

## Seroprevalence of HBsAg among blood donor's in Dinajpur Medical College, Dinajpur

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Hepatitis B virus infection is a global health problem. About 350 to 400 million people are chronically infected with hepatitis B in the world. This is a retrospective study carried out in the department of Transfusion Medicine, Dinajpur Medical College Hospital, Dinajpur, during the period 1<sup>st</sup> January 2010 to 31<sup>st</sup> December 2010, among the blood donors who attended for blood donation. During this period 12,914 patients attended the department for transfusion. Among them 12,014 were male and 900 were female, age range was 18 to 60 years. Among them professional donors were 955, voluntary donors were 4494 and replacement donors were 7556 and HBsAg was positive in 0.42%, 0.87% and 1.11% respectively. Overall prevalence was 0.98%. The aim of this study was to determine the prevalence of HBsAg among blood donors. Blood samples were collected from 12914 healthy donors. All donors were pre-screened by a questionnaire provided by the institution and passed the physical examination conducted by the medical officer in charge. Blood donors data and results of HBsAg were analyzed using the blood bank's records. There was an overall prevalence of 0.98% of HBsAg(+) among all the tested blood donors. There was statistically significant difference between sexes. These results stress the importance of screening programs that must be implemented.

[Dinajpur Med Col J 2013 Jan; 6 (1):28-32]

**Key words:** HBsAg, Blood Donor, Hepatitis B

### Introduction

Hepatitis has become an issue of global importance, and in Bangladesh, hepatitis B virus infections still remain a public health problem. Those who have the infection may develop chronic hepatitis eventually leading to cirrhosis and hepatocellular carcinoma.<sup>1</sup> In a study done by Freeman<sup>1</sup>, after 20 years of chronic hepatitis infection, an estimate of 5% of patients will develop cirrhosis if they are infected at an age younger than 40 years, and an estimate of 20% if infected at an age greater than 40 years. Several studies were conducted on the prevalence of hepatitis B and C in different regions. In a study

conducted by the World Health Organization, an estimated 2 billion people have been infected with hepatitis B at some time in their life worldwide.<sup>2</sup> The prevalence of hepatitis B infection varies in different regions. In Bangladesh, the prevalence of HBsAg(+) reported a value of 8% in IV drug users,<sup>3</sup> and a value of 9.7% in commercial sex workers<sup>4</sup> and 5.9% in truck drivers.<sup>5</sup> In Mexico, a survey done showing a prevalence of hepatitis B virus to be 6.6% for the core antigen.<sup>6</sup> In Taiwan, a community-based study conducted showed that 13% were HBsAg positive.<sup>7</sup> Another study done among the residents in

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Tayside Scotland showed that 3.74% were HBsAg (+).<sup>8</sup> This study aims to determine the prevalence of hepatitis B among healthy blood donors at Dinajpur Medical College values obtained will be compared with those previously reported local studies and with the prevalence rates of other countries. An estimated 350–400 million people in the World are chronically infected with hepatitis B virus.<sup>9</sup> Approximately, 15–40% may develop serious sequelae, like cirrhosis and hepatocellular carcinoma within 5 years.<sup>10</sup> Patients with hepatic inflammation and fibrosis are at the highest risk of complications.<sup>11</sup> With a population of 150 million, Bangladesh has a high HBsAg positivity in adults (7.3–7.5%).<sup>12,13</sup> Among patients with active viral replication, cirrhosis will developed in 15 to 20 within 5 years. For patients with cirrhosis, acute exacerbation can occur, the disease may progress and the incidence of hepatocellular carcinoma greatly increased. 70%–90% of hepatocellular carcinoma occur against background of cirrhosis.<sup>14,15</sup> The yearly incidence of HCC in HBV injected persons without cirrhosis is 0.5%, whereas it is 2.5% in HBV infected patients with cirrhosis. The aim of treatment of cirrhotic patients are to stop the disease progression, hepatic decompensation hepatocellular carcinoma, spontaneous bacterial peritonitis and bleeding oesophageal varices. In Bangladesh most HBV infection occurs in childhood and younger populations with a high rate of inter familial HBV infection and the low rate of history of acute hepatitis.<sup>16</sup> Chronic infection developed in 90% of neonates infected with hepatitis B, in 20%–50% of children below the age of 10 but in only 2%–7% of adults.<sup>17,18</sup> At present, treatment option for CHB include antiviral agents and immuno-modulating agents. Antiviral agents include lamivudine, adefovir, entecavir, telbivudine, tenofovir and immunomodulating agents include IFN or peg IFN. These drugs not only improves the

clinical, biochemical and virological respons but also improves the histological activity of liver. Bangladesh is a densely populated country with about 150 million populations were HBsAg positivity in healthy adult population is 7.2–7.5%<sup>18</sup>. So, early detection of HBsAg among the healthy population can save many lives from dangerous complication of cirrhosis and hepatocellular carcinoma by proper treatment. The goal of this study was to detect HBsAg positive donors and advised them for treatment accordingly.

