

## COMPARATIVE ANALYSIS OF SOME LABORATORY INDICATORS OF ALCOHOLIC AND VIRAL HEPATITIS

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**Abstract:** The article provides information on the biochemical parameters of liver function in alcoholic and viral hepatitis, as well as on the markers of viral hepatitis. According to the World Health Organization, about 2 billion people worldwide consume alcohol. Therefore, it is important to distinguish alcoholic hepatitis from viral hepatitis.

**Key words:** de Ritis coefficient, alcoholic hepatitis, hepatitis B, hepatitis C.

## ALKOGOLLI VA VIRUSLI GEPATIT UCHUN BA'ZI LABORATORIYA KO'RSATKICHLARINI TAQQOSLASH TAHLILI

**Annotatsiya.** Ushbu maqolada jigar faoliyatining alkogolli va virusli gepatit kasalliklaridagi biokimyoviy ko'rsatkichlari, shuningdek virusli gepatit markerlari haqida ma'lumotlar bor. Jahon sog'liqni saqlash tashkiloti ma'lumotlariga ko'ra, dunyoda 2 milliardga yaqin odam alkogolli ichimliklar iste'mol qiladi. Shuning uchun alkogolli gepatitni virusli gepatitdan farqlash muhim ahamiyatga ega.

**Kalit so'zlar:** De Ritis koeffitsienti, alkogolli gepatit, virusli gepatit B, virusli gepatit C.

## INTRODUCTION

According to the World Health Organization, about 2 billion people in the world consume alcoholic beverages, and 76.3 million people have alcohol-related diseases. Alkagol products damage the liver in the first place. 15-20% of the population who drink alcohol get hepatitis or cirrhosis. According to WHO (2004), average alcohol consumption per person is 5.5 liters per year. For example, if alcohol consumption in Saudi Arabia is 0 liters per year, in Mongolia this figure reaches 28.0 (5). Viral liver diseases are also common among the population (1,2). Experience shows that the liver is more damaged by viral hepatitis B and C in alcoholics, chronic viral infection aggravates alcoholic liver damage. The diagnosis is established on the basis of alcohol consumption, jaundice and the absence of other causes of hepatitis. Indicators of heavy alcohol consumption, such as carbohydrate-deficient transferrin, gamma-glutamyl transpeptidase (GGT), alanine aminotransferase (ALT), and aspartate aminotransferase (AST). Although most of them have low sensitivity and specificity, the use of combined tests increases the content of information compared to the determination of single plasma enzymes. An increase in plasma AST compared to ALT has been suggested as an indicator of alcoholic liver damage. Therefore, an AST/ALT ratio (AST/ALT ratio de Rethys ratio)  $> 1.5$  is defined as the most accurate indicator of alcoholic liver damage. (3,4)

Undoubtedly, many patients who consume a large amount of alcohol and are even addicted to alcohol can have a high level of aminotransferase in the blood, and at the same time, the ratio of AST / ALT can be normal. To test our hypothesis, we studied the De Ritis coefficient and some laboratory parameters in study participants with alcoholic hepatitis and viral hepatitis B and C.

**The goal.** Comparative analysis of some laboratory indicators for alcoholic and viral hepatitis.

## MATERIALS AND METHODS.

The research was conducted at SamDTU. It was conducted in 2020. 76 citizens of Uzbekistan with chronic liver disease were sent to the immunology laboratory of the 2nd clinic of Samarkand State Medical University. Study participants completed the CAGE questionnaire. The CAGE Questionnaire is an international official tool for determining alcoholism (developed by Dr. John Ewing, founding director of the Center for the Study of Alcoholism, University of North Carolina at Chapel Hill). Responses were coded as 0 or 1, where higher scores indicated more alcohol problems. If the total score is 2 or more, then this is evidence of clinically significant alcoholism. All subjects were tested for antibodies to C and D viruses, anti-HCV, anti-HDV, HBsAg and HBeAg antigens using ELISA (IFA) tests. All participants were screened for HBV-DNA and HCV-RNA using polymerase chain reaction. In addition, general studies were conducted to determine the activity of alpha-fetoprotein (AFP) liver enzymes. 26 (34.2%) patients showed negative results for viral hepatitis and positive results in the CAGE questionnaire. Viral hepatitis B markers were found in 39 (51.3%) patients and viral hepatitis C-11 (14.4%) patients. Inclusion and exclusion criteria were used to minimize the possibility of errors. Patients with alcoholic liver injury were defined by viral infection and a positive CAGE questionnaire. Patients with viral hepatitis B or viral hepatitis C were positive for HBsAg or anti-HCV. Patients with mixed infection or liver cancer were excluded from the study. Statistical data processing was performed using a computer program (Microsoft Office Word 2007).

