

Analysis of Serum Cys-C, TBA, and Routine Blood Parameters of Patients with Hepatitis B-Related Decompensated Cirrhosis

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Abstract: *Objective:* To study the levels of serum cystatin C (Cys-C), total bile acid (TBA), and other routine blood parameters on patients with decompensated hepatitis B cirrhosis. *Methods:* Study group 1 consisted of 30 patients with hepatitis B-related decompensated cirrhosis, and study group 2 consisted of 30 patients with hepatitis B; while the control group consisted of 30 healthy people who underwent physical examination. The blood parameters were used to evaluate the clinical treatment effect of patients. *Results:* The TBA, Cys-C, alanine transaminase (ALT), total bilirubin (TBIL), aspartate aminotransferase (AST), and international normalized ratio (INR) in study group 1 were significantly higher than those of study group 2 and the control group; while the platelet count (PLT), hemoglobin (Hb), albumin (ALB), and estimated glomerular filtration rate (eGFR) were significantly lower in the study group 1 compared to the control group and study group 2 ($P < 0.05$). The Cys-C, PLT, TBA, AST, TBIL, and INR of patients in study group 1 who were successfully treated were significantly lower than the patients who were not successfully treated ($P < 0.05$). *Conclusion:* Serum Cys-C, TBA, and routine blood parameters are useful in predicting the condition and the prognosis of patients of hepatitis B-related decompensated cirrhosis.

Keywords: Serum Cys-C; TBA; Routine blood parameters; Hepatitis B-related decompensated cirrhosis

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1. Introduction

Liver cirrhosis is a common chronic liver disease, commonly caused by hepatitis B and other hepatitis virus infections. Decompensated liver cirrhosis is a serious condition that has a high mortality rate. Therefore, early detection and effective diagnosis and treatment of patients with decompensated liver cirrhosis are very important to improve their survival rate and quality of life [1-3]. Currently, the levels of serum cystatin C (Cys-C), total bile acid (TBA), and routine blood parameters in patients with decompensated hepatitis B cirrhosis have been increasingly highlighted. These indicators have certain sensitivity and specificity and are helpful for the diagnosis and treatment of patients [4-6]. This article aims to explore the serum Cys-C, TBA and routine blood parameters in patients with hepatitis B-related decompensated cirrhosis, in order to provide reference for clinical practice. In this paper, 30 patients with hepatitis B-related decompensated

cirrhosis, 30 patients with hepatitis B, and 30 healthy people with physical examination were selected, and the following reports are made:

2. Materials and methods

2.1. Information

30 patients with decompensated hepatitis B cirrhosis in the Department of Infectious Diseases and Gastroenterology of Shaanxi Provincial People's Hospital were selected from January to December 2021 and grouped as study group 1; study group 1 consisted of 15 males and females each, aged 36–59 years old, with an average age of 41.25 ± 0.65 years old; they were diagnosed in accordance with the “Chinese Guidelines on the Management of Liver Cirrhosis (2019 Edition)”^[7]. Meanwhile, 30 patients with hepatitis B were selected to form study group 2, and then 30 healthy people who underwent physical examination were selected to form a control group. The number of men and women in the study group 2 was 16 and 14, respectively, aged 35–58 (41.21 ± 0.61) years old. The number of men and women in the control group was 17 and 13, respectively, aged 32–60 (41.22 ± 0.62) years old. The research protocol has been approved by the Ethics Committee of Shaanxi Provincial People's Hospital, and all participants of this study signed the informed consent.

2.2. Methods

Serum Cys-C, TBA and blood routine indicators were measured to evaluate the effect of the clinical treatment.

2.3. Treatment effect

The treatment was effective: the symptoms were significantly relieved, the systemic edema disappeared, the ascites subsided, the alanine transaminase (ALT) and total bilirubin (TBIL) were restored to less than 2 times the normal value, and the 24-hour urine sodium was 78 mmol/L and above.

2.4. Data inspection

The SPSS25.0 statistical software was used to carry out χ^2 test, where the discrete variables were expressed in the form of percentage, and carry out t test, where the continuous variables were expressed in the form of mean \pm s. When $P < 0.05$, it is considered to be statistically significant.

3. Results

As shown in **Table 1**, The TBA, Cys-C, ALT, TBIL, aspartate aminotransferase (AST), and international normalised ratio (INR) of study group 2 and the control group were lower than those of the study group 1. However, the platelet count (PLT), haemoglobin (Hb), albumin (ALB), and estimated glomerular filtration rate (eGFR) were significantly lower in study group 1 compared to those of study group 2 and the control group ($P < 0.05$).

In study group 1, Cys-C, PLT, TBA, AST, TBIL, and Hb in patients who were successfully treated were significantly lower than those who were not successfully treated ($P < 0.05$).

