SEROPREVALENCE OF HEPATITIS B AND C AMONG SELECTED GROUPS OF POPULATION AT COMBINED MILITARY HOSPITAL, OKARA, PAKISTAN

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ABSTRACT

Objective: To determine the prevalence of hepatitis B virus (HBV) and C virus (HCV) infection in selected population groups at Combined Military Hospital (CMH), Okara, Pakistan.

Study design: Descriptive cross-sectional study.

Place & duration of study: Department of pathology and the blood bank of CMH, Okara, from January to December 2015.

Materials and Methods: Healthy blood donors and the candidates presenting for medical checkups before induction in Pakistan army were sampled consecutively. Blood samples were collected from arm veins and screened by Enzyme-Linked Immunosorbent Assay for hepatitis B surface antigen (HBs Ag) and anti-HCV antibodies.

Results: The prevalence of HBV infection in blood donors and the candidates for induction in Pakistan army was different from other Pakistani studies. The prevalence of HCV infection was similar to the majority of previous studies.

Conclusion: The prevalence of HBV infection in blood donors and the candidates for induction in Pakistan army was different from other Pakistani studies. The prevalence of HCV infection was similar to the majority of previous studies.

Keywords: Anti hepatitis C virus antibody, Army candidates, Blood donors, Hepatitis B virus, Hepatitis B virus surface antigen, Hepatitis C virus, Okara, Pakistan, Prevalence.

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INTRODUCTION

Viral hepatitis is an issue affecting people all over the world. In 2013, it had been ranked the seventh leading cause of death worldwide rising from 10th position in 1990 [1]. According to the World Health Organization, there are 350 million people with chronic hepatitis B virus (HBV) infection and 170 million people with chronic hepatitis C virus (HCV) infection worldwide [2,3]. These viruses lead to chronic lifelong infection that may cause cirrhosis, hepatic decompensation and hepatocellular carcinoma [4]. In Pakistan, the situation is worse, as the mainstream population, due to poverty, is unable to sustain the expensive and extensive treatment. There are 2.5% people with HBV and 4.9% people with HCV infection respectively [5]. The transmission of HBV and HCV is through parenteral routes that includes blood transfusion, intravenous injections and sexual contact [6]. Most of these individuals remain asymptomatic and are a potential source of infection [6].

The tests used for diagnosis of HBV and HCV infections are Immunochromatography Test (ICT), Enzyme-linked Immunosorbent Assay (ELISA), and Polymerase Chain Reaction. ELISA is use to confirm the ICT positive cases as it is more specific [7].

Numerous epidemiological studies regarding the prevalence of HBV and HCV infections have been carried out in the past in different parts of the world and few studies have also been conducted in different areas of Pakistan. The aim of this study was to assess the prevalence of HBV and HCV infection in healthy blood donors and the candidates applying for induction in Pakistan army who reported for
medical checkups in Combined Military Hospital (CMH), Okara, Pakistan.

MATERIALS AND METHODS

This study was conducted at the department of Pathology and the blood bank, CMH, Okara from January to December 2015. All blood donors with no apparent health problems and without history of HBV or HCV infection were included in the study. Similarly, all male candidates reporting for medical evaluation as a pre-requisite before induction in Pakistan army were also included. The candidates hailed from rural or semi urban areas surrounding Okara district. They were all in the age bracket of 18-23 years and had been educated till 10th grade of formal education at local schools.

About 3 ml blood sample from dorsal palmar or antecubital veins was taken from each individual and kept in a gel bottle with proper labeling. Serum was separated from the clotted blood after centrifugation and tested for HBV surface antigen (HBsAg) and anti-HCV antibodies by ELISA and the intensity of reaction was photometrically analyzed. Positive and negative controls were run with each batch of samples.

The data were collected on written proformas and analyzed using statistical package for social sciences version 20. Descriptive statistics were computed for demographic variables for the whole screened population.

RESULTS

A total of 1728 healthy blood donors were recruited. There were 1720 (99.5%) male and 8 (0.5%) female. In male donors, HBsAg was positive in 0.04% and anti-HCV antibodies were positive in 3.7%. All female donors were negative for HBsAg and anti-HCV antibodies. (Table 1)

From 2951 male candidates who reported for screening against HBV and HCV infection, HBsAg positivity was 2.43% (n=72) and anti-HCV antibodies were positive in 3.96% (n=117). (Table 1).

Table 1: Table showing the prevalence of HBsAg and anti-HCV antibodies in different sampled groups.

<table>
<thead>
<tr>
<th>Groups</th>
<th>Sample size n (%)</th>
<th>Seropositivity for HBsAg</th>
<th>Seropositivity for anti-HCV antibodies</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Positive n (%)</td>
<td>Negative n (%)</td>
</tr>
<tr>
<td>Blood Donors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>1720 (99.5)</td>
<td>16 (0.04)</td>
<td>1704 (99.06)</td>
</tr>
<tr>
<td>Female</td>
<td>8 (0.5)</td>
<td>0</td>
<td>8 (100)</td>
</tr>
<tr>
<td>Candidates</td>
<td>2951</td>
<td>72 (2.4)</td>
<td>2879 (97.6)</td>
</tr>
</tbody>
</table>

Table 2: Table showing studies from 2009 to 2014 reporting prevalence of HCV infection in healthy blood donors from different areas of Pakistan.

