



CLINICAL AND LABORATORY CRITERIA FOR SPONTANEOUS BACTERIAL PERITONITIS IN LIVER CIRRHOSIS OF VIRAL ETIOLOGY

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ABSTRACT: Relevance of the topic: early non-invasive diagnostics of spontaneous bacterial peritonitis (SBP) in patients with decompensated liver cirrhosis have not been developed. The aim of the investigation was to study the clinical and laboratory criteria of spontaneous bacterial peritonitis in liver cirrhosis of viral etiology.

Key words: cirrhosis, spontaneous bacterial peritonitis, procalcitonin.

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INTRODUCTION

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

The most common signs of SBP were fever - 36.7% (n = 44), leukocytosis with the appearance of immature forms of leukocytes - 46.7% (n = 56), dyspeptic symptoms - 61.7% (n = 74). Changes in the PCT content in the serum of the observed patients were studied. In all patients with SBP (n = 60) who developed 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 0.2-0.3 ng / ml in 26.7%, in the range of 0.5-2.0 ng / ml in 20% and in the range of 0.3-0.5 ng / ml in 36.7% of patients. In the second group of observed patients, serum PCT did not exceed 0.2

ng / ml. Serum PCT levels were recorded in the range of 0.1–0.2 ng / ml in 25% of patients and in the range of 0.05–0.1 ng / ml in 75% of patients.

Conclusion.

Serum procalcitonin levels are considered a marker for the diagnosis of bacterial infections and are recommended as a marker of early non-invasive diagnosis in patients with decompensated cirrhosis of viral etiology.

Spontaneous bacterial peritonitis (SBP) is the most common life-threatening infection in patients with cirrhosis and ascites. It accounts for more than half of all infections [1, 2, 3]. The prevalence of SBP on an outpatient basis is 1.5–3.5%, and in hospitalized patients it exceeds 10% [4]. Some authorities report that 30% to 60% of inpatients with LC develop a bacterial infection [3, 5], and the incidence of bacterial infections in patients with LC is 4-5 times higher than in the general population [3]. Among patients with LC accompanied by bacterial infections, spontaneous bacterial peritonitis (SBP) is the most common complication (10% to 30% of cases) and often life-threatening, with a mortality rate of 10% to 46% [6].

According to some authors, from 30% to 60% of inpatients with LC develop a bacterial infection [7], and the frequency of bacterial infections in patients with LC is 4-5 times higher than in the general population [3].

Among patients with LC accompanied by bacterial infections, spontaneous bacterial peritonitis (SBP) is the most common complication (10% to 30% of cases) and often life-threatening, with a mortality rate of 10% to 46% [6]. SBP usually presents with abdominal pain and soreness associated with fever. However, it can present with other local symptoms of peritonitis such as vomiting and intestinal obstruction and other manifestations of systemic inflammation such as chills, tachycardia, tachypnea and shock, impaired liver or kidney function, or hepatic encephalopathy [8]. The diagnosis of SBP in patients with LC is not always unambiguous, since SBP is sometimes asymptomatic, and a delay in diagnosis is often fatal, including sepsis or multiple organ failure [9, 10].

Although a positive culture of ascitic fluid (AF) for a microorganism is the gold standard for the diagnosis of SBP, about 60% of cases with clinical manifestations indicating SBP and an increased number of AF polymorphonuclear leukocytes (PMNL) have negative cultures. Therefore, the number of PMNs AF ≥ 250 / μL is considered for the diagnosis of SBP, regardless of the culture results [11].

However, paracentesis is not always possible and sometimes it can take too long for the early diagnosis of SBP [13,14]. Therefore, new and useful biomarkers for the early diagnosis of SBP are desirable.

Procalcitonin (PCT) has been proposed in highly cited studies as a potentially valuable serum biomarker for the diagnosis of bacterial infections in general [15,16] and SBP in particular [17, 18].

Purpose of the study. To study the clinical and laboratory criteria of spontaneous bacterial peritonitis in liver cirrhosis of viral etiology.

Materials and methods. We examined 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. The etiologically documented diagnosis of liver cirrhosis was based on the results of detecting markers of infection with HBV viruses (HBsAg, HBc-IgM IgG, 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 (33.3%), HBV + HDV - infection - in 55 (12.5%).