Table 1. Comparison of clinical indicators among the three groups

Group	TBA ($\mu\text{mol/L}$)	Cys-C (mg/L)	ALT (U/L)	TBIL (mmol/L)	AST (U/L)	INR	PLT ($\times 10^9/\text{L}$)	Hb (g/L)	ALB (g/L)	eGFR (mg/mL)
Study group 1 ($n = 30$)	32.51 \pm 2.51	1.44 \pm 0.75	245.17 \pm 52.11	91.37 \pm 25.95	255.22 \pm 64.14	1.51 \pm 0.41	76.01 \pm 5.55	101.01 \pm 2.55	29.02 \pm 4.88	88.26 \pm 17.42
Study group 2 ($n = 30$)	15.21 \pm 0.22*	0.87 \pm 0.44*	80.24 \pm 17.44*	22.15 \pm 4.84*	90.42 \pm 22.75*	1.32 \pm 0.42*	104.02 \pm 5.21*	125.05 \pm 3.25*	32.72 \pm 5.81*	91.11 \pm 25.70*
Control group ($n = 30$)	2.41 \pm 0.55*	0.71 \pm 0.12*	18.87 \pm 2.62*	10.26 \pm 3.95*	28.42 \pm 6.95*	0.91 \pm 0.32*	133.05 \pm 2.51*	130.05 \pm 2.55*	48.16 \pm 5.28*	105.72 \pm 28.42*

Note: * $P < 0.05$ compared to study group 1

Table 2. Comparison of various indicators between patients who were successfully treated and not successfully treated in study group 1

Group	TBA ($\mu\text{mol/L}$)	Cys-C (mg/L)	WBC ($\times 10^9/\text{L}$)	ALT (U/L)	TBIL (mmol/L)	AST (U/L)	INR	PLT ($\times 10^9/\text{L}$)	Hb (g/L)	ALB (g/L)	eGFR (mg/ml)
Patients who were successfully treated ($n = 19$)	20.11 \pm 1.22	1.22 \pm 0.55	4.11 \pm 1.11	222.55 \pm 45.16	87.61 \pm 9.62	230.11 \pm 52.95	1.41 \pm 0.43	80.11 \pm 5.22	115.31 \pm 5.22	29.62 \pm 5.11	90.85 \pm 15.26
Patients who were not successfully treated ($n = 11$)	40.11 \pm 2.55	1.84 \pm 0.61	4.61 \pm 1.12	245.92 \pm 55.24	98.22 \pm 3.22	299.62 \pm 55.22	1.55 \pm 0.34	71.11 \pm 5.22	95.21 \pm 11.55	27.65 \pm 5.55	83.72 \pm 15.42
<i>t</i>	29.1516	2.8602	1.1851	1.2589	3.5228	3.4120	0.9234	4.5508	6.5723	0.9864	1.2286
<i>P</i>	< 0.05	< 0.05	> 0.05	> 0.05	< 0.05	< 0.05	> 0.05	< 0.05	< 0.05	> 0.05	> 0.05

4. Discussion

In patients with hepatitis B-related decompensated cirrhosis, the increase of serum Cys -C level is closely related to the degree of liver function damage and the prognosis of patients [8-10].

In patients with hepatitis B-related decompensated cirrhosis, elevated TBA levels usually mean severe damage to liver function and cholestasis, and also indicate that liver cell function is damaged [11-14].

In patients with hepatitis B-related decompensated cirrhosis, indicators such as white blood cell count and C-reactive protein usually increase, while indicators such as red blood cell count and hemoglobin decrease, which are related to the degree of liver function damage and the prognosis of the patient. At the same time, platelet count is also an important indicator to assess the severity of a liver disease, because in patients with decompensated liver cirrhosis, impaired liver function can lead to thrombocytopenia [15].

Detection of serum Cys-C, TBA and routine blood parameters can improve the diagnostic accuracy and therapeutic effect of patients with hepatitis B-related decompensated cirrhosis [16].

The experiments in this group showed that compared with the TBA, Cys-C, ALT, TBIL, AST, and INR of of study group 1 were significantly higher than those of study group 2 and the control group. However, the PLT, Hb, ALB, and eGFR of study group 1 were significantly lower than study group 2 and the control group ($P < 0.05$). The Cys-C, PLT, TBA, AST, TBIL, and Hb of the patients who were successfully treated in study group 1 were significantly lower than those who were not successfully treated ($P < 0.05$).

The levels of Cys-C, TBA, and routine blood parameters is helpful in predicting the condition of patients with hepatitis B-related decompensated cirrhosis and their prognosis.

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Disclosure statement

The authors declare no conflict of interest.

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