Liver Abnormality in Carriers of Hepatitis B Virus (HBV)

ABSTRACT

Background: Viral hepatitis is a first-rate human global health problem. It is far anticipated that 40% of the world’s population has had contact with or are carriers of the hepatitis B virus (HBV). The enzymes and elements that are involved in chronic liver diseases may have a direct hepatic toxicity or may be decreased as a consequence of impaired liver function.

Methods: The case-control study to investigate the abnormality in the liver of carriers with HBV was conducted in Khartoum state during the period from March to April 2016. A total of 80 donors (40 male healthy control and 40 male carriers) were enrolled to investigate the abnormality of liver function by estimating the levels of T. bilirubin, direct bilirubin, using ox method, direct bilirubin using ox method, albumin using bromocresol green method, AST using IFCC method, ALT using IFCC method and serum copper using atomic absorption spectrophotometer.

Results: The mean values of serum albumin in carriers and the control group were 4.035 g/dL ± 0.53 and 4.6175 g/dL ± 0.26, respectively. The mean values of serum copper in carriers and the control group were 0.551 mg/L ± 0.22 and 0.7003 mg/L ± 0.12, respectively. The above values were statistically significantly decreased when compared to the control group (P values 0.000). The mean values of serum T. bilirubin in carriers and the control group were 0.387 mg/dL ± 0.23 and 0.4 377 mg/dL ± 0.28, respectively. The mean values of serum direct bilirubin in carriers and the control group were 0.134 mg/dL ± 0.11 and 0.1548 mg/dL ± 0.12, respectively. The mean values of serum AST in carriers and the control group were 18.85 IU/L ± 4.02 and 22.05 IU/L ± 10.91, respectively. The mean values of serum ALT in carriers and the control group were 25.35 IU/L ± 20.91 and 21.725 IU/L ± 8.02, respectively. There were no significant differences in the mean values of bilirubin (T and D), AST and ALT when compared to control group (P values > 0.05).

Conclusion: The results presented in this study showed statistically significant decreases in both serum albumin and copper levels in carriers when compared to control group. There were no significant differences between the HBV carriers and control group regarding the levels of T. bilirubin, direct bilirubin, AST and ALT in our study.

KEYWORDS: T. bilirubin, direct bilirubin, albumin, AST, ALT, serum copper, HBV, carriers
very low concentration in the frame and contain 0.01% of overall frame weight. Those elements are worried in continual liver illnesses because those factors may have an instantaneous hepatic toxicity or may be decreased due to the impaired liver characteristics. The assessment of peculiar liver function tests consists of alanine transaminase (ALT), aspartate transaminase (AST), alkaline phosphatase (ALP), gamma glutamyl transferase, serum bilirubin, prothrombin time, or worldwide normalised ratio and serum albumin. They mirror the specific capabilities of the liver which is to excrete anions (bilirubin), hepatocellular integrity (transaminases), formation and the subsequent free waft of bile (bilirubin and ALP) and protein synthesis (albumin). The other checks are frequently completed with the aid of a specialist and consist of hepatitis serology, iron and copper studies, Α-antitrypsin tiers and autoantibodies. These relate to the possible aetiology of the abnormality. The enzymes tested are most commonly raised in the liver disease; however, a few enzymes also are present in the different tissues and consequently may be raised in different situations. The goal of this study takes a look to analyse the abnormality of liver functions in carriers with hepatitis B virus.

MATERIALS AND METHODS

The case–control study to investigate the abnormality in liver of carriers with hepatitis B virus (HBV) conducted in Khartoum state during the period from March to April 2016.

A total of 80 donors who attended the central federation laboratory for blood bank hospital (40 male healthy control, 40 male carriers) were enrolled in the study; the data were collected using direct-interviewing questionnaire. The verbal consent was obtained from each carrier, and excluding the patients with hepatitis who were under treatment.

This study was approved by the Research Ethical Committee of Faculty of Graduate Studies, Khartoum University.

Sample collection

- The blood samples were collected from the donors in a plain container under direct medical supervision. Then separated using a centrifuge to obtain the serum, and the separated serum was processed by using an enzyme-linked immunosorbent assay for detecting the hepatitis B.
- The Vandiate oxidising method (vox) was used for the estimation of total and direct bilirubin.
- The International federation of clinical chemistry and laboratory medicine (IFCC) method (without pyridoxal phosphate) was used for the estimation of ALT and AST.
- The Bromcresol green method was used for the estimation of albumin. All the above parameters were measured using mindary reagent and spectrophotometer B8200.
- The Buck model 210 VGP atomic absorption spectrophotometer was used for the serum copper.

RESULTS

The mean values of serum albumin in carriers and the control group were 4.035 g/dL ± 0.53 and 4.6175 g/dL ± 0.26, respectively. The mean values of serum copper in carriers and the control group were 0.551 mg/L ± 0.22 and 0.7003 mg/L ± 0.12, respectively. These values were statistically and significantly decreased when compared to control group (P-value = 0.000). The mean values of serum T. bilirubin in carriers and the control group were 0.387 mg/dL ± 0.23 and 0.4377 mg/dL ± 0.28, respectively. The mean values of serum direct bilirubin in carriers and the control group were 0.134 mg/dL ± 0.11 and 0.1548 mg/dL ± 0.12, respectively. The mean values of serum AST in carriers and the control group were 18.85 IU/L ± 4.02 and 22.05 IU/L ± 10.91, respectively. The mean values of serum ALT in carriers and the control group were 25.35 IU/L ± 20.91 and 21.725 IU/L ± 8.02l, respectively. There were no significant differences in the mean values of bilirubin (T and D), AST and ALT when compared to control group (P-values >0.05).

DISCUSSION

Our study showed a decreased serum copper level. The serum copper levels have been reported to be a highly sensitive in some cancer and hepatic disorders, viral hepatitis and cirrhosis. This finding is in agreement with a study of Reddy et al. The decreased serum albumin level, in this study is in agreement with a study of Limdi et al. and Lin et al. The albumin levels are dependent on a number of other factors such as the nutritional status, catabolism, hormonal factors, urinary and gastrointestinal losses and chronic liver disease.

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Mean values of T. bilirubin, direct bilirubin, albumin, AST, ALT and serum copper.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Control group</td>
</tr>
<tr>
<td>T. bilirubin</td>
<td>0.4377 ± 0.28</td>
</tr>
<tr>
<td>Direct bilirubin</td>
<td>0.1548 ± 0.12</td>
</tr>
<tr>
<td>Albumin</td>
<td>4.6175 ± 0.26</td>
</tr>
<tr>
<td>AST</td>
<td>18.85 ± 4.02</td>
</tr>
<tr>
<td>ALT</td>
<td>21.725 ± 8.02</td>
</tr>
<tr>
<td>SERUM COPPER</td>
<td>0.7003 ± 0.12</td>
</tr>
</tbody>
</table>

Data analysis: data were analysed by SPSS version 16.
CONCLUSION

The results presented in this study showed significant decrease in the serum albumin and copper levels when compared to the control group. There were no significant differences in the level of T. bilirubin, direct bilirubin, AST and ALT comparison to the control group.

ACKNOWLEDGMENTS

Feroz Awad Elkarim is very thankful to his brother Dr. Ward, his father Dr. Aldosh, his mother Jameela, his sister Dr. Shiraz, Dr. Randa, D. Hind, D. Arwa, his little sister Lolo, Dr. Omer Balla Ibrahim. He also thanks everyone in the clinical chemistry department of Khartoum University and all the laboratory staff of the Friendship Hospital for helping him in this study.

REFERENCES