

## Comparative Analysis of Laboratory Parameters in Liver Cirrhosis

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**Abstract:** There are quite a lot of studies in the literature on cirrhosis of the liver. But at the same time, there are practically no comparative data on clinical and laboratory parameters depending on the etiological cause of cirrhosis.

This paper presents international experience in the field of liver cirrhosis research, as well as research data on the clinical and biochemical features of liver cirrhosis.

**Keywords:** liver cirrhosis; biochemical parameters; laboratory diagnostics.

### INTRODUCTION

Cirrhosis has become a major public health problem and a significant cause of morbidity and mortality. Cirrhosis ranks 13th among the most common causes of death worldwide. Non-alcoholic fatty liver disease (NAFLD) is clinically defined as liver steatosis in the absence of excessive alcohol consumption or other known chronic liver diseases, resulting in the final stage manifested by cirrhosis or liver cancer.

Most patients with cirrhosis of the liver as a result of NAFLD: women, over 50 years old and often obese or type II diabetes mellitus. The incidence of ascites and hepatorenal syndrome in patients with cirrhosis of the liver as a result of NAFLD is similar to that in patients with cirrhosis of the liver in the outcome of HCV.

In patients with HCG and CP, an increase in activity is recorded ALT, AST in blood serum. The highest value of the AST/ALT ratio was noted at the CPU due to the predominant increase in AST activity. Activity ALT at CPU is less than at CG. Thus, the development of the CPU it is accompanied, in comparison with HCG, by an increase in activity AST, an increase in the AST/ALT ratio and a decrease in ALT activity.

In the work of S. D. Kuznetsov, the ALT level was recorded within normal values in 48.9% of cases, up to 3 norms - 35.6% and only 15.5% above 3 norms. Thus, normal and moderately elevated ALT levels were recorded in most patients with HCV.

Fazylov V.Kh. with co-authors, during a dynamic study of activity, normal values were constantly noted — not exceeding 1.5 norm only in 3.7% of patients with HCV. 23.9% had permanently elevated ALT levels (from 1.5 to 12 norms). Most of the patients (72.4%) had undulating enzyme activity — from normal values and above 1.5 norm. According to the works of Bondarenko A.L. and Baramzina S.V., in patients with cirrhosis of the liver, symptoms of hepatic cell insufficiency and cholestasis were significantly more often detected in the outcome of HCV compared with HCV. In patients with CP, there was a greater decrease in albumins, an increase in globulins, and an acceleration of ESR.

In her work, Voznesenskaya E. A. notes that the value of the de Ritis coefficient significantly and significantly increases in patients with CP ( $P < 0.05$ ), due to a predominant increase in the activity of AST. Concomitant infection with hepatitis B and C viruses did not affect the clinical picture of alcoholic CP, however, led to higher levels of serum transaminase activity.

Thus, there are quite a lot of studies in the literature on cirrhosis of the liver in the outcome of alcoholic liver disease, less work on cirrhosis in the outcome of viral lesions, liver lesions of mixed genesis and due to non-alcoholic fatty liver disease.

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But at the same time, there are practically no comparative data of clinical and laboratory parameters depending on the etiological cause of cirrhosis.

All this determines the relevance and prospects for further study of hemato-biochemical features of cirrhosis of different etiologies.

## MATERIALS AND METHODS

In the course of the study, a retrospective assessment of hemato-biochemical parameters of patients with cirrhotic liver damage who underwent inpatient treatment in the GCP for PCV GBSNP in the period from September 2017 to February 2020 was carried out by studying these case histories.

Statistical processing of the received data was carried out using IBM software SPSS Statistics 23.0 and Microsoft Office 2019.

## RESULTS

According to our data, from September 2017 to February 2020, 132 patients were treated in the conditions of GBSMP in Samarkand patients with cirrhosis, which accounted for 3.46% of the total number of patients treated in the therapeutic department. The criteria for inclusion in the study were: age older 18 years old, diagnosed with cirrhosis of the liver.

The exclusion criteria were: pregnancy, liver damage of medicinal origin, the presence of HIV infection, verified hemoblastoses. Thus, 127 patients were included in the study. Among male patients – 76, which amounted to 60.2%, women – 51, which was 39.8%.

