Hepatitis B Virus Infection in Blood Donors

*Pathology Department, Islamabad Medical and Dental College, Islamabad;** Armed Forces Institute of Pathology, Rawalpindi;***Army Medical College, Rawalpindi

Abstract

Background: To find out the frequency of hepatitis B virus (HBV) infection in blood donors and to analyze it’s trend over a five year period in Pakistan.

Methods: In this retrospective and descriptive study screening of all blood donors was done to separate healthy donors from unhealthy donors by a questionnaire and blood complete picture. Apparently healthy subjects of 18 years or more with a hemoglobin level of twelve or more were allowed to donate blood. Sera were checked for the presence of hepatitis B surface antigen (HBsAg).

Results: A total of 246,611 patients blood were screened during the five years of our study. The frequency of HBV was 1.63%. The overall frequency of HBV showed a statistically significant decreasing trend over the five years of our study.

Conclusion: The decreasing trend in the frequency of HBV in blood donors is a positive aspect and should be further sustained.

Key Words: Hepatitis B virus infection, blood donors

Introduction

Blood and blood products are integral at all levels of health care system. The objective of blood transfusion is to ensure safety, adequacy, accessibility and efficiency of blood supply at all levels. With a population of over 160 million, around 1.5 million bags are annually transfused in Pakistan. Hepatitis B virus (HBV), hepatitis C virus (HCV), human immunodeficiency virus (HIV) and syphilis are the most serious infections transmitted during blood transfusion. Human immunodeficiency virus (HIV), hepatitis B virus (HBV) and hepatitis C virus (HCV) are of great concern because of their prolonged viremia and carrier or latent state. The above mentioned infection also cause fatal, chronic and life-threatening disorders.

HBV is highly contagious and can easily be transmitted from one infected individual to another by various routes including blood transfusion, unsafe sex, by using contaminated syringes and by horizontal transmission. Around 2 billion individuals are infected with HBV globally and about 350 million are living with chronic infection. Approximately 600,000 deaths are attributed to the acute or chronic infections of HBV each year. In Pakistan 7 million people are estimated to be carriers of HBV. Childhood infections lead to liver cancer or cirrhosis in 25% of adults due to chronic HBV.

Subjects and Methods

A retrospective study of blood donors’ records covering the period between January 2007 and December 2011 was conducted at Armed Forces Institute of Transfusion (AFIT). Blood donors were either volunteers or replacement donors who were patients’ families, or friends to replace blood used or expected to be used for patients from the blood bank of the hospital. Initially screening of all the potential blood donors was done to separate healthy donors from those who cannot donate. Apparently healthy subjects of 18 years or more with a hemoglobin level of twelve or more were allowed to donate blood. Blood from each donor was analyzed for HBV, HCV and syphilis. Sera were checked for the presence of hepatitis B surface antigen (HBsAg) using Architect HBsAg Qualitative II according to manufacturing protocols. Linear regression was used to assess the statistical significance of trends in frequency of HBsAg positivity over the study period. A p value of less than 0.05 was considered statistically significant.

Results

Blood samples of a total of 246,611 donors were screened in AFIT during January 2007 till December 2011. The prevalence of HBsAg was calculated to be 1.63%. Frequency of reported HBV infection was the highest amongst donors registered during year 2007(Table 1; Figure 1). A decrease in the frequency observed from 2007 till 2009, followed by a rise in 2010 but a decline was again registered during 2011 (Table 1; Figure 1). The decreasing trend in HBsAg positivity
amongst blood donors during the five years of our study was statistically significant (p<0.001).

<table>
<thead>
<tr>
<th>HBV</th>
<th>Total No. of patients screened</th>
<th>HBsAg Positives No. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>43084</td>
<td>790 (1.83%)</td>
</tr>
<tr>
<td>2008</td>
<td>47288</td>
<td>798 (1.68%)</td>
</tr>
<tr>
<td>2009</td>
<td>50427</td>
<td>801 (1.58%)</td>
</tr>
<tr>
<td>2010</td>
<td>51151</td>
<td>837 (1.63%)</td>
</tr>
<tr>
<td>2011</td>
<td>54661</td>
<td>788 (1.44%)</td>
</tr>
<tr>
<td>Total</td>
<td>246611</td>
<td>4014 (1.63%)</td>
</tr>
</tbody>
</table>

Figure 1: Trend of HBsAg positivity amongst blood donors from 2007 to 2011.

Discussion

Screening is an important indicator of prevalence of infections in the blood donating and to some degree the general population.

Table 2: Reported data on the frequency of HBV, HCV and syphilis from different areas of Pakistan

<table>
<thead>
<tr>
<th>Reference</th>
<th>Years</th>
<th>Area of study (City) country</th>
<th>Total Sample of study</th>
<th>HBsAg % positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sultan F et al.</td>
<td>1996-2005 (Lahore) Pakistan</td>
<td>41,496</td>
<td>2.42</td>
<td></td>
</tr>
<tr>
<td>Attaullah S et al.</td>
<td>2008-2011 (Peshawar) Pakistan</td>
<td>1,27,528</td>
<td>2.68</td>
<td></td>
</tr>
<tr>
<td>Khan S et al.</td>
<td>2009-2010 (Peshawar) Pakistan</td>
<td>1,601</td>
<td>3.12</td>
<td></td>
</tr>
<tr>
<td>Present study</td>
<td>2007-2011 (Rawalpindi) Pakistan</td>
<td>246,611</td>
<td>1.63</td>
<td></td>
</tr>
<tr>
<td>Saghir SAM et al.</td>
<td>2008-2010 (Lahore) Pakistan</td>
<td>1,483</td>
<td>2.46</td>
<td></td>
</tr>
<tr>
<td>Pallavi P et al.</td>
<td>2004-2008 India</td>
<td>30,060</td>
<td>1.27</td>
<td></td>
</tr>
<tr>
<td>Giri P et al.</td>
<td>2009-2010 India</td>
<td>3601</td>
<td>0.89</td>
<td></td>
</tr>
</tbody>
</table>

Blood transfusion is an integral part of the health care system but it also serves as an important route for transmission of infections. The frequency for HBV infection was found to be highest in Peshawar. Our study reported HBV infection to be less frequent among blood donors. The decreasing trends for HBV as indicated by our study were also shown by a study in our country done at Lahore by Sultan F. Two Indian studies also showed a decrease in trend for HBV in blood donors. Gupta et al reported a relatively constant rate of infection in blood donors for HBV. The same decreasing trend for HBV was also reported in a two-year study conducted at Yemen but the decrease was slight and not statistically significant, while our study showed a statistically significant decrease (Table 2).

Conclusion

1. Measures should be taken to control hepatitis B infection, as it is an easily preventable disease through readily available vaccination.
2. The decreasing trend in the frequency of HBV in blood donors is a positive aspect and should be further sustained.

References