Western European Journal of Medicine and Medical Science
Volume 3, Issue 02, February 2025
https://westerneuropeanstudies.com/index.php/3
ISSN (E): 2942-1918 Open Access| Peer Reviewed

IMMUNOLOGICAL ASPECTS OF SPONTANEOUS BACTERIAL PERITONITIS COMPLICATED IN VIRUS ETIOLOGY LIVER CIRRHOSIS

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✓ ***Abstract***

The article presents clinical and laboratory data of the examined patients. 120 patients were under observation. Main group I included 61 patients suffering from liver cirrhosis of viral etiology with SBP, main group II included 59 patients with liver cirrhosis. As a control, 30 practically healthy people were also examined.

In all patients with SBP (Group 1) at the stage of decompensation of liver cirrhosis of viral etiology, the level of PCT was significantly higher by 10 times, amounting to 0.88±0.04, compared with patients with uncomplicated SBP (Group 2), in which is equal to 0.08±0.02 (p=0.05). It was found that the level of CRP in the 1st group was 32.4±8.23 and increased by 3.75 times (p=0.05) compared with the 2nd group.

Key words: *liver cirrhosis, spontaneous bacterial peritonitis, procalcitonin, C-reactive protein.*

Relevance

As reported by the World Health Organization (WHO), over 325 million individuals worldwide are infected with hepatitis B or C, leading to 1.4 million fatalities per year[1-4]. Hepatitis B and C rank second in mortality after tuberculosis, with 9 times more individuals infected with hepatitis than HIV. However, over 80% of hepatitis cases lack access to adequate testing and therapy[5-9].

Despite medical advancements, chronic viral hepatitis (CVH) continues to be a pressing issue in Uzbekistan[10-12]. This disease predominantly impacts individuals of working age and frequently results in complications such as liver cirrhosis (LC) and hepatocellular carcinoma (HCC), contributing to increased medical and social expenses[13-15].

Spontaneous bacterial peritonitis (SBP) is a prevalent and serious complication of cirrhosis:

- 30% of cirrhosis patients experience bacterial infections either upon admission or during hospitalization.
- SBP represents the most frequent bacterial infection in individuals with cirrhosis.
- Patients possess impaired immune defenses, facilitating bacterial translocation.
- Timely detection is essential, though diagnosis remains challenging due to nonspecific clinical manifestations.
- Procalcitonin (PCT) and C-reactive protein (CRP) serve as prospective diagnostic biomarkers for early identification[16-19].

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Procalcitonin has been proposed in studies as a potentially valuable serum biomarker for diagnosing bacterial infections in general and SBP in particular [20-23].

CRP is a prominent biochemical marker of inflammation caused by a variety of causes, including infectious and non-infectious inflammatory diseases, and has also been shown to be involved in several immunological functions [24-27]

Thus, infections are common in patients with cirrhosis of the liver, and SBP is one of the most common, with variable frequency but significant mortality. One of the most important factors in the management of this significant consequence of decompensated liver cirrhosis is early detection. It is critical to find non-invasive, accessible, and easy-to-apply SBP-related parameters that play a predictive role[25-28]. However, it should be borne in mind that these methods cannot completely replace paracentesis; More research is needed to determine if non-invasive methods are accurate enough to detect the development of SBP in cirrhosis[28-30].

Materials and methods

Clinical observations, laboratory and instrumental examinations of patients with liver cirrhosis of viral etiology were carried out in the Bukhara Regional Infectious Diseases Hospital, at the Research Institute of Virology of the Republican Specialized Scientific and Practical Medical Center for Epidemiology, Microbiology, Infectious and Parasitic Diseases.

Main group I included 61 patients suffering from liver cirrhosis of viral etiology with SBP, main group II included 59 patients with liver cirrhosis. As a control, 30 practically healthy people were also examined.

The diagnosis of cirrhosis with viral etiology was established on the basis of the epidemiological anamnesis, medical history, clinical data and on the basis of laboratory data.

In order to establish the viral etiology of the diagnosis of cirrhosis, an analysis was made to determine the markers of infection with the HBV, HDV viruses, HCV was determined by the polymerase chain reaction (PCR).