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Sample size</th>
<th>Prevalence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abbas et al12</td>
<td>2009</td>
<td>804</td>
<td>15.05</td>
</tr>
<tr>
<td>Jadoon et al13</td>
<td>2010</td>
<td>10000</td>
<td>4.90</td>
</tr>
<tr>
<td>Shah et al14</td>
<td>2010</td>
<td>32042</td>
<td>1.57</td>
</tr>
<tr>
<td>Khan et al15</td>
<td>2011</td>
<td>7148</td>
<td>1.89</td>
</tr>
<tr>
<td>Safi et al16</td>
<td>2011</td>
<td>62251</td>
<td>2.60</td>
</tr>
<tr>
<td>Borhani et al17</td>
<td>2011</td>
<td>5717</td>
<td>1.90</td>
</tr>
<tr>
<td>Ansari et al18</td>
<td>2012</td>
<td>5517</td>
<td>2.00</td>
</tr>
<tr>
<td>Attaullah et al19</td>
<td>2012</td>
<td>127828</td>
<td>2.46</td>
</tr>
<tr>
<td>Bhutta et al20</td>
<td>2012</td>
<td>100</td>
<td>12.00</td>
</tr>
<tr>
<td>Irfan et al21</td>
<td>2013</td>
<td>108598</td>
<td>2.61</td>
</tr>
<tr>
<td>Khan et al22</td>
<td>2013</td>
<td>356</td>
<td>20.8</td>
</tr>
<tr>
<td>Akhtar et al23</td>
<td>2013</td>
<td>245</td>
<td>15.00</td>
</tr>
<tr>
<td>Moiz et al24</td>
<td>2014</td>
<td>42830</td>
<td>1.65</td>
</tr>
</tbody>
</table>
DISCUSSION

Viral hepatitis is one of the most common viral infections of human beings and poses a major threat to the humanity. It is a global issue and 12 to 15 million people are infected each year. Acute hepatitis caused by all hepatitis viruses appears similar, however, HBV and HCV may lead to chronic infection. It is estimated that global prevalence of HCV infection is 3.3% [8]. Pakistan is highly endemic for HCV infection where the prevalence has been reported to be 10% [8,9].

One of the principal observations of our study was a prevalence of 0.04% for HBsAg in blood donors which is lower as compared to other studies. This might be due to the fact that most blood donors at the military hospitals are from the military itself, as the military personnel are bound to donate blood at regular intervals if they meet a good health criteria. The purpose is to keep the blood bank with enough reservoir of blood to meet the requirements of blood in case of war or mass casualties. The military personnel are always inducted following a strict medical health selection criteria, therefore, the prevalence of a screened communicable disease is expected to be lower in the military personnel than the general population.

The prevalence of 3.7% for anti-HCV antibody in blood donors is similar to two Pakistani studies carried out on blood donors in Islamabad [10] and Lahore [5] that have shown a seroprevalence of 3.31% and 3.6% respectively. However, a very recent review [11] including studies from 2009 to 2014 [12-24] (Table-2) has shown a variable range of seroprevalence ranging from 1.57 to 20.8%.

In the candidates for induction in Pakistan army, the prevalence was 2.43% for HBsAg and 3.96% for anti-HCV antibodies. Azam et al. [25] found a similar prevalence for anti-HCV antibodies but a slightly different prevalence for HBsAg. Similarly, a comparable prevalence was observed by Mirza et al. [26] for anti-HCV antibodies and HBsAg. In 2010, a study by Bosan et al. showed a prevalence range of 3-7.3% for HBsAg and 2.2-5.2% for anti-HCV antibodies in candidates [27]. In 2009, a review by Akbar et al. found the prevalence of anti-HCV antibodies around 4 - 10% in Pakistan [8].

The seroprevalence of HBV and HCV infection is considered unpredictable, as they are transmitted sporadically and in micro-epidemics and there is a wide variation within a country, province or even in a community [28,29]. Similar studies conducted in various regions of Pakistan showed a dissimilarity in seroprevalence i.e. 9% in Mardan, 13.33% in Dera Ismail Khan and 4-6% in Karachi [30]. In 2012, Umar et al. stated that prevalence of HCV infection varied between four provinces, that is, Punjab had 6.7%, Sindh had 5%, Baluchistan had 1.5%, and Khyber Pakhtunkhwa had 1.1% prevalence respectively [31].

So far, no vaccination is available for HCV prevention and only solution to prevent its further spread is through identification of these highly prevalent areas along with the cause. General population awareness and practicing standard operating procedures in all clinics, hospitals and blood banks are the need of the hour.

This study is limited by selection bias as the sample did not depict true picture of the population and might underestimated the population prevalence.

CONCLUSION

The prevalence of HBV infection is 0.04% for blood donors and 2.43% in candidates for induction in Pakistan army and is different from other Pakistani studies. The prevalence of HCV infection is 3.7% in blood donors and 3.96% in candidates and similar to the majority of previous studies.
AUTHORS CONTRIBUTION

Sunila Tashfeen Arif contributed in conception and design, data collection, and manuscript writing.

Saeed Bin Ayaz contributed in manuscript writing, data analysis, data interpretation, literature research, and manuscript revision.

Muhammad Farooq contributed in conception and design, and manuscript revision.

REFERENCES


