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THE IMPORTANCE OF THE LEVEL OF PROCALCITONIN IN BLOOD SERUM FOR EARLY DIAGNOSIS OF SPONTANEOUS BACTERIAL PERITONITIS IN PATIENTS WITH DECOMPENSATED LIVER CYRROSIS OF VIRAL ETHIOLOGY

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Abstract
The aim of the investigation was to study the significance of the level of procalcitonin in the blood serum for the early diagnosis of spontaneous bacterial peritonitis in patients with decompensated cirrhosis of the liver of viral etiology. Results. 120 [64 (53.3%) men and 56 (46.7%) women] patients with cirrhosis of the liver of viral etiology at the age from 30 to 69 years were examined. Of the clinical symptoms, the most common signs of SBP were fever - 36.7%, leukocytosis with the appearance of immature forms of leukocytes - 46.7%, dyspeptic symptoms - 61.7%. In all patients with SBP (n = 60) who emerged in the phase of decompensation of viral cirrhosis, PCT levels were significantly (p = 0.001) higher than in patients of the second group, that is, in uncomplicated patients with SBP (n = 60). When analyzing an increase in the PCT level in blood serum in patients of the first group, the PCT content was observed in the range of 0.5-1.0 ng / ml in 45.0%, in the range of 1.0-2.0 ng / ml in 28.3% and in the range> 2.0 ng / ml in 26.7% of patients. In the second group of observed patients, serum PCT did not exceed 0.2 ng / ml. PCT levels in blood serum were recorded in the range of 0.05–0.1 ng / ml in 18.5% of patients, in the range of 0.1–0.25 ng / ml in 30.0% of patients and in the range 0.25– 0.5 ng / ml in 51.7% of patients.
Serum procalcitonin levels are considered a marker for the diagnosis of bacterial infections and are recommended as a marker for early non-invasive diagnosis in patients with spontaneous bacterial peritonitis of viral cirrhosis of the liver.

Keywords: Cirrhosis, spontaneous bacterial peritonitis, procalcitonin.

Introduction

One of the most frequent and serious complications in patients with decompensated cirrhosis of the liver (cerebral palsy) is a bacterial infection [1,2, 3]. The most common infections in cerebral palsy are cases of spontaneous bacterial peritonitis (SBP), which account for 40–70% of cases, followed by urinary tract infections, pneumonia and cellulitis [3, 4, 5]. Early diagnosis of

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infections can improve the prognosis of patients [6, 10, 16]. However, it is difficult to diagnose SBP at the onset of cerebral palsy with ascites, since the clinical manifestations and ascitic biochemical characteristics are often contradictory [3, 4, 14, 17]. Diagnosis of bacterial complications of cirrhosis is often difficult due to the erased clinical picture of the disease. Sometimes infectious complications are manifested only by the aggravation of hepatic encephalopathy. Simple and affordable screening tests for bacterial infection in liver cirrhosis include C-reactive protein and procalcitonin (> 0.5 ng / ml) [7]. Studies have yielded diagnostic value only for serum procalcitonin (PCT) levels or in combination with peripheral blood leukocyte and platelet count (WBC / PLT) measurements in ADDs with bacterial infections and / or SBP [8, 9, 11].

Procalcitonin has been proposed in highly cited studies as a potentially valuable serum biomarker for the diagnosis of bacterial infections in general [10,11] and SBP in particular [12, 14].

Purpose of the study: to study the significance of the level of procalcitonin in the blood serum for the early diagnosis of spontaneous bacterial peritonitis in patients with decompensated cirrhosis of the liver of viral etiology.

MATERIALS AND METHODS

Examined 120 [64 (53.3%) men and 56 (46.7%) women] patients with cirrhosis of the liver of viral etiology at the age from 50 to 69 years.

To confirm the diagnosis of liver cirrhosis, its etiology, stage of compensation and complications, the clinical picture and anamnesis of the disease were studied, a complex of clinical and laboratory tests was carried out (determination of the activity of aspartate aminotransferase (AST), alanine aminotransferase (ALT), alkaline phosphatase (ALP), gamma-glutamyl transpeptidase) (GGG) , the content of bilirubin, cholesterol, total protein, protein fractions, creatinine, urea, glucose, CRP and PCT in the blood serum. Of all these indicators, such as total protein, albumin, were determined in AF and instrumental (ultrasound, elastography) diagnostic methods. For the correspondence of the index of fibrosis and cirrhosis of the liver according to METAVIR, a classification scoring scale was used. The concentration of procalcitonin (PCT) in the blood serum was determined using a MINDRAY BA-88A analyzer (China). The upper limit of the norm was taken to be a concentration of 0.05 ng / ml.