Considering the clinical significance of determining the HCV genotypes, a study of the genotypes of the virus was carried out in relation to liver cirrhosis. A group of patients (85 people) was examined who, according to PCR data, had HCV RNA in their blood serum. After establishing genotypes, the following results were obtained: type 1 α was detected in 45 patients, 1b - in 19 patients, genotype 3 - in 16 patients. The combined detection of two genotypes 1b + 3 α was determined in 10 patients.

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) (GGT), the content of bilirubin, cholesterol, total protein, protein fractions, creatinine, urea, glucose, CRP and PCT in 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 liver cirrhosis according to METAVIR, a classification score scale was used. The concentration of procalcitonin (PCT) in 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. The obtained data were compared with the stack data in the recommendations for the clinical interpretation of the results of determining the PCT level in the blood serum: 0.1–0.25 ng / ml - the probability of a bacterial infection is very small; 0.25–0.5 ng / ml - local bacterial infection is possible; 0.5–2.0 ng / ml - high probability of bacterial infection, possible systemic bacterial infection; 2.0–10.0 ng / ml - a high probability of systemic bacterial infection, severe sepsis is possible; > 10.0 ng / ml - a high probability of severe sepsis [19].

During admission, all patients underwent diagnostic paracentesis followed by counting the number of neutrophils in AF and inoculation on culture media.

Results and discussion. The results of a comprehensive examination, which included clinical and biochemical studies in 120 patients with a preliminary diagnosis of LC complicated by ascites, were analyzed. There were no significant differences in age between

men and women. The clinical picture in the examined patients was characterized by general weakness (74) (61.7%), decreased appetite (75) (62.5%), nausea and vomiting (52) (43.3%), pruritus (10) (8, 3%), abdominal pain in the vast majority of patients (35) (60.3%). 22 (37.9%) patients had subfebrile fever, 3 (5.2%) - severe jaundice, 21 (36.2%) - moderate jaundice. Splenomegaly in 35 (60.3%) patients, edema in 30 (51.7%) patients. In the study of patients "spider veins" were noted in 37 (63.8%), palmar erythema in 21 (36.2%), esophageal varices in 35 (60.3%). Nosebleeds were registered in 23 (39.7%) patients. As a result of the studies, in patients with viral cirrhosis of the liver, pronounced portal block was observed in 31 (53.4%) patients. Shortness of breath with a respiratory rate of up to 30-40 per minute was observed in 26 (44.8%) patients. In 18 (31.0%) patients, tachycardia was noted, the pulse was weak, it was difficult to palpate. In 5 (8.6%) patients, he became inhibited, answers the doctor's questions in monosyllables.

When processing laboratory data, anemia of varying severity was detected in 37 patients, increased ESR in 1/2 patients, increased 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. Increased alkaline phosphatase activity was observed in 12 patients. The prothrombin index was reduced in 74 patients. In 62 patients, cirrhosis of the liver was combined with chronic cholecystitis, including in 27 cases of chronic pancreatitis. In 12 patients, chronic pyelonephritis was established, in 5 patients there was a combination of cirrhosis of the liver with gastric ulcer and duodenal ulcer.

The most common signs of SBP were fever - 36.7% (n = 44), leukocytosis with the appearance of immature forms of leukocytes - 46.7% (n = 56), dyspeptic symptoms - 61.7% (n = 74).

On the basis of 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 $\geq$ 250 cells / mm³), while in other (n = 60) patients, PMN in AF was found in a small amount ($\leq$ 250 cells / mm³), which made it possible to identify a subgroup of patients with aneutrophilic ascites. Using 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. E. coli was isolated from 11 (57.8%) and Klebsiella in 4 (21.1%).

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 developed 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 0.2-0.3 ng / ml in 26.7%, in the range of 0.5-2.0

ng / ml in 20% and in the range of 0.3-0.5 ng / ml in 36.7% of patients. In the second group of observed patients, serum PCT did not exceed 0.2 ng / ml. Serum PCT levels were recorded in the range of 0.1–0.2 ng / ml in 25% of patients and in the range of 0.05–0.1 ng / ml in 75% of patients.

Findings.

Thus, 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 decompensated cirrhosis of viral etiology.

