

Prevalence of Hepatitis B Virus Seromarkers and Associated Risk Factors in Young Healthy Individuals in Bangladesh: Implications for Preventive Strategies

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Dear Editor,

Hepatitis B virus (HBV) is one of the major causes of chronic hepatitis and can lead to severe liver diseases, including hepatocellular carcinoma and cirrhosis-related end-stage liver disease. Nearly 350 million people around the world are estimated to be chronically infected with HBV. According to statistics, 5% -10% and 90% of acutely infected adults and neonates become chronic carriers of HBV, respectively (1-3).

Bangladesh has an intermediate prevalence of HBV infection. However, there is inadequate information on the prevalence of HBV infection in the young healthy population, and most studies have been performed on selected groups of people with more risk factors (4-7). In this regard, two recent studies have reported HBV prevalence in the general population (8, 9).

Chronic HBV infection tends to show no symptoms (asymptomatic or carriers). Accordingly, people are often unaware of the fact that they are infected with the virus unless they are screened during blood donation or vaccination. In fact, chronically infected patients remain undetected for many years, thereby increasing the possibility of disease transmission. In addition, healthy individuals should be screened for HBV during vaccination and before blood donation. Although hepatitis B surface antigen (HBsAg) positivity is the earliest marker of HBV infection, hepatitis B core antibody (HBcAb) is a very important marker of exposure to HBV infection, as it persists even after recovery (10).

The prevalence of HBV infection is rapidly increasing in Bangladesh due to lack of health education, illiteracy, poverty, and lack of knowledge about HBV vaccination. In Bangladesh, a national policy has been adopted for many years in order to reduce the prevalence of HBV. It includes universal HBV vaccination for all infants and HBsAg screen-

ing before blood donation and vaccination. In order to assess the impact of mass neonatal vaccination against HBV, in this pilot study, we investigated the prevalence of HBV seromarkers and the associated risk factors in young healthy individuals.

This descriptive cross sectional study comprised of 156 young healthy university students. Informed consents were obtained from all the participants, and the institutional ethical review committee approved the study protocol. The students were interviewed, using a predesigned questionnaire, which consisted of demographic information, common HBV acquisition risk factors, perceptions about HBV vaccination, and vaccination status.

Two blood samples were collected from each subject at the medical center of North South University. The samples were transferred to the Biochemistry and Immunology Laboratory. The sera of all the samples were tested for HBsAg, HBcAb, and hepatitis B surface antibody (HBsAb), using the third-generation ELISA kit. Data analysis was performed using SPSS version 20.0.

Among 156 subjects (mean age, 21 ± 2 years; male: female ratio, 98:34), none were found positive for HBsAg (0.0%). However, 15 (9.6%) were found positive for HBcAb and 51 (32.7%) were found positive for HBsAb. Among 15 HBV-exposed subjects, 6 (40%) had protective antibodies against HBV (HBsAb). Investigation of HBV-associated risk factors showed that 9% of the subjects had a history of household contact and a habit of sharing personal objects (eg, towel and razor). In addition, 1.9% of the subjects had body piercing and tattooing experiences, and 6.4% had a history of either surgical operation or blood transfusion.

Regarding the history of HBV vaccination, 28.2% of the subjects had received vaccine, 24.4% were uncertain about it, and 47.4% had not received vaccination (Table 1). The subjects (n, 82), who had a history of vaccination and were

unsure about their vaccination status, were analyzed for the presence of protective antibodies against HBV; HBsAb > 10 mIU/mL was considered as the protective state. Based on the findings, 62% of the subjects had protective antibodies, whereas 38% did not.

