Analysis of the correlation between HBV replication markers and HBV markers and liver function in patients with hepatitis B

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ABSTRACT

Objective: To investigate the correlation between HBV replication markers and HBV markers and liver function in patients with hepatitis B. Methods: A total of 273 cases of chronic hepatitis B patients in our hospital as the hepatitis B group, select 60 healthy people as control group, group monitoring of hepatitis B virus replication index (serum HBV-DNA), HBV serum markers, and monitor the liver function index of the two groups of subjects, analysis of the relationship between serum HBV-DNA level and hepatitis B markers and liver function.

Results: HBsAg (+), HBeAg (+), HBcAb (+), the positive rate of HBV-DNA was 100%, HBsAg (+), HBeAb (+), ABcAb (+), the positive rate of HBV-DNA was 47.58%, HBsAg (+), HBeAg (+), HBeAb (+), HBcAb (+) group, the positive rate of HBV-DNA was 69.44%, HBsAg (+), HBCab (+) group, positive rate of HBV-DNA was 13.64%. The positive rate of HBV-DNA in the greater Sanyang group was significantly higher than that of the other three groups. With the increase of HBV-DNA load, the serum levels of ALT and AST increased significantly, the difference was statistically significant, but there was no significant change in serum CHE level.

Conclusion: for hepatitis B patients serum HBV-DNA level in patients with regular monitoring and evaluation of the virus replication, but the HBV-DNA and the degree of liver injury and prognosis of patients with no obvious correlation, also need to pay attention to monitor liver function index of patients, thus accurate assessment and Analysis on the development of the patient's condition.

1. Introduction

At present, China's hepatitis B virus surface antigen (HBsAg) positive patients accounted for the total number of China's population of 8%-10%, according to a recent national hepatitis B epidemiology survey results show that China's 2008 HBsAg carrying rate was 7.18%, compared with 9.75% in 1992, has a lower[1,2] larger. In the clinical diagnosis of hepatitis B, the most commonly used indicators for HBV serological markers, and often hepatitis B E antigen (HBeAg) as a monitoring index to reflect the patients with antiviral therapy, but a lot of research data showed that serum HBeAg in patients with HBV cannot be accurately reflected the replication[3,4]. Hepatitis B virus replication index (hepatitis B virus DNA, HBV-DNA) is the most direct and accurate clinical evidence for HBV replication[5]. The purpose of this study is to analyze the correlation between hepatitis B virus replication index and hepatitis B markers and function.

2. Data and methods

2.1. Clinical data

In March 2015-2016 year in March in our hospital for treatment of patients with chronic hepatitis B and 273 cases as the observation group, patients with Hepatology, Chinese Medical Association of infectious diseases to the credit club "chronic hepatitis B
prevention and control guidelines of Chinese Medical Association (2015 version) in chronic hepatitis B related diagnostic criteria(6), including 171 cases of male patients, 102 female patients, age 18-59 years old, average age (38 ± 7) years old. In the same period, 60 cases of healthy physical examination in our hospital were selected as the control group, of which 39 men and 21 women were aged 18-53 years, with an average age of (36 ± 12) years. By comparison, there was no significant difference in the sex and age of the two groups (\( P > 0.05 \)). This study was approved by the ethics committee of our hospital.

2.2 Inclusion criteria and exclusion criteria

Inclusion criteria: the observation group with the diagnosis of chronic hepatitis B, the control group of the body were no exception; the age of more than 18 years; 3. Volunteer signed informed consent
Exclusion criteria: hepatitis A, hepatitis C, hepatitis B and hepatitis E patients; the combined diseases of the body may affect other liver function; the heart and lung function in patients with malignant tumor complicated with incomplete.

2.3 Detection method

The early morning venous blood 5 mL was extracted from two groups of subjects. After the separation, the serum was stored in the refrigerator at 2-8 °C, and the test was completed in 48 h.

By using real-time fluorescence quantitative method to detect 273 cases of chronic hepatitis B patients serum HBV-DNA level, HBV-DNA quantitative detection kit was purchased from Hunan San Xiang Biological Technology Co. Ltd., operating in strict accordance with the kit instructions, by using real-time quantitative PCR Roche LightCycler96 detector. In each experiment, 5 HBV-DNA standard products were set up, the set concentration distribution was 3x10^7 IU/mL, 3x10^6 IU/mL, 3x10^5 IU/mL, 3x10^4 IU/mL, 3x10^3 IU/mL, and set negative and positive control group. HBV-DNA monitoring result >5.0x10^7 IU/mL was positive.

