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Research Article

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The Factors Affecting the Efficacy of α-interferon in the Treatment of (CHB)

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Abstract: ***Objective:*** To analyze the factors affecting the efficacy of α-interferon in the treatment of chronic hepatitis B (CHB). ***Methods:*** A total of 100 patients with CHB treated in our hospital from June 2018 to June 2019 were selected. All patients were treated with α-interferon to evaluate the efficacy, and the factors affecting the effect of α-interferon on CHB were analyzed. ***Results:*** After treatment, 54 patients fully responded and 46 patients did not; the levels of white blood cells, HBV DNA, and HBsAg in the complete response group were lower than those in the incompletely response group, and the differences were statistically significant (P <0.05); Multivariate logistic regression analysis found that serum HBV DNA and HBsAg were independent factors affecting the efficacy of α-interferon in the treatment of CHB (OR> 1, P<0.05). ***Conclusion:*** Serum HBV DNA and HBsAg are risk factors that affect the efficacy of α-interferon in the treatment of CHB. Monitoring the changes of serum HBV DNA and HBsAg levels has important clinical significance for predicting the efficacy.

Keywords: Chronic hepatitis B; α-interferon; Affecting factors

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1 Introduction

Chronic hepatitis B (CHB) is currently a serious public health problem. Approximately 2 billion people worldwide have been infected with hepatitis, and 240 million people are CHB. About 30% of patients die from hepatic failure, cirrhosis, and hepatocellular carcinoma caused by CHB. Due to hepatitis B vaccine and antiviral treatment, the proportion of HBeAg-negative CHB patients has gradually increased in recent years[1]. However, in antiviral treatment, about 45% of patients are still not completely responded. In order to obtain better treatment outcomes, the influencing factors need to be analyzed, so that clinicians can choose a more appropriate treatment method and timing. Based on this, the purpose of this study is to analyze the factors that affect the efficacy of α-interferon in the treatment of CHB, which are shown as follows.

2 Data and Methods

2.1 General data

The 100 patients with CHB admitted in our hospital from June 2018 to June 2019 met the relevant diagnostic criteria in the Guidelines for the Prevention and Treatment of Chronic Hepatitis B[2]; the course of disease was ≥ 6 months; HBsAg or HBV DAN was positive; Excluding other types of hepatitis; Excluding patients with autoimmune diseases, liver cirrhosis, or accompanied by serious heart and kidney and other important organ lesions. Of the 100 patients, 58 were male and 42 were female; age from 33-56, with an average (41.25 ± 2.48) years of age.

2.2 Methods

All patients were treated with α-interferon (Beijing Sanyuan Gene Pharmaceutical Co., Ltd., Chinese medicine standard word S20040038), subcutaneous injection of 180 μg, once per week, continuous treatment for 6 months. Before enrollment, patients were tested for white blood cells, platelets, etc. using Japanese Hexameric Kang XT-2000i automatic blood cell analyzer; RT-PCR method was used to detect serum

HBV DNA; electrochemical luminescence was used to detect serum HBsAg titer. The kits were selected from Thermo Fisher.

2.3 Evaluation indicators

According to the curative effect, it is divided into complete response and incompletely response, and multi-factor analysis is performed. Completely response: serum transaminase levels are normal, HBV DAN is negative, HBsAg is negative or accompanied by anti-HBs positive conversion, and liver histology is mild or pathological. Incompletely response: The conditions for complete response have not been met.

2.4 Statistical methods

SPSS 23.0 software was used for data processing. Count data were expressed as percentages. χ^2 test was used, and multi-factors were analyzed by Logistic regression. $P<0.05$ was considered statistically significant.

3 Results

3.1 Efficacy

After treatment, there were 54 patients (54.00%) who completely responded and 46 patients (46.00%) who incompletely responded.