On admission, all patients underwent diagnostic parocentesis with subsequent counting of the number of neutrophils in AF and inoculation on culture media.

RESULTS AND DISCUSSION

The results of a comprehensive examination, including clinical and biochemical studies, were analyzed in 120 patients with a preliminary diagnosis of LC complicated by ascites.

The etiologically documented diagnosis of liver cirrhosis was based on the results of detecting markers of infection with HBV viruses (HBsAg, HBc-IgM, HBeAg), HDV (HDV-IgG), HCV (anti-HCV), HBV DNA and HCV RNA was determined by polymerase chain reaction (PCR).

Among them, HBV - infection was observed in 20 (16.7%) patients, HCV infection - in 69 (57.5%), HBV + HCV– infection - in 16 (13.3%), HBV + HDV– infection - in 15 (12.5%) Fig. 1).

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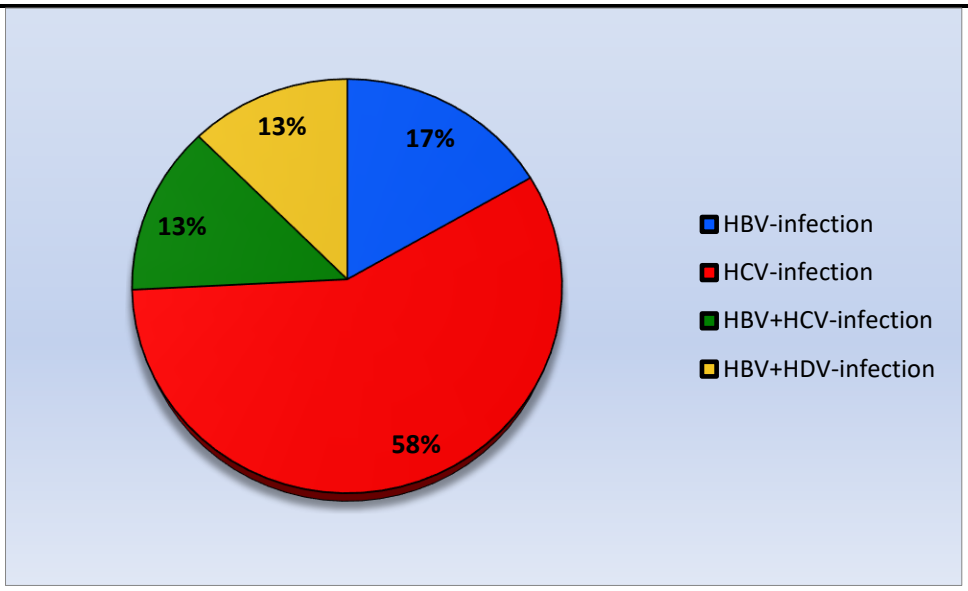

Fig. 1. Distribution of patients by nosological forms

Considering the clinical significance of determining HCV genotypes, a study of the genotypes of the virus was carried out in relation to liver cirrhosis. We examined a group of patients (85 patients) who, according to PCR data, had HCV RNA in their blood serum. After establishing the genotypes, the following results were obtained: type 1α was detected in 45 patients, 1b - in 19 patients, 3α genotype - in 16patients. Combined detection of two genotypes 1b + 3α was determined in 5 patients (Fig. 2).

