

Original Article

## Seroprevalence of HBsAg among blood donor's in Sher-E-Bangla Medical College, Barisal.

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### Abstract

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, Sher-E-Bangla Medical College Hospital, Barisal, during the period 1st January to 31st December 2007, 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 at Sher-E-Bangla Medical College, Barisal. 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.

### 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 differ-

ent 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 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 Sher-E-Bangla 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 immunomod-

ulating agents. Antiviral agents include lamivudine, adefovir, entecavir, telbivudine, tenofovir and immunomodulating agents include IFN or peg IFN. These drugs not only improve the clinical, biochemical and virological responses but also improve the histological activity of liver. Bangladesh is a densely populated country with about 150 million population where 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 complications of cirrhosis and hepatocellular carcinoma by proper treatment. The goal of this study was to detect HBsAg positive donors and advise them for treatment accordingly.

## Materials and methods

This retrospective study was carried out in the department of transfusion medicine, Sher-E-Bangla Medical College Hospital, Barisal, during the period 1st January to 31st December 2007, 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 12,914 population were screened for HBsAg.

## Statistical tests

The prevalence of HBsAg (+) were obtained. The data were presented in percentages. Differences in prevalence between gender 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 January 2007–31st December 2007 a total number of 12,914 healthy blood donors at Sher-E-Bangla Medical College, Barisal, Bangladesh were screened for HBsAg. Among those screened for HBsAg, 12,014 (93.04%) were males and 900 (6.96%) were females. Among the 12,914 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.

## 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 a 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 persons did not participate in the donation programme. Among the 12,914 healthy blood donors, only 900 (6.96%) were females compared to 12,014 (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 a 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 a 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-in-

ected 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 showed 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.

**References**

1. Freeman AJ, Dore GJ, et al. Estimating progression to cirrhosis in chronic hepatitis C virus infection. *Hepatology* 2001; 34: 809-816.
2. World Health Organization. Communicable/Infectious Disease: Hepatitis B. WHO Fact Sheet. 204. November 1998.
3. Mustafa M, Islam MN, et al. Prevalence of Hepatitis B surface antigen (HBsAg) among parenteral drug abusers at Dhaka. *Bangladesh Med Res Council Bulletin* 1989; 15:1-7.
4. Sattar H, Islam MN. Hepatitis B virus markers among prostitutes of Dhaka. *Bangladesh Med Res Council Bull* 1996; 22:8-11. *Phil J of Gastroenterology* 2006; 2:64:70 Rodenas J, Bacasen L, Que E 70.
5. Gibney L, Saquib N, et al. Human immunodeficiency virus, hepatitis B, C and D in Bangladesh's trucking industry: prevalence and risk factors. *International Journal of Epidemiology* 2001; 30:878-884.
6. Cisneros-Castolo M, Hernandez-Ruiz L, et al. Prevalence of hepatitis B virus infection and related risk factors in rural community of Mexico. *American Journal of Tropical Medicine and Hygiene* 2001; 65: 759-763.

7. Wang CS, Chang TT, et al. Comparison of Hepatitis B virus and Hepatitis C virus prevalence and risk factors in a community-based study. *American Journal of Tropical Medicine and Hygiene* 2002; 66:389-393.
8. Steinke DT, Weston TL, et al. Epidemiology and economic burden of viral hepatitis: an observational population based study. *Gut* 2002; 50:100-105
9. Custer B, Sullivan SD, Hazlet TK, Iloeje U, Veensta DL, KowdleyKV. Global epidemiology of hepatitis B virus. *J Clin Gastroenterol* 2004; 38:S158-S168.
10. Ganen D, Prince A M. Hepatitis B virus infection- natural history and clinical consequences. *N Engl J Med* 2004; 350:1118-1129.
11. Yim HJ, Lok ASF. Natural history of chronic hepatitis B virus infection: what we knew in 1981 and what we know in 2005. *Hepatology* 2006; 43:S173-181.
12. Islam M N, Islam KMN, Islam N. Hepatitis B virus in Dhaka, Bangladesh. *Bangladesh med res. Council Bull* 1984; 10:1-6.
13. Khan M, Ahmed N. Seroepidemiology of HBV and HCV in Bangladesh. *Int Hepatol Commun* 1996; 5:27-29.
14. Fattovich G, Brollo L, Giustina G, et al. Natural history and prognostic factors for chronic hepatitis type B. *Gut* 1991; 32:294-8.
15. Beasley RP. Hepatitis B virus: the major etiology of hepatocellular carcinoma. *Cancer* 1988; 61:1942-56.
16. Alam S, Ahmad N, Mustafa G, Alam K, Khan M. Characteristics of treatment naïve chronic hepatitis B in Bangladesh: Younger populations are more effected; e antigen negatives are more advanced. *Saudi J Gastroenterol* 2008; 14:15-19.
17. Hsu Hy, Chang MH, Lee CY, et al. Spontaneous loss of HBsAg in children with chronic hepatitis B virus infection. *Hepatology* 1992 ; 15 : 382.
18. Conjeevaram HS, Di Bisceglie AM. Management of chronic viral hepatitis in children. *J Pediatr gastroenterol Nutr* 1995 ; 20 : 365.
19. Estalilia OC. Antibodies against Hepatitis C virus among blood donors at a private hospital in Cebu. *Cebu Doctors Proceedings* 1992; 8:2.
20. Arthur RR, Hassan NF, et al. Hepatitis C antibody prevalence in blood donors in different governorates in Egypt. *Transactions of the royal society of Tropical Medicine and Hygiene* 1997; 91: 271-274.

Table 1. Prevalence of HBsAg (+) among the blood donors:

	Professional donors	Voluntary donors	Replacement donors	Average Percentage
	955	4494	7556	0.98%
Male	705	4244	7056	
Female	150	250	500	
HBsAge %	0.42%	0.87%	1.11%	