Original Article

Hepatitis B Virus Core Antibody and Anti-HBs Status of HBsAg Negative Persons Working in a Diagnostic Center in Sylhet, Bangladesh

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Abstract

Background: Hepatitis B virus (HBV) infection is a significant global health concern. Exploring the serological markers of HBV infection, particularly the core antibody (anti-HBc), in HBsAg-negative individuals is crucial for understanding their prior exposure to the virus and possible risk of transmissibility.

Materials and Methods: This cross-sectional study was conducted at the Department of Gastroenterology, Sylhet MAG Osmani Medical College, Sylhet, Bangladesh, from July 2022 to December 2022 to assess the frequency of hepatitis B virus core antibody status among HBsAg-negative persons working in a diagnostic center in Sylhet, Bangladesh. In this study, 51 individuals who tested negative for HBsAg were included as the study subjects. The sample selection process utilized a purposive sampling technique, and data analysis was performed using MS Office tools.

Results: In this study, the prevalence of anti-HBc antibodies among participants was found to be 17.65%. Within the ≤30 years age group, 15% of cases exhibited reactivity, while in the >30 years age group, the reactivity was found in 27% of cases. Regarding the gender-specific distribution of anti-HBc status, among males, 12.5% had a reactive status, while among females, 36.4% exhibited reactivity.

Conclusion: In this study, among the HBsAg negative subjects, the frequency of Anti-HBc positivity was higher in the older age group and in females. Though these associations are not statistically significant, they might provide an insight into further research in this field.

Keywords: Hepatitis B virus, HBsAg negative, Anti-HBc antibodies

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Introduction:

Hepatitis B virus (HBV) is a highly prevalent viral infection.[1] Some countries have adopted anti-HB core (HBc) assays to detect chronic carriers with low-level viremia but lacking detectable HBsAg.[2] Despite the screening methods applied, it was observed that HBV infection can still occur even in the absence of HBsAg, which is known as occult HBV infection (OBI).[3]

This phenomenon is becoming increasingly recognized in several clinical settings worldwide. OBI may be an antibody positive-anti-HBc alone or together with anti-HBs (seropositive OBI) or antibody negative (seronegative OBI).[4] The Taormina Consensus Conference in 2008 further defined "OBI" as the "presence of HBV DNA in the liver of individuals testing HBsAg negative with currently available assays" and introduced a cutoff value for serum HBV DNA (< 200 IU/mL).[5]

OBI can cause fulminant hepatitis. It is associated with the development of hepatocellular carcinoma and cryptogenic liver disease. It can also affect the disease progression of chronic hepatitis C virus (HCV) patients.[6] Previously, detection of anti-HBc antibodies was rarely done as it was not mandatory.[7] But, patients with occult HBV infection, who lack detectable HBsAg with anti-HBc positivity and HBV DNA, are a potential source of HBV infection.[8] HBV can also be transmitted when the liver is transplanted from an HBsAg-negative, anti-HBc-positive patient, which proves that the liver harbors infectious HBV in some patients negative for HBsAg but positive for anti-HBc.[9] OBI carriers with high anti-HBs levels are unlikely to transmit the infection, whereas those with "anti-HBc only" might transmit the infection.[10]

The objective of this study was to assess the frequency of hepatitis B virus core antibody among HBsAg-negative persons working in a diagnostic center in Sylhet, Bangladesh.

Materials and Methods:

This cross-sectional study was conducted at the Department of Gastroenterology, Sylhet MAG Osmani Medical College, Sylhet, Bangladesh, from July 2022 to December 2022. This study included 51 individuals with negative HBsAg results. The participants, of both genders and aged between 18-65

years, were selected using a purposive sampling technique. Before data collection, explicit and informed consent was obtained from each participant.

The participants underwent screening for HBsAg through both rapid diagnostic test (RDT) and enzyme-linked immunosorbent assay (ELISA), and anti-HBc was assessed using ELISA. Exclusion criteria for this study comprised individuals unwilling to participate, those below 18 years of age, and patients testing positive for HBsAg. Comprehensive demographic and clinical information of the participants was recorded. The data underwent processing, analysis, and dissemination using MS Office tools.

Results:

This study involved 51 individuals with negative HBsAg results who were employed at a diagnostic center in Sylhet, Bangladesh. In this study, an examination of the age distribution among the study subjects revealed that most of the participants (80%) belonged to the age group of <30 years, while the remaining 20% were from the >30 years age group (Table 1).

Table 1: Distribution of study subjects according to age (N=51)

Age (Years)	Number (Percentage)
≤30	41 (80)
>30	10 (20)

Upon analyzing the gender distribution of the study subjects, it was observed that the predominant majority of participants (78%) were male, while the remaining cases (22%) were female (Figure 1).

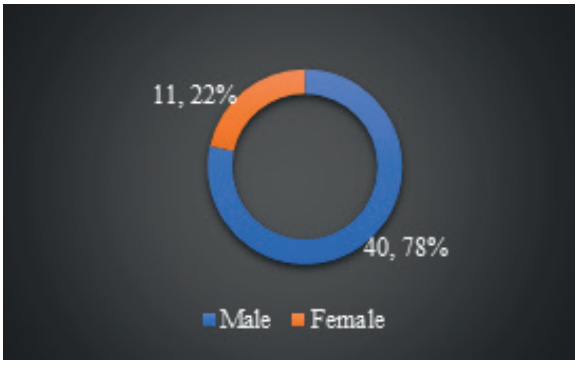

Figure 1: Distribution of study subjects according to gender (N=51)

During the assessment of the prevalence of anti-HBc antibodies among participants, it was noted that the frequency of cases with anti-HBc antibodies was 17.65% (Figure 2).