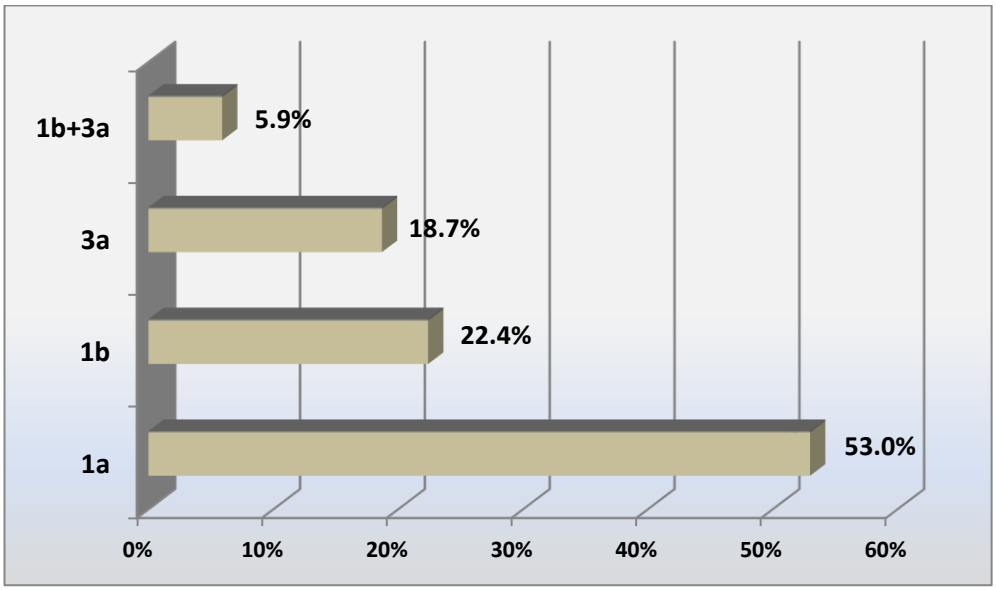

Fig. 2. Distribution of patients with HCV infection by genotype.

The average age was 58.2 ± 6.1 years for group 1, 60.3 ± 4.4 years for group 2, and 50.2 ± 7.0 years for the control group. Most of the patients were men, which is 58.3% for group 1. 63.3% for group 2, and 75% for the control group, with no statistically significant difference (p> 0.05) between all groups in terms of age and gender (Fig. 3).

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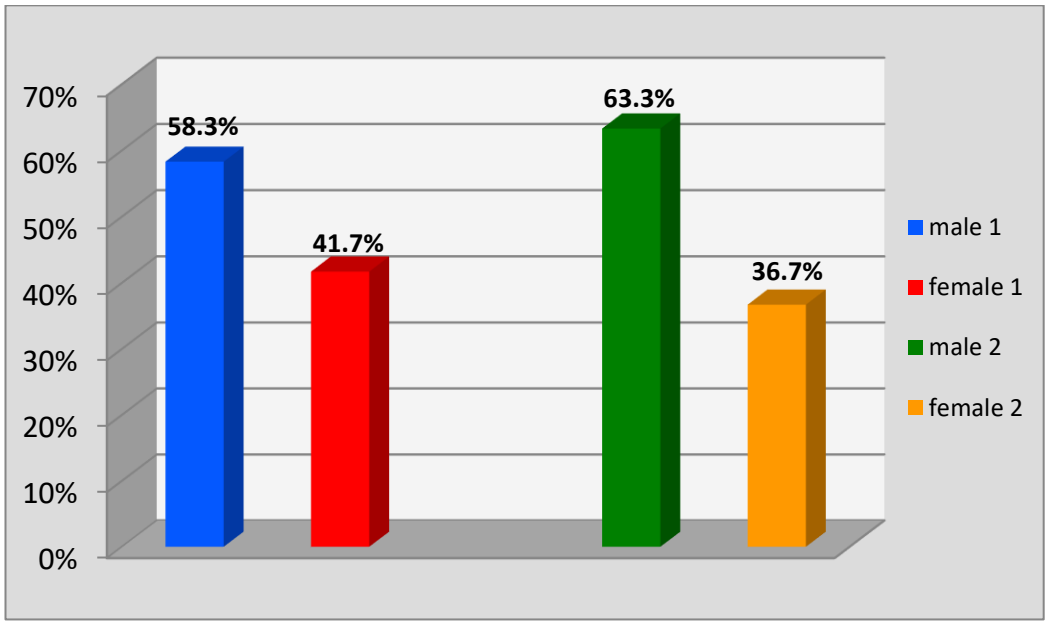

Fig. 3. Distribution of patients by age

In addition, no definitive source of infection was found other than SBP for group 1. While the analysis of acitic fluid and culture for patients in groups 1 and 2 showed that all patients in group 1 have SBP (number of PMNs> 250 cells / mm3, and all patients of group 2 have sterile ascites (number of PMNs <250 cells / mm3).

Table. Description of the results of the examined patients and healthy persons

Parameters		-1Group		Group-2		Group-3		Credibility
		abs	%	abs	%	abs	%	
Liver	Cirrhotic	60	100,0	60	100,0	0	0,0	P <0,001
	Normal	0	0,0	0	0,0	20	100,0	
Ascites	No	0	0,0	0	0,0	20	100,0	P <0,001
	Yes	60	100,0	60	100,0	0	0,0	
Ascites	No	0	0,0	0	0,0	20	100,0	P <0,001
	medium	44	73.3	16	26.7	0	0,0	
	tense	32	53.3	28	46.7	0	0,0	

The data presented in the table show that there is a high statistically significant difference between groups 1, 2 and 3 for liver cirrhosis and between groups 1 and 2 for ascites (p <0.001). As for the liver, all patients of the 1st and 2nd groups suffer from cirrhosis, and all the participants of the 3rd group are normal. As for ascites, 44 patients in group 1 have tense ascites, 16 have moderate ascites, 32 patients in group 2 have tense ascites, and 28 have moderate ascites.

