Seroprevalence of Hepatitis B in Male Blood Donors in Rural Teaching Hospital of Northern Maharashtra, India

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ABSTRACT

Aim: This study was aimed to know the seroprevalence of hepatitis B infection in male blood donors.

Material & Methods: The present retrospective hospital record-based study was conducted at the blood bank of a rural tertiary care teaching hospital in northern Maharashtra, India over a period of 4 &1/2 years from January 2010 to June 2014. All the blood units collected were screened for HBV, HCV, HIV 1 and 2, syphilis and malaria. The data of HBsAg alone was analyzed with chi square test and results were considered significant if P value was < 0.05.

Results: The overall seroprevalence rate was 1.63% among the total 3920 blood donors included in this study. The correlations of seroprevalence rate among selected age groups and in voluntary and replacement blood donors were found to be statistically insignificant. Conclusion: The lower seroprevalence rate in this study, further recommends strict abiding to donor selection criteria, comprehensive screening of blood donors, better awareness among donors and reintensification of prophylactic programmes at public level to ensure the safe blood donation.

Keywords: Blood donation, Hepatitis B, Hepalisa, Seroprevalence
INTRODUCTION
Hepatitis B virus (HBV) infection is a global health problem and it is estimated by the World Health Organization (WHO), approximately one-third of the world population has been infected with HBV with serological evidence of past or present infection\(^1\). HBV infection is the leading cause of chronic hepatitis, cirrhosis, and hepatocellular carcinoma (HCC)\(^2\). As per WHO guidelines, Countries are classified on the basis of endemicity of HBV infection into high (≥8%), intermediate (2 to 7%) or low (≤2%) incidence countries. The prevalence of chronic HBV infection in India ranges from 2 to 10%. India therefore comes under the intermediate to high endemicity category\(^3\). A high endemicity of HBV infection has been reported in the tribal populations of India which has been attributed to inbreeding, poor hygienic living conditions, close person-to-person contact and certain socioculture practices which may facilitate transmission of HBV\(^4\).

This infection is transmitted mainly through blood and blood products, vertically from mother to neonates and body secretions\(^2\). Blood transfusion associated hepatitis B viral infection continues to be a major problem in India even after adoption of mandatory screening of hepatitis B surface antigen (HBsAg) by enzyme-linked immuno-sorbent assay (ELISA)\(^5\). The study of seroprevalence rate of hepatitis B in blood donors is a crucial index for assessing the magnitude of HBV infection and the disease trend in the general population. Further more such study gives us guidance as to what further is to be done in our public education and improving prophylactic measures including vaccination and nucleic acid testing (NAT). A teaching Hospital patient based study is helpful in assessing true nature of problem in the community. To the best of our knowledge, there is no such study has been carried out recently on seroprevalence of hepatitis B infection in northern Maharashtra. Keeping these facts in mind, the present study is aimed to know the seroprevalence of hepatitis B infection among male blood donors in this area.

MATERIAL AND METHODS
The present retrospective hospital record-based study conducted at the blood bank of a rural tertiary care teaching hospital in northern Maharashtra, India. Data was collected over a period of 4 &1/2 years from January 2010 to June 2014. In this period, 3920 voluntary and replacement male blood donors (blood donated to replace blood utilized, and often includes friends or relatives of patients) were included in the study. Donors were selected by the standard criteria for donor fitness. Persons belonging to high risk groups such as patients from thalassemia clinics, sexually transmitted diseases clinics, professional blood donors, drug abusers, dialysis patients, sex workers, pregnant women, etc. were excluded from the study. All the blood units collected were screened for HBV (HBsAg), hepatitis C virus (HCV), human immunodeficiency virus (HIV) 1 and 2, syphilis (VDRL) and malaria. The screening for HBsAg in all the serum samples
collected were performed using commercial kits based on the microwell ELISA (Hepalisa, J.Mitra and Co. Pvt. Ltd. India) as per the manufacturer’s instructions. The data of HBsAg alone was analyzed with chi square test and results were considered significant if P value was < 0.05.