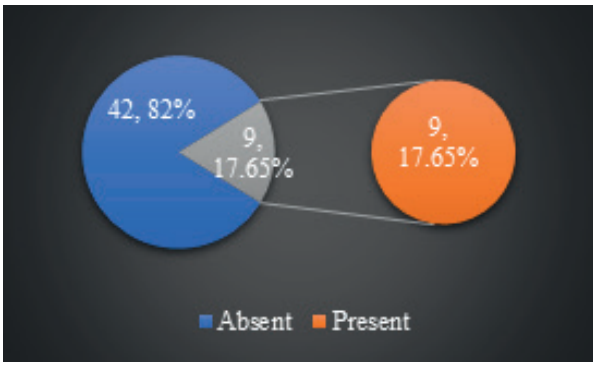

Figure 2: Prevalence of anti-HBc antibodies among participants

In examining the distribution of anti-HBc status, it was noted that within the ≤30 years age group, 15% of cases were reactive, while 85% tested negative. Conversely, in the >30 years age group, 27.3% were reactive, and 72.7% tested negative for anti-HBc (Table 2).

Table 2: Age-wise anti-HBc antibodies status distribution (N=51)

	Age ≤30 years	Age >30 years	p value*
HBsAg status	(n=40)	(n=11)	
	Number (Percentage)	Number (Percentage)	0.30
Reactive	6 (15.0)	3 (27.3)	
Negative	34 (85.0)	8 (72.7)	

*Chi-Square test was done to see the level of significance.

In terms of the gender-specific distribution of anti-HBc status, it was observed that among males, 12.5% had a reactive status, while 87.5% tested negative. In contrast, among females, 36.4% showed a reactive status, and 63.6% tested negative for anti-HBc (Table 3).

Table 3: Gender-wise anti-HBc status distribution

	Male	Female	p value*
HBsAg status	(n=40)	(n=11)	
	Number (Percentage)	Number (Percentage)	0.067
Reactive	5 (12.5)	4 (36.4)	
Negative	35 (87.5)	7 (63.6)	

*Chi-Square test was done to see the level of significance.

Discussion:

This study aimed to assess the frequency of hepatitis B virus core antibody among HBsAg-negative persons working in a diagnostic center in Sylhet, Bangladesh. In the present study, the analysis of the age distribution among the study subjects revealed that a substantial majority (80%) fell within the <30 years age group, with the remaining 20% belonging to the >30 years age group. In contrast, a different study demonstrated that 61.2% of their participants were from the <30 years age group and 38.8% were from the >30 years age group.[11]

Upon examining the gender distribution of our study subjects, it was noted that the significant majority (78%) were male, while the remaining cases (22%) were female. A study conducted by Fasola et al. reported a similar pattern where 86.5% of participants were male, and 13.5% were female.[12]

In our study, the assessment of the prevalence of anti-HBc antibodies among participants revealed that the frequency of cases with anti-HBc antibodies was 17.65%. A nearly similar finding of 14.6% was observed in another study.[13] Additionally, the prevalence of anti-HBc total antibodies among HIV-positive individuals in a study in eastern India, reported a prevalence of 17.8%, which finding is similar to our study.[14] Furthermore, in our study, an examination of the distribution of anti-HBc status showed that within the ≤ 30 years age group, 15% of cases were reactive, while, in the >30 years age group, 27.3% were reactive, for anti-HBc. A prior study reported that the proportion of participants aged 18–35 years with a positive anti-HBc was lower (42.2%) compared to participants above 36 years (61.8%), aligning with the findings in the current study.[12] Conversely, dissimilar observations were noted in another study conducted in Nepal.[15] In our study, regarding the gender-specific distribution of anti-HBc status, it was observed that among males, 12.5% had a reactive status while among females, 36.4% showed a reactive status. In a study conducted in India by Asim et al., no difference in the seroprevalence of the core antibody between male and female donors was reported (19.3% vs. 18%).[16] This finding does not align with the results of our study. Despite variations in results of our study when compared to other studies, both similarities and dissimilarities could contribute valuable insights for further similar studies.

This study was conducted at a single center and involved a relatively small sample size. Additionally, the study duration was limited to a short period. Consequently, it is important to acknowledge that the findings of this study may not accurately represent the broader scenario across the entire country.

Conclusions:

The analysis of findings from this study sheds light on the prevalence of anti-HBc antibodies in HBsAg-negative individuals employed in a diagnostic center in Sylhet, Bangladesh. The overall prevalence is notably not very high, indicating a potential level of resilience or low exposure within this specific occupational group. Nevertheless, the disparities in prevalence among age groups and genders are noteworthy. The higher prevalence among individuals aged over 30 years implies a potential cumulative risk over time, while the elevated prevalence among females compared to males warrants further exploration and consideration in public health strategies. These insights underscore the importance of targeted interventions and ongoing surveillance to effectively manage and mitigate the risk of hepatitis B in this specific population.

Conflicts of Interest: There is no conflict of interest.

Acknowledgements: We would like to extend our heartfelt gratitude to the study participants for their valuable time and support.

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