### Methods

This retrospective study was carried out in the department of transfusion medicine, Dinajpur Medical College Hospital, Dinajpur, during the period 1<sup>st</sup> January 2010 to 31<sup>st</sup> December 2010, among the blood donors who attended for blood donation. During this period 12,914 patients attended the department for transfusion. Among them 12,014 were male and 900 were female, age range was 18 to 60 years. Among them professional donors were 955, voluntary donors were 4494 and family replacement donors were 7556. All donors were pre-screened by a questionnaire provided by the institution and passed the physical examination conducted by the medical officer. Blood donors' data and results of HBsAg were obtained using the blood bank's records of donors. The donors were stratified according to gender and age groups. All of the 12914 population were screened for HBsAg.

### Statistical tests

The prevalence of HBsAg (+) were obtained. The data were presented in percentages. Differences in prevalence between genders were evaluated for significance using the student's t-test, while the analysis of variance was used in evaluating significant difference among the age groups.

## Results

From 1<sup>st</sup> January 2010 to 31<sup>st</sup> December 2010 a total number of 12914 healthy blood donors at Dinajpur Medical College, Dinajpur, Bangladesh were screened for HBsAg. Among those screened for HBsAg, 12014 (93.04%) were males and 900 (6.96%) were females. Among the 12914 donors, professional donors 955, voluntary donors 4494 and family replacement donors were 7556. HBsAg positivity was detected in 0.42%, 0.87% and 1.11%. The average HBsAg positivity among the blood donors was 0.98%. Among the male population, the prevalence was 1% while that of the female population yielded 0.77%. Statistically, there was significant difference on the prevalence of HBsAg (+) according to gender. The female gender of blood donors is only 6.96% of the total blood donors. Table 1 presents the prevalence of HBsAg (+) among blood donors according to gender.

Table I. Prevalence of HBsAg (+) among the blood donors

	Professional donors	Voluntary donors	Replacement donors	Average Percentage
Male	955	4494	7556	
Female	705	4244	7056	
HBsAg %	0.42%	0.87%	1.11%	0.98%

## Discussion

In this study, the prevalence of Hepatitis B infection obtained was 0.98%. This is lower compared to the 7.2%–7.5% HBsAg positivity in healthy adult population in Bangladesh. There is decreasing trend of hepatitis B prevalence resulting from behavioral changes that have led to decreased transmission of infection. Due to public awareness of HBV hepatitis known infected person did not participate in the donation programme. Among the 12914 healthy blood donors, only 900 (6.96%) were females compared to 12014 (93.04%). Males,

statistical analysis showed significant difference on hepatitis B prevalence according to gender. Literature also mentions that hepatitis B infection is more common in men than in women. Majority of the donors who tested positive for hepatitis B were between 18-30 years old (60.23%) which is in keeping with the peak prevalence occurring between ages 10 and 29. Prevalence on the other hand was at 0.12%. From previous study done in Cebu, reported prevalence was 10.38%.<sup>19</sup> Factors that may contribute to the wide discrepancy include ethnic mix of population, frequency of injection drug use and the proportion of the population that engages in high risk behavior. Infection is proportionally associated with high-risk sexual behavior, taking into account the number of sexual partners<sup>3</sup>. In other countries, several studies were also conducted on the prevalence of hepatitis B in blood donors. In Egypt, the prevalence of hepatitis B among blood donors was 39.4%, while hepatitis C showed a value of 24.8%<sup>20</sup>. These values were higher compared with the values obtained in this study. A similar study was conducted in Indonesia with hepatitis B prevalence of 8.8%,<sup>18</sup> and in Ghana, blood donor population showed that 15% were chronic carriers of hepatitis B. The prevalence of HBsAg positive among healthy blood donors is apparently high. These results underlie the importance of screening programs in identifying blood-borne pathogens which pose a threat to potential recipients. Most developing countries, including Bangladesh are facing several threats to the safety of their blood supply. Screening for hepatitis viruses should be done most especially in high-prevalence areas, since up to 20% of the collected blood might be unsafe<sup>3</sup>. Both hepatitis B and C are blood-borne pathogens which could be transmitted by the parenteral route. Sometimes, infection results in chronic asymptomatic carrier state for several years before the development of

symptoms. Hepatitis-infected blood donors may not be aware of their condition and therefore, have the potential to infect patients. Follow up on blood donors who tested positive should also be done and if feasible to screen family members as they are at high risk for infection, due either to intrafamilial transmission or because they share risk factors for infection. Accurate identification and clinical management of both blood donors and family members would reduce the probability of transmission, preventing further dissemination in the community. In comparison to other studies, low prevalence rate in our study may be due to public awareness regarding hepatitis B virus and infected patients know that they should not donate blood and did not participate in blood donation programme. Immunization against hepatitis B virus is currently included in the routine childhood immunization programme. This will eventually reduce the prevalence of viral hepatitis and its sequelae. Also, with the improvement of public health facilities, health education and safe blood transfusion prevalence of HBsAg will reduce further.

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