Serological profiles of HBV among HIV-infected patients in Istanbul, Turkey

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Abstract

We aimed to determine the serological profiles of HBV among HIV-infected patients in Istanbul. A multicentre retrospective study has been conducted by ACTHIV-IST study group. Demographic and laboratory data were collected from the patients’ files. A total of 567 HIV/AIDS patients were included in this study. Mean age was 38.5 years ± 11.2 and 81.5% were male. Serological profiles: 8.4% had current HBV infection, 9.3% had been vaccinated and 16.8% had past infection. Parameters associated with current infection were lower CD4 counts (p < 0.05). Of 58 patients with isolated anti-HBc, 29 were tested for serum HBV DNA and 3 of them were positive. Serological profiles of HBV must be assessed among HIV-infected patients and vaccination must be offered.

Keywords: Public Health Facilities, Childhood Morbidity, Child Health, Respiratory Infections, Statistical Models

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Introduction

Worldwide, human immunodeficiency virus (HIV), hepatitis B virus (HBV), and hepatitis C virus (HCV) are major public health problems. Liver disease is currently the major concern in HIV-infected patients coinfected with hepatitis B virus (HBV) or hepatitis C virus (HCV) [7]. HBV-HIV or HCV-HIV patients have more rapid progression of liver disease than those with HBV or HCV mono-infection. End-stage liver disease, such as liver cirrhosis or hepatocellular carcinoma, is commonly observed in patients with HBV-HIV or HCV-HIV coinfec-

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Ampliprep/COBAS TaqMan HIV-1 Test, Roche Molecular Systems, USA). Demographic data including age, sex, transmission routes, and history of imprisonment, CD4+ counts, HIV RNA, HBsAg, anti-HBc IgG, anti-HBs and anti-HCV, HBV DNA, HCV RNA were collected retrospectively from medical records and were transferred to a HIV database system. Serological profiles of HBV were classified into four groups; current HBV infection, isolated anti-HBc, past infection and vaccinated. All analysis were performed by using GraphPad Prism 5.0 (GraphPad Software, Inc., San Diego, CA, USA) and SPSS 15 (SPSS Inc, Chicago, IL, USA). Data were described using mean ± standard deviation (SD) (or median and range) and as an absolute number and percentage when indicated. The student t test was used to analyze quantitative data. A P value < 0.05 was considered as statistically significant.

Results
A total of 567 HIV/AIDS patients were included in this study. Mean age was 38.5 years ± 11.2 (range: 18-79) and 81.5% were male. Four hundred twenty nine patients were tested for all HBV markers such as HBsAg, anti-HBc IgG, and anti-HBs. Serological profiles of these patients were shown in table 1: 8.4% had current HBV infection, 9.3% had been vaccinated and 16.8% had past infection. Of 58 (13.5%) patients with isolated anti-HBc, 29 were tested for serum HBV DNA and 3 of them were positive. The relationship between serological profiles of HBV and patient baseline characteristics were shown in table 2.

<table>
<thead>
<tr>
<th>HBV infection status</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>No HBV infection [ HBsAg (-), anti-HBc IgG (-), anti-HBs ( ) ]</td>
<td>223</td>
<td>52.0</td>
</tr>
<tr>
<td>Current HBV infection [ HBsAg (-), anti-HBc IgG (-), anti-HBs ( ) ]</td>
<td>36</td>
<td>8.4</td>
</tr>
<tr>
<td>Past infection [ HBsAg (-), anti-HBc IgG (+), anti-HBs ( + ) ]</td>
<td>72</td>
<td>16.8</td>
</tr>
<tr>
<td>Isolated anti-HBc seropositivity [ HBsAg (-), anti-HBc IgG (+), anti-HBs ( ) ]</td>
<td>58</td>
<td>13.5</td>
</tr>
<tr>
<td>Vaccinated [ HBsAg (-), anti-HBc IgG (+), anti-HBs ( + ) ]</td>
<td>40</td>
<td>9.3</td>
</tr>
<tr>
<td>Total</td>
<td>429</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 1: Serological profiles of HBV infection in patients infected with HIV
### Table 2: The relationship between serological profiles of HBV and patient baseline characteristics