Serum HBV markers were detected by electrochemiluminescence immunoassay, including hepatitis B virus surface antigen (HBsAg), hepatitis B virus surface antibody (HBsAb) and hepatitis B E antigen (HBeAg) and hepatitis B E antibody (HBeAb) and hepatitis B virus and antibody (HBcAb), diagnostic kit was purchased from Roche Diagnostics, the use of Roche Cobas E411 automatic electrochemiluminescence analyzer.

Use the Hitachi 7100 automatic biochemical analyzer to monitor liver function index, including aspartate aminotransferase (AST), alanine aminotransferase (ALT) and choline esterase (CHE), monitoring related reagents purchased from Hunan San Xiang Biotechnology Co. Ltd.

2.4 Statistical analyses

The data were processed by SPSS 22 software. T test was used to compare the measurement data, and \( X^2 \) test was used to compare the count data. The difference between \( P < 0.05 \) and statistics was statistically significant.

3. Results

3.1. Relationship between 2.1 serum HBV–DNA and hepatitis B markers

HBsAg (+), HBeAg (+), HBcAb (+), which is "big relief", the group of 91 patients, which were HBV-DNA positive, the positive expression rate of up to 100%; HBsAg (+), HBeAb (+), ABcAb (+), known as "small Sanyang", the group of 124 patients, of which HBV-DNA detected 59 positive cases, the positive rate was 47.58%; HBsAg (+), HBeAg (+), HBeAb (+) HBcAb (+), 36 cases of patients, of which HBV-DNA detected 25 positive cases, the positive rate was 69.44%; HBsAg (+), HBeAb (+) 22 cases of patients, of which HBV-DNA detected 2 patients with positive, positive rate was 13.64%. The positive rate of HBV-DNA in the three positive groups was significantly higher than that of the other three groups (\( P < 0.05 \)), and see Table 1.

3.2 Relationship between HBeAg and HBV–DNA

HBV-DNA positive expression rate was 88.19% for HBeAg positive patients and 45.21% for HBeAg negative patients. HBV-

<table>
<thead>
<tr>
<th>Hepatitis B markers</th>
<th>n</th>
<th>HBV-DNA positive</th>
<th>HBV-DNA Median (IU/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Positive cases</td>
<td>Positive rate (%)</td>
</tr>
<tr>
<td>HHA</td>
<td>91</td>
<td>91</td>
<td>100.00</td>
</tr>
<tr>
<td>SMA</td>
<td>124</td>
<td>59</td>
<td>47.58*</td>
</tr>
<tr>
<td>HBsAg(+), HBeAg(+), HBcAb(+), HBeAb(+)</td>
<td>36</td>
<td>25</td>
<td>69.44*</td>
</tr>
<tr>
<td>HBsAg(+), HBeAb(+)</td>
<td>22</td>
<td>3</td>
<td>13.64*</td>
</tr>
</tbody>
</table>

Table 1. Relationship between serum HBV-DNA and hepatitis B markers.
DNA positive expression rate was significantly higher in HBeAg positive patients than in HBeAg negative patients (P<0.05), as shown in Table 2.

Table 2. Relationship between HBeAg and HBV-DNA.

<table>
<thead>
<tr>
<th>HBeAg</th>
<th>n</th>
<th>positive cases</th>
<th>positive rate (%)</th>
<th>X²</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>127</td>
<td>112</td>
<td>88.19</td>
<td>55.307</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>Negative</td>
<td>146</td>
<td>66</td>
<td>45.21</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3.3 Relationships between serum HBV-DNA and liver function

With the increase of HBV-DNA load, the serum ALT and AST levels of patients were significantly increased, and the difference was statistically significant (P<0.05), while there was no significant change in serum CHE level (P>0.05), as shown in Table 3.

4. Discussion

Hepatitis B virus (HBV) as a kind of cell toxicity virus, liver cell damage caused by HBV is caused because of the immune response to HBV specific antigen, so after HBV infection caused by the different immunity function in patients with different clinical results and the state has the close relation[6]. At present, the detection of hepatitis b virus is commonly used in two-and-half detection, including HBsAg, HBsAb, HBeAg, HBeAb, HBcAb, and HBV infection can present a variety of serological models[7,8]. By real-time fluorescent quantitative PCR detection in patients with HBV DNA levels, can directly reflect the patients with the hepatitis B virus (HBV) levels in the body and compared with the traditional way, has the stronger specificity[9].