Among them, in the 1st group, HBV- infection was observed in 15 (25%) patients, HCV infection - in 25 (41.7%), HBV + HCV- infection - in 1 (1.67%), HBV + HDV- infection - in 19 (31.7%). In the second group, HBV infection was noted in 13 (22.4%) patients, HCV infection in 27 (46.6%) patients, HBV+HCV– infection in 1 (1.72%), HBV+HDV– infection in in 17 (29.3%).

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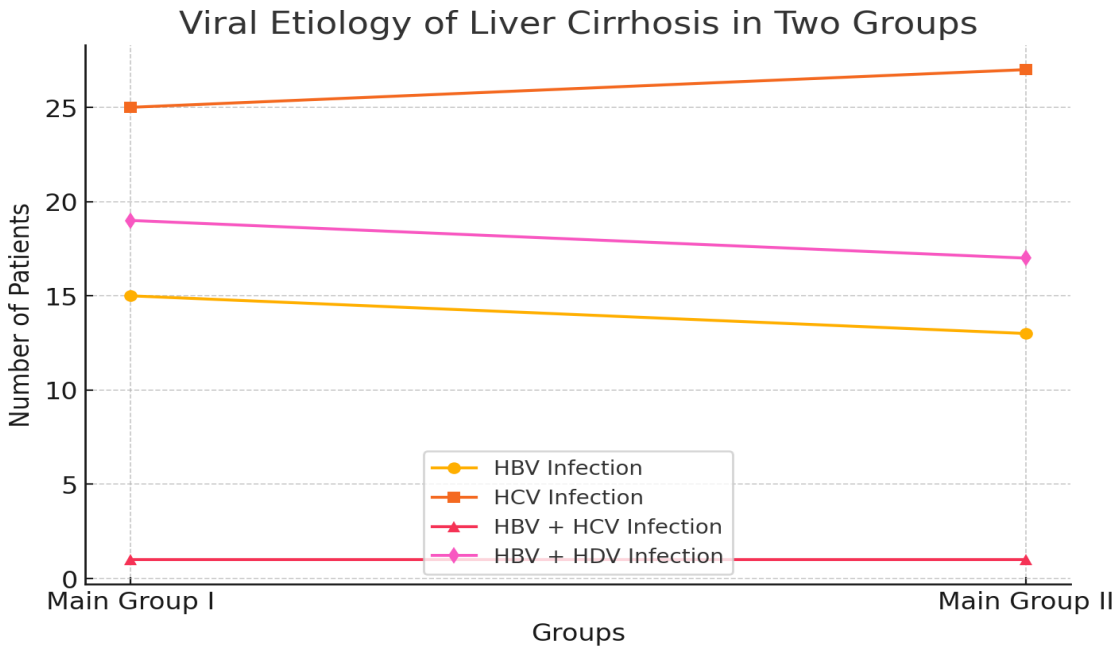

Result and discussion

The results of the study showed that in the first group of 60 patients, 38 (63.3%) were male and 22 (36.7%) female, and in the second of 58 patients, 27 (46.55%) were male and 31 (53.4%) consisted of women. It should be noted that the probability of occurrence of SBP prevailed in men.

The average age index of sick men of the 1st group was 48.4±10.1 years, and in women 43.1±14.8 years. The age indicators of patients of the 2nd group did not differ from the first and amounted to 45.5±10.1 and 52.1±13.07, respectively.

The duration of the disease in patients of both groups ranged from one month to several years, while the majority of them, 46.7% and 41.4%, respectively, indicated that liver cirrhosis was diagnosed several years ago[31-35].

An analysis of the incidence of the disease between groups showed that in group 1, cirrhosis was most often detected in 17 (28%) people aged 51-60 years, the bulk of which were 12 (20%) men and 5 (8.3%) women. Unlike the first group, in the 2nd group cirrhosis of the liver was detected in the age group of 41-50 years, mainly in 10 (17%) men and 6 (10%) women.

These data correspond to the results of foreign epidemiological studies, in particular, the results of V.T. Ivashkin, which included more than 50,000 patients from different regions of the Russian Federation (2014) [36-40].

The main clinical signs of the examined patients were general weakness in 102 (86.4%), decreased appetite in 74 (62.7%), nausea and vomiting in 51 (43.2%), pruritus in 25 (21.2%) and abdominal pain 71 (60.2%), 70 (59.3%) had subfebrile fever, 19 (16.1%) had a high temperature, 50 (42.4%) had severe jaundice, 43 (36.4%) - moderate jaundice, 71 (60.2%) - splenomegaly, 61 (51.7%) were found to have edema. These data are consistent with the results of foreign clinical trials [41-43].