LITERATURE

1. Wiest R, Krag A, Gerbes A (2012) Spontaneous bacterial peritonitis: recent guidelines and beyond. *Gut* 61:297–310.
2. Acharya SK (2013) Difficult to treat spontaneous bacterial peritonitis. *Trop Gastroenterol* 34:7–13.
3. Jalan R, Fernandez J, Wiest R, Schnabl B, Moreau R, Angeli P et al (2014) Bacterial infections in cirrhosis: a position statement based on the EASL Special Conference 2013. *J Hepatol* 60:1310–1324.
4. Noursbaum JB, Cadranel JF, Nahon P, Nguyen Khac E, Moreau R, Thévenot T et al (2007) Diagnostic accuracy of the Multistix 8 SG reagent strip in diagnosis of spontaneous bacterial peritonitis. *Hepatology* 45:1275–1281.
5. Oblokulov A.A. (2020) Clinical and epidemiological characteristics of spontaneous bacterial peritonitis in cirrhosis of hepatic viral etiology// *New Day in Medicine* №3 (31):423-425.
6. Dever JB, Sheikh MY (2015) Review article: Spontaneous bacterial peritonitis: bacteriology, diagnosis, treatment, risk factors and prevention. *Aliment Pharmacol Ther* 41: 1116-1131.
7. Strauss E (2014) The impact of bacterial infections on survival of patients with decompensated cirrhosis. *Ann Hepatol* 13: 7-19.
8. Piddock LJ, Planas R, Bernard B, Inadomi JM (2000) Diagnosis, treatment and prophylaxis of spontaneous bacterial peritonitis: a consensus document. *International ascites club. J Hepatol* 32(1):142–153.
9. Kang CI, Song JH, Chung DR, Peck KR, Yeom JS, et al. (2011) Liver cirrhosis as a risk factor for mortality in a national cohort of patients with bacteremia. *J Infect* 63: 336-343.
10. Oblokulov A.R., Abdulloev M. Z. (2020) To study the effectiveness of direct-acting antiviral drugs in the treatment of chronic viral hepatitis C. // *Doctor's Herald* 3.1 (96):67-71.

11. European Association for the Study of the Liver (2010) EASL clinical practice guidelines on the management of ascites, spontaneous bacterial peritonitis, and hepatorenal syndrome in cirrhosis. *J Hepatol* 53:397–417.
12. Runyon BA, AASLD (2013) Introduction to the revised American Association for the Study of Liver Diseases Practice Guideline management of adult patients with ascites due to cirrhosis 2012. *Hepatology* 57:1651–1653.
13. Gaya DR, David B Lyon T, Clarke J, Jamdar S, et al. (2007) Bedside leucocyte esterase reagent strips with spectrophotometric analysis to rapidly exclude spontaneous bacterial peritonitis: a pilot study. *Eur J Gastroenterol Hepatol* 19: 289-295.
14. Oblokulov A. A., Mukhammadieva M.I. Clinical and laboratorial characteristics of spontaneous bacterial peritonitis in cirrhosis of hepatic viral etiology // *Doctor's Herald* 3.1 (96):65-68.
15. Uzzan B, Cohen R, Nicolas P, Cucherat M, Perret GY (2006) Procalcitonin as a diagnostic test for sepsis in critically ill adults and after surgery or trauma: a systematic review and meta-analysis. *Crit Care Med* 34(7):1996–2003.
16. Oblokulov A.R., Musaeva D.M., Elmuradova A.A. (2020) Clinical and epidemiological characteristics of the new coronavirus infection (COVID-19). // *New Day in Medicine*. №2 (30/2) C.110-115.
17. Cai ZH, Fan CL, Zheng JF, Zhang X, Zhao WM, Li B et al (2015) Measurement of serum procalcitonin levels for the early diagnosis of spontaneous bacterial peritonitis in patients with decompensated liver cirrhosis. *BMC Infect Dis* 15:55.
18. Abdel-Razik A, Mousa N, Elhamady D, Elhelaly R, Elzehery R, Elbaz S et al (2016) Ascitic fluid calprotectin and serum procalcitonin as accurate diagnostic markers for spontaneous bacterial peritonitis. *Gut Liver* 10(4):624–631.
19. Meisner M. Procalcitonin – biochemistry and clinical diagnosis. Bremen: UNI-MED; 2010. 128 p.
20. BT Shavkatovich, QO Maqsudovich, SM Sayfullayevna, NN Atakulovna. Recovery of purulent injuries on the background of a diffuse toxic goitar in combination with diabetes mellitus. *International Engineering Journal For Research and Development* 5 (9), 18.12.2020. p 10-10.