The clinical picture in the examined patients was characterized by general weakness 74, decreased appetite 75, nausea and vomiting 52, pruritus 10, abdominal pain in the vast majority of patients 35. 22 patients had subfebrile fever, 3 had severe jaundice, 21 had moderate jaundice. Splenomegaly in 35 patients, edema in 30 patients. In the study of patients "spider veins" were noted in 37, palmar erythema in 21, varicose veins of the esophagus in 35. Nasal bleeding was

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recorded in 23 patients. As a result of the studies, in patients with cirrhosis of the liver of a viral nature, pronounced portal block was observed in 31 patients. Shortness of breath with a respiratory rate of up to 30-40 per minute was observed in 26 patients. In 18 patients, tachycardia was noted, the pulse was weak, it was difficult to palpate. In 5 patients, he became inhibited, answers the doctor's questions in monosyllables (Fig. 4).

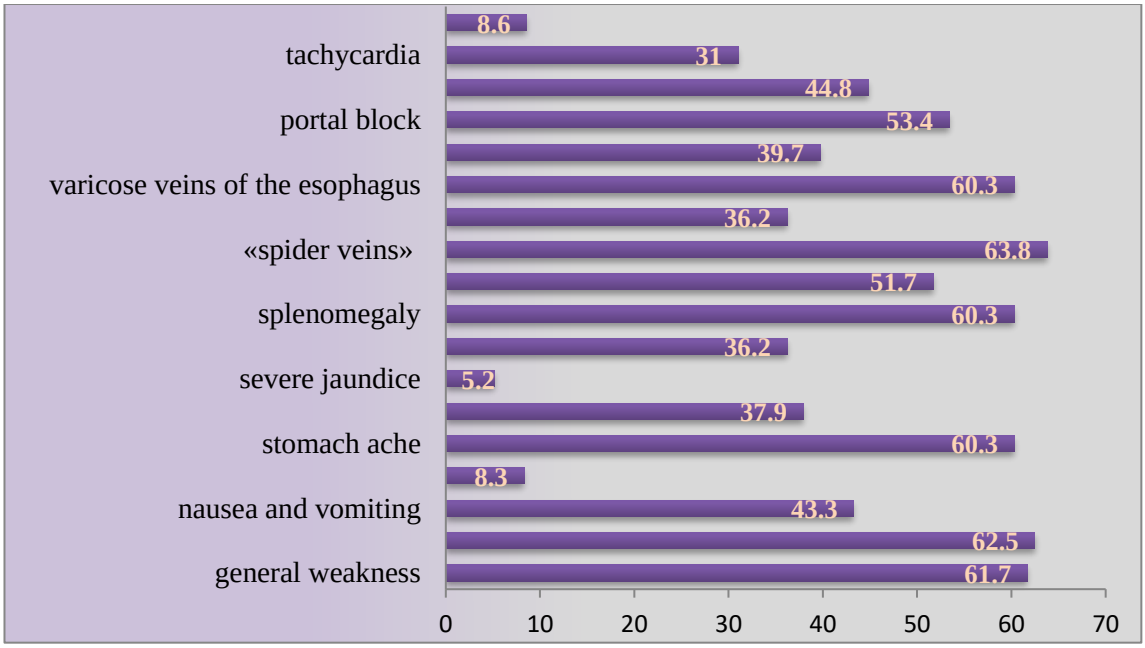

Fig. 4. The frequency of detection of symptoms in the examined patients

When processing laboratory data, anemia of varying severity was detected in 74 patients, an increase in ESR in 1/2 patients, an increase in ALT in 45, AST in 64. A moderate increase in total blood bilirubin was noted in 40 patients, a pronounced increase in total bilirubin in 13.