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Group 1 (Current HBV infection) n=36</th>
<th>Group 2 (Past infection) n=72</th>
<th>Group 3 (Isolated anti-HBc) n=58</th>
<th>p Group 1 vs Group 2 vs Group 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>40.2±13.8</td>
<td>40.3±10.9</td>
<td>39.7±11.4</td>
<td>0.95</td>
</tr>
<tr>
<td>Gender (M/F)</td>
<td>31/5 (86.1%/13.9%)</td>
<td>59/13 (81.9%/18.1%)</td>
<td>50/8 (86.2%/13.8%)</td>
<td>0.76</td>
</tr>
<tr>
<td>Transmission routes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Homosexual/bisexual contact</td>
<td>8 (22.2%)</td>
<td>18 (25.0%)</td>
<td>22 (37.9%)</td>
<td>0.16</td>
</tr>
<tr>
<td>Heterosexual contact</td>
<td>22 (61.1%)</td>
<td>41 (56.9)</td>
<td>31 (53.4%)</td>
<td>0.76</td>
</tr>
<tr>
<td>Injecting drug use</td>
<td>0</td>
<td>2 (2.8%)</td>
<td>1 (1.7%)</td>
<td>NA</td>
</tr>
<tr>
<td>Blood products</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>NA</td>
</tr>
<tr>
<td>Maternal</td>
<td>0</td>
<td>2 (2.8%)</td>
<td>0</td>
<td>NA</td>
</tr>
<tr>
<td>Unknown</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>NA</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HCV coinfection (anti-HCV +, HCV RNA +)</td>
<td>0</td>
<td>2 (2.9%)</td>
<td>1 (1.7%)</td>
<td>0.60</td>
</tr>
<tr>
<td>CD4 cell counts</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 200/mm³</td>
<td>8 (22.9%)</td>
<td>32 (45.1%)</td>
<td>15 (27.3%)</td>
<td>0.032</td>
</tr>
<tr>
<td>&gt; 200/mm³</td>
<td>27 (77.1%)</td>
<td>39 (54.9%)</td>
<td>40 (72.7%)</td>
<td>1 vs 2: p=0.026, 1 vs 3: p=0.64, 2 vs 3: p=0.040</td>
</tr>
<tr>
<td>Log HIV RNA</td>
<td>5.15±0.98</td>
<td>4.98±1.17</td>
<td>4.60±1.76</td>
<td>0.51</td>
</tr>
<tr>
<td>ALT</td>
<td>159.1±423.0</td>
<td>28.4±21.6</td>
<td>31.2±25.9</td>
<td>0.004 1 vs 2: p=0.005, 1 vs 3: p=0.009, 2 vs 3: p=0.99</td>
</tr>
</tbody>
</table>

### Discussion

Worldwide, about 90% of HIV-infected patients have biological signs of prior HBV infection, and 5%-15% suffer from chronic infection. Turkey is classified as an intermediate HBV, low HIV endemic region. The estimated overall HBV infection prevalence is 4.57%. Although, many studies have been published about the prevalences of HBV infection among different populations in Turkey, there is insufficient data in HIV-infected patients. In this first study, we investigated the prevalence and epidemiological features of HBV coinfection in HIV-infected Turkish individuals. A total of HIV-infected patients, 8.4% had chronic hepatitis B and 16.8% had resolved HBV infection. In our study, current HBV infection in HIV-infected patients is more common than in the general population. This may be caused by similarities in routes of transmission and risk factors between HBV and HIV.

We observed a significant association between having a lower CD4 cell count and current HBV infection. This result supports the fact that most immunocompromised patients are unable to control their HBV infection, and/or these patients may experience HBV reactivation. The alternative explanation to our observation could be that HBV co-infections may have caused further damage to the patients’ immune system which can subsequently boost HIV replication and lower CD4 counts.

Isolated anti-HBc is another common serologic pattern in HIV-infected patients. In published studies from different regions, the prevalence of isolated anti-HBc in HIV-infected populations ranged from 10.6-45%. The significance of this serological pattern is unclear. It may represent either 1) resolved HBV infection with loss of anti-HBs, 2) a false positive test result, or 3) occult chronic HBV infection. In our country, the prevalence of isolated anti-HBc in general population ranges between 3%-5% in the previous studies. In this study, isolated anti-HBc was determined in 58 (13.5%) HIV-infected patients and this serologic profile was significantly more frequent than general population. The prevalence of occult infection in HIV-infected pa-
tients with isolated anti-HBc ranged from 0% to 89.5% ([13,14,17,23,24]).
In our study, of patients with isolated anti-HBc, 29 were tested for
serum HBV DNA and 3 (10.3%) of them had occult infection. The differ-
ence of prevalence may be related with the regions, risk factors, use of
ART and the sensitivity of the biology techniques.

Conclusion
Current HBV infection and isolated anti-HBC prevalences are high
among our HIV-infected patients. Parameters associated with current
HBV infection were lower CD4 counts and increased ALT levels. Occult
HBV infection was identified in 10.3% of patients with isolated anti-HBC
tested for HBV DNA.
Serological profiles of HBV must be assessed among HIV-infected
patients and HBV vaccination must be offered in those without HBV
markers. Determination of HBV DNA should be performed in patients
with isolated anti-HBc to rule out the presence of occult infection.

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