**Summary.** Biochemical indicators of liver function, as well as the presence of viral hepatitis markers, were studied. In patients with alcoholic hepatitis (26 people), viral hepatitis B (39 people) and viral hepatitis C (11 people), biochemical indicators of liver function, as well as the presence of viral hepatitis, alpha-fetoprotein and some indicators of the cellular composition of blood was studied. The study group consisted of 72 (94.7%) men and 4 (5.2%) women, with an average age of  $52.2 \pm 2$  years. It was found that patients with alcoholic hepatitis had higher AST and ALT levels (AST/ALT ratio 1.0) compared to patients with viral hepatitis B and viral hepatitis C (AST/ALT ratio  $<1.0$ ).

## INSPECTION RESULTS.

The majority (94.7%) of the 76 participants in the study were men (72 people), and only 4 (5.2%) women were included in the study group. The mean age of the participants was  $52 \pm 2$  years. The mean age differed between the WAD and HCV groups by 10.25 years ( $p = 0.026$ ). According to the results of the CAGE questionnaire and the study of the presence of viral hepatitis markers. All those examined were included in the following groups: patients with alcoholic hepatitis (AG), patients with viral hepatitis B (HBV) and patients with viral hepatitis C (HCV). The main characteristics of the examined groups are presented in Table 1.

**Table 1**

General characteristics of groups infected with alcoholic hepatitis (AG), viral hepatitis B (HBV), viral hepatitis C (HCV) (mean  $\pm$  SE)

| Indicators Testing groups | Indicators Testing groups |                   |                    |
|---------------------------|---------------------------|-------------------|--------------------|
|                           | AG                        | VGB               | VGC                |
| Number of observations    | n=26                      | n=39              | n=11               |
| Age (years)               | 48,48 $\pm$ 2,26          | 50,51 $\pm$ 1,69  | 58,51 $\pm$ 2,59   |
| Men / women               | 25/1                      | 37/2              | 10/1               |
| Body weight (kg)          | 67,37 $\pm$ 1,99          | 73,38 $\pm$ 1,96  | 78,47 $\pm$ 9,08   |
| Height (cm)               | 167,35 $\pm$ 1,17         | 163,62 $\pm$ 4,39 | 146,64 $\pm$ 13,98 |

Note:  $p < 0.05$  vs. HCV group.

The body weight of patients with alcoholic liver damage was lower than in the other two groups. Perhaps because of alcohol's ability to reduce nutrient absorption. There were no significant differences in the height of the patients. The results of hepatitis B and hepatitis C markers are presented in Table 2.

**Table 2**

Serological and molecular markers of hepatitis B and C virus in patients with hepatitis B virus (HBV) and hepatitis C virus (HCV) infection (mean  $\pm$  SE).

| Indicators Testing groups | Indicators Testing groups |           |
|---------------------------|---------------------------|-----------|
|                           | VGB                       | VGC       |
| Number of observations    | n = 39                    | n = 11    |
| HBsAg (+)                 | 38 (97%)                  | -         |
| HBeAg (+)                 | 10 (26%)                  | -         |
| anti-HCV (+)              | -                         | 11 (100%) |
| anti-HDV (+)              | -                         | -         |
| HBV-DNA, copies           | 29 (74,3%)                | -         |
| HCV-RNA, copies           | -                         | 11 (100%) |

As mentioned above, there were no mixed infections in the group of patients infected with viral hepatitis B and viral hepatitis C. Positive results for the presence of HBsAg were found in 97% of patients, for the presence of HBeAg in 26%. A positive result of HBV-DNA was found in 74.3% of patients in the HBV group. A positive result of HCV-RNA and the presence of antibodies to the C virus were found in all patients of the HCV group.