**RESULTS:**
Among the total 3920 blood donors included in this study, voluntary blood donors were 77.72% and 22.27% were replacement donors. The overall seroprevalence rate in the present study was 1.63% with higher in voluntary donors (1.77%) in comparison to replacement donors (1.14%) as shown in table 1. Age wise seroprevalence was found to be more in 18 to 26 years group with 1.66% (Table 2).

**Table 1: HBsAg positivity with respect to type of blood donor**

<table>
<thead>
<tr>
<th>Blood donor</th>
<th>Total No.</th>
<th>HBV (+)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VD</td>
<td>3047(77.72%)</td>
<td>54</td>
<td>1.77</td>
</tr>
<tr>
<td>RD</td>
<td>873(22.27%)</td>
<td>10</td>
<td>1.14</td>
</tr>
<tr>
<td>TOTAL NO.</td>
<td>3920</td>
<td>64</td>
<td>1.63</td>
</tr>
</tbody>
</table>

VD – Voluntary blood donor, b) RD – Replacement blood donor

**Table 2 : Age group wise HBsAg positivity in blood donors**

<table>
<thead>
<tr>
<th>Age group</th>
<th>Total No.</th>
<th>HBV (+)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-26</td>
<td>839</td>
<td>14</td>
<td>1.66</td>
</tr>
<tr>
<td>27-35</td>
<td>1662</td>
<td>27</td>
<td>1.62</td>
</tr>
<tr>
<td>36-44</td>
<td>800</td>
<td>13</td>
<td>1.62</td>
</tr>
<tr>
<td>45-53</td>
<td>486</td>
<td>08</td>
<td>1.64</td>
</tr>
<tr>
<td>54-60</td>
<td>133</td>
<td>02</td>
<td>1.50</td>
</tr>
<tr>
<td>TOTAL</td>
<td>3920</td>
<td>64</td>
<td>1.63</td>
</tr>
</tbody>
</table>

**DISCUSSION**
In India the HBsAg prevalence among different populations and geographical areas varies greatly and very high prevalence has been noted among the aborigine population of Andaman and in Arunachal Pradesh. The overall seroprevalence rate 1.63% found among total 3920 male blood donors included in our study was in concurrence with the previous report by Bhattacharya P et al (1.66%), Iram Manzoor et al (1.70%) and 1.7% in the study of Dimple Arora et al. Our finding was also comparable with seroprevalence of 1.5%, 1.8 % and 1.09% in the study of Archana S. Bembde et al, Singh et al and Purushottam A.
Giri et al\textsuperscript{12} respectively. Some of the studies from Maharashtra region, as conducted by SS Patil et al\textsuperscript{13}, Mudholkar Vishal G et al\textsuperscript{14} and Sonwane BR et al\textsuperscript{15} were reported higher seroprevalence rate of 2.99\%, 2.90\%, 2.78\% respectively in comparison to our study. Lack of awareness and carrier state seems to be the reason for this higher seroprevalence. The seroprevalence rate reported in the studies of Chattoraj A et al\textsuperscript{16} (0.99 \%) and Karandeep Singh et al\textsuperscript{3} (0.62 \%) were lower than the present study due to high literacy rate, awareness about the disease and modes of prevention, implementation of strict pre-donation counseling and donor selection criteria help in excluding the possibly infected donors. The higher seroprevalence rate in age group 18-26 years observed in this study was not statistically significant but comparable with Tessema B et al\textsuperscript{17}, Baba et al\textsuperscript{18} Zulficar et al\textsuperscript{19} and Sayed A. Quadri et al\textsuperscript{20}. Higher seroprevalence in youth in our study, needs further reintensification of preventive programmes aimed at high risk behavioural change, as this is the most productive and economically viable group of population. The higher seropositivity in voluntary donors than replacement donors in the present study was not statistically significant. This high seropositivity in voluntary donors than replacement donors can be comparable to the study conducted by Chattoraj et al\textsuperscript{21} and S Gulia et al\textsuperscript{22} but shows variance from other studies\textsuperscript{23,24,25} which showed a higher seropositivity in replacement than voluntary donors. The reason could be probable inclusion of professional blood donors.

**CONCLUSION**

The lower seroprevalence rate in this study, further recommends comprehensive screening of blood donors with recommended method, strict donor selection criteria, better education of donors and improved prophylactic measures at public level to ensure the safe blood donation.

**REFERENCES**