Table 1. Frequency of Hepatitis B Virus (HBV) Seromarkers, Risk Factors, and Vaccination History Among the Subjects^a

	Frequency	95% CI
HBV Markers		
HBsAg	0 (0.0)	100 - 100
HBcAb	15 (9.6)	5.1 - 14.7
HBsAb	51 (32.7)	25.0 - 40.4
HBcAb/HBsAb	6 (40.0)	13.3 - 66.7
Risk factors		
Household contact		
No	118 (75.6)	68.5 - 82.7
Yes	14 (9.0)	4.4 - 14.1
Unknown	24 (15.4)	10.3 - 20.6
IV drug abuse		
No	147 (94.2)	89.7 - 97.5
Yes	9 (5.8)	2.5 - 10.3
Body piercing or tattooing		
No	153 (98.1)	95.5 - 100
Yes	3 (1.9)	0.0 - 4.5
Blood transfusion/surgery		
No	144 (92.3)	87.2 - 96.2
Yes	10 (6.4)	2.6 - 12.2
Unknown	2 (1.3)	0.0 - 3.2
History of vaccination		
Vaccinated	44 (28.2)	
Not vaccinated	74 (47.4)	
Unsure	38 (24.4)	

Abbreviations: CI, confidence interval; HBcAb, hepatitis B virus core antibody; HBsAb, hepatitis B surface antibody; HBsAg, hepatitis B surface antigen.

^aValues are reported as No (%).

In our study population, prevalence of exposure to HBV was lower than that reported among healthy adults and children (9.6% vs. 21.1%) (11). Also, the prevalence was much lower than the rates reported in high-risk groups in Dhaka, Bangladesh: commercial sex workers, 73%; non-injectable drug users, 24.1%; injectable drug users, 31.8%; women living near truck stands, 49.3%; women at STD clinics, 35.2%; and truck drivers and helpers, 48.1% (6, 7, 12-14).

The study reported a prevalence of 0% for HBsAg in

young healthy subjects. According to previous research, the prevalence of HBsAg positivity was 7.2% in 1984 and 7.5% in healthy Bangladeshi adults (4, 15). Reduction in the prevalence rate (to 5.5%) was demonstrated in another study in 2008, performed on a larger proportion of the general population, residing near the border of Dhaka (8). The prevalence of HBsAg (0%) and reduced exposure to HBV observed in the study, might indicate the successful implementation of HBV vaccination under the nationwide Expanded Program of Immunization (EPI).

The population in the present study included very young North South University students, who mostly lived in modern urban areas and had a high socioeconomic status. Therefore, this population might have been exposed to neonatal HBV immunization. As the findings revealed, 28% of the subjects had a history of HBV vaccination. The reduced prevalence of HBV infection might be also due to the following factors: public awareness, mandatory blood screening before donation and vaccination of negative individuals, mandatory screening of pregnant women, and family screening of known carriers.

A significant proportion of the study population had knowledge about HBV vaccination; however, 38% were found to be unprotected. Also, 60% (9/15) of HBV-exposed individuals did not have protective antibodies against HBV (χ^2 , 19.35, $P \leq 0.001$). Based on these findings, it can be revealed that although the majority of subjects were aware of HBV vaccination, they had no information about monitoring protection against HBV via HBsAb tests.

In conclusion, the present results demonstrated the reduced prevalence of exposure to HBV in young healthy individuals, compared to the general population studied elsewhere in Bangladesh. HBV-exposed individuals did not have any protective antibodies against HBV. Absence of HBsAg in the subjects was suggestive of successful vaccination at birth and implementation of nationwide awareness programs. Therefore, we recommend active HBcAb screening and vaccination programs (with HBV protection monitoring) for adolescents and young adults in Bangladesh.

Implications for Health Policy/Practice/Research/Medical Education: the present study assessed the impact of mass neonatal HBV vaccination on the prevalence of HBV infection among young adults. The results demonstrated the effective implementation of vaccination at birth and nationwide awareness programs. Therefore, we recommend that policymakers implement different HBcAb screening and vaccination programs (with HBV protection monitoring) for adolescents and young adults in Bangladesh and other countries.

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Footnotes

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