#### **The results of studying the cellular composition of blood**

Biochemical indicators of the functional state of the liver are presented in Table 3.

**Table 3**

Biochemical and cellular blood parameters (mean  $\pm$  SE) in patients with alcoholic hepatitis (AH), viral hepatitis B (HBV), viral hepatitis C (HCV).

| Indicators                                     | Groups under review |                        |                      |
|------------------------------------------------|---------------------|------------------------|----------------------|
|                                                | AG                  | HBV                    | HCV                  |
| Number of observations                         | 26 (100%)           | 39 (100%)              | 11 (100%)            |
| Alpha-fetoprotein (AFP), ng / ml               | 34.43 $\pm$ 17.40   | 15.56 $\pm$ 3.49       | 20.50 $\pm$ 5.92     |
| white blood cells (WBC)                        | 8050 $\pm$ 726.14 * | 5587.54 $\pm$ 294.73 * | 4537.18 $\pm$ 618.8* |
| Hemoglobin (HGB), g / l                        | 11.7 $\pm$ 0.53     | 13.34 $\pm$ 0.34       | 12.14 $\pm$ 0.60     |
| Platelets (PLT)                                | 170.19 $\pm$ 19.04  | 153.75 $\pm$ 12.84     | 150.36 $\pm$ 22.47   |
| Total protein, g / dl                          | 6.18 $\pm$ 0.40     | 6.13 $\pm$ 0.35        | 5.5 $\pm$ 0.84       |
| Albumin (Albumin), g / dl                      | 3.13 $\pm$ 0.25     | 3.17 $\pm$ 0.18        | 3.34 $\pm$ 0.37      |
| Total bilirubin (total bilirubin), mg / dl     | 2,56 $\pm$ 0,73     | 2,00 $\pm$ 0,42        | 1,31 $\pm$ 0,28      |
| Direct bilirubin, mg / dl                      | 0.95 $\pm$ 0.36     | 0.68 $\pm$ 0.18        | 0.34 $\pm$ 0.11      |
| Aspartate aminotransferase (AST), IU / L       | 76.33 $\pm$ 15.23   | 138.51 $\pm$ 29.99     | 88.64 $\pm$ 20.09    |
| Alanine aminotransferase (ALT), IU/L           | 70.63 $\pm$ 12.52   | 187.62 $\pm$ 44.67     | 91.91 $\pm$ 18.64    |
| de Ritis coefficient (AST / ALT ratio)         | 1,0 $\pm$ 1,21      | 0,73 $\pm$ 0,67        | 0,96 $\pm$ 1,07      |
| Alkaline phosphatase (Alk phosphatase), IU / L | 110.59 $\pm$ 11.17  | 115.69 $\pm$ 10.41     | 109.91 $\pm$ 21.06   |
| Gamma glutamyl transpeptidase (GGT), IU/L      | 219,56 $\pm$ 88,12  | 161,41 $\pm$ 35,26     | 161,18 $\pm$ 43,77   |
| Prothrombin time (PT prolonged)                | 1,82 $\pm$ 0,38     | 1,88 $\pm$ 0,33        | 1,88 $\pm$ 0,58      |
| International normalized                       | 1,28 $\pm$ 0,10     | 1,34 $\pm$ 0,07        | 1,26 $\pm$ 0,13      |

## CONCLUSION

Patients with alcoholic hepatitis had higher levels of AST and ALT transaminases, AST/ALT ratio, GGT activity, and total bilirubin than HBV and HCV groups ( $p < 0.05$ ). The level of albumin in blood plasma was lower in patients with AG group compared to other groups. Patients in the hypertensive group had relatively high white blood cell counts and low hemoglobin levels in the blood, compared to other groups. The level of other indicators was relatively the same.

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