness of therapy [6].

Also, the effect of hepatitis C virus on the hematological system has been studied by several scientists. The effects of chronic hepatitis C on the hematological system are many. The virus can cause platelet dysfunction and thrombocytopenia [9]. As a result of such mechanisms of action of hepatitis viruses, severe

complications occur in patients. This means that the development of early diagnosis of complications is an urgent problem for the medical field and our society.

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