The minimum age of patients was 29 years, the maximum age is 87 years. The average age is  $54.05 \pm 12.16$  years: men –  $51.54 \pm 11.58$  years, women –  $57.84 \pm 12.13$  years. After analyzing the medical documentation, we divided the patients into the following groups, taking into account the etiological cause of cirrhosis:

Cirrhosis of alcoholic etiology – 24.4%, cirrhosis of viral etiology – 50.4%, cryptogenic cirrhosis of the liver – 16.5%, combination of viral and alcoholic cirrhosis – 4.7%, non-alcoholic fatty liver disease - 3.9%. Average values of hematological parameters in cirrhosis of the liver of various etiologies:

### Results and discussion

In our study, the following sample characteristics were obtained: Among patients, 76 men, which was 60.2%, and 51 women, which was 39.8%.

The minimum age of patients was 29 years, the maximum – 87 years. The average age is  $54.05 \pm 12.16$  years: men –  $51.54 \pm 11.58$  years, women –  $57.84 \pm 12.13$  years. In terms of etiological causes: cirrhosis of alcoholic etiology – 24.4%, cirrhosis of viral etiology – 50.4%, cryptogenic cirrhosis of the liver – 16.5%, combination of viral and alcoholic cirrhosis – 4.7%, non-alcoholic fatty liver disease - 3.9%.

According to the literature data provided by researchers from Singapore, where 564 patients with a median follow-up of 85 months were included in the study. The average age was  $60.9 \pm 12.5$  years, and 63.8% were men. The main etiologies of liver cirrhosis were chronic hepatitis B (HCV) (63.3%), alcoholic (11.2%), cryptogenic (9%) and chronic hepatitis C (HCV) (6.9%).

Thus, the patients in our sample were younger ( $54.05 \pm 12.16$  years), while there were slightly fewer men (63.8% vs. 60.2% in our study). Similarly According to the Singapore study, the largest number of patients were with cirrhosis of the liver in the outcome of the viral lesion (50.4%), alcoholic lesion was twice as common (11.2% vs. 24.4% according to our data), cirrhosis of unclear etiology was also twice as common (9% vs. 16.5% according to our data). The combination of viral and alcoholic cirrhosis and non-alcoholic fatty liver disease accounted for 4.7% and 3.9%, respectively.



When analyzing the hemato-biochemical parameters of patients with cirrhosis of statistical significance in the indicators of the general blood test and coagulogram in there was no dependence on the etiological cause of cirrhosis.

However, when comparing the indicators of biochemical blood analysis, it was found that the level of albumin was significantly lower in cirrhosis of viral etiology, and higher in cirrhosis in the outcome of NZHBP.

The level of urea was significantly lower in cirrhosis of the liver in the outcome of NLBP, and higher in the outcome of cryptogenic cirrhosis. GFR was significantly lower in cryptogenic cirrhosis, and higher in cirrhosis in the outcome of NLBP. Also significantly significant was an increase in the level of glycemia in the biochemical analysis of blood in patients with cirrhosis liver in the outcome of NZHBP. Cholestasis syndrome (an increase in the level of total and direct billirubin) was more pronounced in alcoholic cirrhosis, and had the least severity in cirrhosis of viral etiology. In comparison with the results of the study conducted Bilalova A. R., Makashova V. V., Shipulin G. A., in our work also the decrease in the number of erythrocytes and hemoglobin did not depend on the etiological cause cirrhosis, however, the statistical significance of the influence of the cause on the decrease in platelet levels was not revealed.

In this study, the biochemical parameters are also they were evaluated taking into account the degree of cirrhosis according to the classification Child-Pugh. In class B cirrhosis, the degree of change in the main biochemical parameters, as well as their duration, was greater in patients with CP of combined etiology than in patients with CP of alcoholic etiology, which may be due to the presence of two damaging factors in the body — HCV and alcohol.

## CONCLUSION

In the analysis of biochemical parameters in patients with CP Child-Pugh Class C revealed that baseline indicators reflecting cholestasis — total bilirubin, GGTP and alkaline phosphatase were recorded significantly higher in cirrhosis alcoholic genesis, than with cirrhosis in the outcome of mixed hepatitis. The activity of cytolysis enzymes (ALT, AST) did not depend on the etiology of CP.

It follows from this that the biochemical data in our study are similar to the results of the above study. However, in this study, in comparison with ours, the average age was significantly less ( $42.0 \pm 4.3$ ,  $45.2 \pm 6.3$  years).

Thus, the hemato-biochemical parameters obtained in our work confirm the data of foreign authors. At the same time, it was found that statistically significant differences depending on the etiological causes of cirrhosis are revealed during a biochemical blood test, while no statistically significant differences were found in the general blood test and coagulogram.

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