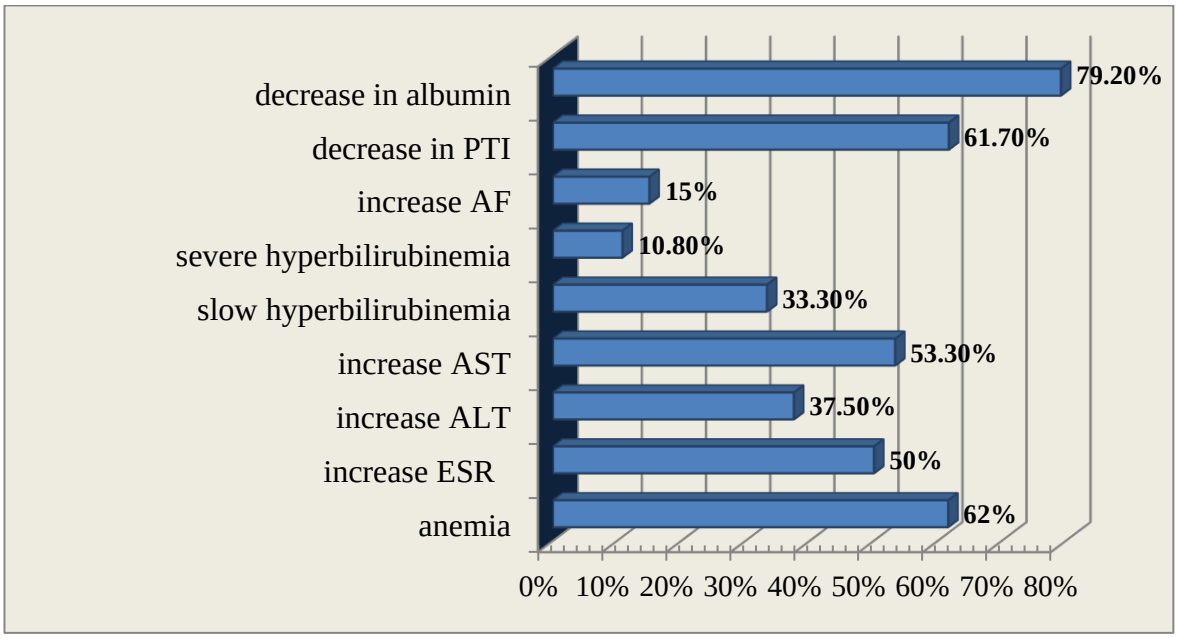

Fig. 5. The frequency of detection of laboratory parameters in the examined patients

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Increased activity of alkaline phosphatase was observed in 18 patients. Prothrombin time was decreased in 74, and albumin in 95 patients. (fig. 5).

In 62 patients, cirrhosis of the liver was combined with chronic cholecystitis, including manifestations of chronic pancreatitis in 27 patients. In 12 patients, chronic pyelonephritis was established, in 5 patients there was a combination of liver cirrhosis with gastric ulcer and duodenal ulcer.

The most common signs of SBP were fever - 38.3% (n = 23), leukocytosis with the appearance of immature forms of leukocytes - 48.3% (n = 29), dyspeptic symptoms - 61.7% (n = 37).

Based on the clinical signs of SBP, all patients with LC were divided into two groups: with n = 60 and without clinical signs, n = 60 SBP. Taking into account international recommendations, the number of PMNs per mm3 was calculated. In the group of patients with clinical manifestations of SBP (n = 60), in 57 (95%) patients, AF was neutrophilic (PMN ≥ 250 cells / mm3), while in other (n = 60) patients, PMN in AF was found in a small amount (≤ 250 cells / mm3), which made it possible to identify a subgroup of patients with aneutrophilic ascites.

By the classical microbiological method, when sowing AF on selective media, only 19 (31.7%) patients out of 60 patients were found to have sweat flora. Out of 11 (57.8%) E. coli was isolated and in 4 (21.1%) Klebsiella.

At the next stage of our study, we studied the changes in the PCT content in the serum of the observed patients. In all patients with SBP (n = 60) who emerged in the phase of decompensation of viral cirrhosis, PCT levels were significantly (p = 0.001) higher than in patients of the second group, that is, in uncomplicated patients with SBP (n = 60). When analyzing an increase in the PCT level in blood serum in patients of the first group, the PCT content was observed in the range of 0.5-1.0 ng / ml in 45.0%, in the range of 1.0-2.0 ng / ml in 28.3% and in the range> 2.0 ng / ml in 26.7% of patients. In the second group of observed patients, serum PCT did not exceed 0.2 ng / ml. PCT levels in blood serum were recorded in the range of 0.05–0.1 ng / ml in 18.5% of patients, in the range of 0.1–0.25 ng / ml in 30.0% of patients and in the range of 0.25– 0.5 ng / ml in 51.7% of patients.

CONCLUSION

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