When examining patients, "spider veins" were noted in 75 (63.6%), palmar erythema in 43 (36.4%), varicose veins of the esophagus in 68 (57.6%). Cases of epistaxis were observed in 47 (39.8%) patients.

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In addition, a comparative analysis was made of the duration of complaints and symptoms in patients in the comparison groups, which revealed significant differences between them. The results of a comparative analysis showed that patients of the 2nd group had more poor symptoms, in contrast to patients with SBP (1st group). The leading symptoms in patients of this group were itching (52±15.6%) and splenomegaly according to liver ultrasound, mostly asymptomatic.

The majority of patients in the second group had asthenovegetative syndrome, which was characterized by the presence of general weakness and decreased performance (84.1 ± 9.03% of the total number of the group), while in patients of the first group, these signs occurred with a frequency 89.4±8.3%. In 72.3±15.4% of patients of the second group, dyspeptic symptoms were noted, in particular, episodic occurrence of heartburn, heaviness in the epigastric region, decreased appetite and loosening of the stool. Pain in the abdomen in patients of the 2nd group was 65±14%, and in patients of the 1st group, this figure was 76±13%.

An objective examination was organized to identify signs such as jaundice of the skin and sclera of the eyes, white coating on the surface of the tongue, the presence of “caput medusae” and liver symptoms such as palmar erythema, spider veins, bleeding from the gums and nose.

In case of liver diseases, the skin acquires a yellow color of varying intensity: from dark gray to dark yellow, which in turn occurs as a result of the deposition of bilirubin and its metabolic products in the skin. Jaundice often affects the eyes and mucous membranes: instead of white, they turn yellow.

An objective examination of the patients revealed that in the 1st group during the treatment period, icterus of the skin and sclera of the eyes lasted 8.35±2.17 and 9.92±3.16 days, respectively, while the duration of these complaints in patients was 2- th group was 6.33±2.69 and 6.11±2.28, respectively, which was significantly less than the first group.

Palmar erythema or "hepatic" palms is a condition in which there is even redness of both palms. Palmar erythema appears due to circulatory disorders in the portal vein, leading to the formation of arteriovenous anastomoses. Reddening of the palms occurs when additional vascular branches are formed that connect the veins and arteries for the normal nutrition of the skin and other organs.

Signs of palmar erythema in patients of the 1st group lasted on average 1 day longer compared to the 2nd group, amounting to 9.63±2.68 and 8.93±1.98 days, respectively. The difference in spider vein symptom scores had similar results, with the duration being 9.28±0.68 and 8.13±2.16 days. Also, the appearance of spider veins in patients with cirrhosis may be associated with a violation of the estrogen conformational properties of the cytochrome system in the damaged liver.

Patients in whom cirrhosis proceeded with the development of complications in the form of the development of SBP (Group 1), in contrast to patients in whom cirrhosis of the liver proceeded without the development of complications in the form of SBP (Group 2), hypoalbuminemia was observed, the concentration of total protein in the blood in of the first group of patients was in the range of 27.2±2.3, while in patients of the second group this indicator was 31.2±4.7. This indicated a decrease in the protein-forming function in patients of both groups.

In addition, the mean values of the amount of fibrinogen in patients with SBP (Group 1) 0.73±0.14 were significantly lower by 3.83 times than in the group of patients without SBP (Group 2) 2.8±0.8 ($p<0.05$). It should be noted that the level of fibrinogen in the 2nd group

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fluctuated within the minimum values. Hypofibrinogenemia develops due to a decrease in the synthesis of fibrinogen, its increased consumption, as well as increased destruction during the activation of the fibrinolysis process.

Diagnosis of bacterial complications of cirrhosis is often difficult due to the blurred clinical picture of the disease. Sometimes infectious complications appear only as an aggravation of hepatic encephalopathy. Simple and affordable screening tests for bacterial infection in cirrhosis include C-reactive protein and procalcitonin.

Conclusions. Based on these values, it can be concluded that the level of PCT and CRP in the blood serum has been proposed as a marker for early non-invasive diagnosis in patients with cirrhosis and SBP.

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