3.2 Single factors that affect efficacy

The levels of white blood cells, HBV DNA, and HBsAg in the complete response group were lower than those in the incompletely response group, and the differences were statistically significant ($P<0.05$). See Table 1.

Table 1. Single factors that affect efficacy

factors		Complete response(n=54)	Incomplete response(n=46)	t/χ^2	*P*
age	≤40	18(18.00)	16(16.00)	0.023	0.879
	>40	36(36.00)	30(30.00)		
gender	male	31(31.00)	27(27.00)	0.017	0.896
	female	23(23.00)	19(19.00)		
White blood cell($\times10^9$)	≤5.6	31(31.00)	17(17.00)	4.162	0.041
	>5.6	23(23.00)	29(29.00)		
blood platelet($\times10^9$)		134.52±22.14	128.03±21.46	1.482	0.142
HBV DNA(lg copies/mL)	≤6	42(42.00)	16(16.00)	18.850	0.000
	>6	12(12.00)	30(30.00)		
HBsAg(lgIU/mL)	≤5.5	39(39.00)	18(18.00)	11.098	0.001
	>5.5	15(15.00)	28(28.00)		

3.3 Multi-factors

Multivariate Logistic regression analysis found that serum HBV DNA and HBsAg are risk factors affecting the efficacy of α-interferon in the treatment of CHB (OR> 1, $P<0.05$). See Table 2.

Table 2. Multivariate Logistic regression analysis that affect efficacy

items		standard error	Wald	*P*	*OR*	95% confidence intervals
B		0.433	0.897	0.344	1.506	0.645-3.517
0.410	1.881	0.451	17.438	0.000	6.562	2.714-15.869
HBsAg	1.397	0.428	10.636	0.001	4.044	1.746-9.366

4 Discussion

At present, chronic hepatitis B is an incurable disease. Most patients carry the virus for life. In clinical treatment, antiviral and hepatoprotective drugs are often used to delay the progress of the disease, inhibit virus replication, promote liver cell repair, and partially block the occurrence of cirrhosis and liver cancer. Among them, interferon is currently recognized as one of the strongest antiviral drugs, in which α-interferon is a type of cytokine produced by cells under the action of interferon-inducing factors. It has strong biological activity and can induce cells to produce a variety of effector proteins with antiviral activity, producing 2`-5` Oligonucleotide synthase, which can induce the production of an RNase. It can not only directly cleave virus RNA, but also indirectly inhibit killer virus by enhancing the function of the immune system[3].

However, some patients cannot obtain a complete response after receiving α-interferon treatment, and the reason is not clear. In this study, 100 patients with CHB were treated with α-interferon and found that the complete response was 54.00% and the incomplete response was 46.00%, which is similar to most reported results. When further exploring the cause, it was found that the levels of white blood cells, HBV DNA, and HBsAg in the complete response group were lower than those in the incompletely response group, which can be seen that the levels of white blood cells, HBV DNA, and HBsAg may be influencing factors of the effect of α-interferon treatment. Among them, leukopenia is caused by neutropenia, and when neutropenia is reduced, it indicates that the infection is more serious and the control effect is not good. The presence and quantity of HBV DNA directly reflects the level of virus replication and the amount of virus, and is one of the important indicators that must be observed during the treatment of hepatitis B. HBsAg is an important toxic protein produced during HBV replication and is one of the hallmarks of hepatitis B virus infection. Its content is also affected by the immune capacity, so changes in its level can also reflect the immune status[4-5]. Multivariate logistic regression analysis found that serum HBV DNA and HBsAg are independent factors that affect the efficacy of α-interferon in the treatment of CHB. Therefore, monitoring the changes in serum HBV DNA and HBsAg levels when using α-interferon for CHB can predict the efficacy.

In summary, serum HBV DNA and HBsAg are independent factors affecting the efficacy of α-interferon in the treatment of CHB. Monitoring changes in serum HBV DNA and HBsAg levels is of great significance in predicting the efficacy.

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