This study, according to the results of HBsAg (+), HBeAg (+), HBcAb (+), is the "big 3 this world", HBV-DNA detection rate of 100.00%, HBsAg (+), HBeAg (+), HBcAb (+), known as "small 3 this world", HBV-DNA detection positive rate was 47.58%, the HBsAg (+), HBeAg (+), HBcAb (+) group, HBV-DNA detection positive rate was 69.44%, HBsAg (+), HBcAb (+) group, HBV-DNA detection positive rate was 13.64%, the big 3 this world group of HBV-DNA detection positive rate was significantly higher than other three groups (P<0.05). Shows that big 3 this world with the hepatitis b virus inside the body has the rapid replication and the characteristics of strong infectious, and small 3 this world in patients with HBV-DNA levels in patients with average positive rate and the virus loads are lower than the big 3 this world, showed that patients with small 3 this world appears HBeAb, although the body but the body inside the replication of hepatitis b virus (HBV) has not fully stopped, may small 3 patients by the HBV replication ease or genetic variation, but it is important to note that patients with small 3 this world still has a strong infectivity[10,11].

This study analyzed HBV-DNA levels and HBeAg expression, the relationship between the results showed that HBeAg positive patients with HBV-DNA positive expression rate was significantly higher than that of HBeAg negative patients (P<0.05), which is similar to clinical findings[12], shows that in HBeAg positive patients there is a high HBV replication. In recent years, some scholars have shown that[13], for HBeAg negative and hbv-dna positive patients, the risk of cirrhosis is higher. Therefore, the use of HBV DNA in patients with HBsAg (+) - the viral replication is in the body and the HBeAg has higher sensitivity and study of the patients with hepatitis B serological patterns must be combined with monitoring HBV-DNA, can more accurately reflect the actual circumstances of the patients with HBV infection.

Studies have shown that liver tissue validation activity is strong, the body in HBV-DNA loads have increased significantly, and HBV active replication may be one of the important causes of liver tissue inflammation, so for viral replication indicators for monitoring of the patient condition judgment has the important clinical significance[14]. AST and ALT is the hepatitis b diagnosis commonly used auxiliary index, AST and ALT can to some extent reflect the degree of inflammation, so for viral replication indicators for monitoring of the patient condition judgment has the important clinical significance[14]. AST and ALT is the hepatitis b diagnosis commonly used auxiliary index, AST and ALT can to some extent reflect the degree of inflammation in the liver, with the increase of HBV-DNA loads, a significant rise in patients’ serum ALT, AST levels, statistically significant difference (P<0.05), and to reflect the prognosis and CHE indicator of liver damage and no significant correlation between HBV-DNA level[15]. Surface in patients with serum HBV-DNA level can reflect the degree of liver inflammation of the body of the patients, but with no obvious relevance and prognosis in patients with liver injury, thus for hepatitis b patients, not only need to

Table 3. Relationship between serum HBV-DNA level and liver function.

<table>
<thead>
<tr>
<th>HBV-DNA (IU/mL)</th>
<th>n</th>
<th>ALT (U/L)</th>
<th>AST (U/L)</th>
<th>CHE (U/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control group</td>
<td>60</td>
<td>23.85±5.38</td>
<td>25.56±4.33</td>
<td>8 243.7±2 163.42</td>
</tr>
<tr>
<td>&lt;5.0×10^2</td>
<td>95</td>
<td>37.21±7.33</td>
<td>42.65±8.10</td>
<td>8 326.1±2 197.53</td>
</tr>
<tr>
<td>5.0×10^2-1.0×10^3</td>
<td>89</td>
<td>47.32±10.29</td>
<td>57.38±9.24</td>
<td>8 396.4±2 173.19</td>
</tr>
<tr>
<td>1.0×10^3-1.0×10^4</td>
<td>52</td>
<td>97.48±12.31</td>
<td>69.57±15.47</td>
<td>8 317.5±2 839.4</td>
</tr>
<tr>
<td>1.0×10^4-1.0×10^5</td>
<td>37</td>
<td>139.4±15.47</td>
<td>98.75±12.39</td>
<td>8 256.5±2 546.93</td>
</tr>
</tbody>
</table>

Note: compared with control group, a P<0.05; Compared with HBV-DNA load <5.0×10^2, b P<0.05; Compared with HBV-DNA load 5.0×10^2-1.0×10^3, c P<0.05; Compared with HBV-DNA load 1.0×10^3-1.0×10^4, d P<0.05.
monitor patients with hepatitis B virus replication in body, but also need timely observation in patients with liver function, to improve the clinical prognosis.

Above all, should be regularly monitored for hepatitis B patients serum HBV DNA level, evaluation of viral replication, but HBV-DNA associated with liver damage degree and the prognosis of patients with no obvious, need to pay attention to the patients with liver function indicators monitoring at the same time, thus, an accurate evaluation of the patient's illness development and analysis.

References


