

Socioeconomic And Occupational Trends In Hepatitis B Virus Infection: A Hospital-Based Analysis

*Dr. Md. Bellal Hossain¹, Dr. Sharmin Sultana², Dr. Md. Bodrul Alam³,
Dr. Md. Abdul Bari⁴, Dr. Md. Rabiul Awal⁵

¹Junior Consultant, Department of Medicine, Mugda Medical College Hospital, Dhaka, Bangladesh

²Junior Consultant, Department of Medicine, National Institute of Diseases of The Chest and Hospital (NIDCH) Dhaka, Bangladesh

³Junior Consultant, Department of Medicine, Mugda Medical College Hospital, Dhaka, Bangladesh

⁴Registrar, Department of Neurology, Dhaka Medical College Hospital, Dhaka, Bangladesh

⁵Junior Consultant, Department of Medicine, Adhunik Sador Hospital, Natore, Bangladesh

Abstract

Background: Hepatitis B is a highly contagious liver disease affecting nearly one-third of the global population, with Bangladesh facing a significant burden. This study seeks to fill the gap in understanding the role of socioeconomic and occupational factors in HBV infection, particularly within a hospital-based population, by exploring how these factors influence HBV transmission and outcomes in a hospital setting.

Aim of the study: The aim of the study was to analyze the socioeconomic and occupational factors influencing Hepatitis B Virus infection in a hospital-based population.

Methods: This hospital-based observational study was conducted at the Departments of Medicine and Hepatology at BSMMU and DMCH, Dhaka, from June to September 2012. Using purposive sampling, 100 adult patients with serologically confirmed HBV infection were enrolled after consent. Suspected cases were assessed by physicians and data were collected through structured interviews and HBsAg testing. Participants were categorized by education, socioeconomic status and transmission sources. Data were analyzed using SPSS 17.0.

Results: The study of 100 hepatitis B patients showed a higher prevalence in the 18-47 age group (76%), with males (72%) more affected. Most were married (55%) and from low socioeconomic backgrounds (59%), with 66% residing in rural areas. Farmers (20%), students (12%) and unemployed individuals (12%) were the most affected occupations. Education levels were low, with 35% being illiterate.

Conclusion: This study calls for urgent targeted interventions addressing socioeconomic and occupational disparities to combat HBV's disproportionate impact on young rural males, farmers and low-income populations in Bangladesh.

Keywords: Hepatitis B, Socioeconomic Factors, Occupational Trends, Chronic Infection.

Corresponding Author: Dr. Md. Bellal Hossain, Junior Consultant, Department of Medicine, Mugda Medical College Hospital, Dhaka, Bangladesh

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I. Introduction

Hepatitis B is a highly contagious liver disease caused by the hepatitis B virus (HBV), which can manifest as both acute and chronic conditions. It is estimated that nearly one-third of the global population is exposed to HBV during their lifetime, with approximately 296 million people living with chronic infection worldwide.[1] The disease can present in a variety of forms, from asymptomatic chronic carriers to individuals who develop severe complications such as cirrhosis and hepatocellular carcinoma (HCC).[2] HBV infection is a major cause of primary liver cancer, responsible for up to 80% of such cases and is the leading cause of cancer-related deaths globally.[3] The virus accounts for approximately 5% of global mortality, with most chronic HBV carriers facing a lifelong risk of developing cirrhosis and/or HCC.[4] Despite the availability of an effective vaccine, HBV remains endemic in many parts of the world, including Bangladesh which is considered a high-burden country. While the global prevalence of HBV varies, regions like Bangladesh, with an intermediate prevalence rate of 2-6%, continue to face significant public health challenges related to the disease.[5]

Socioeconomic and occupational factors play a crucial role in determining the prevalence and transmission of HBV infection. The prevalence of HBV is particularly high in lower- and middle-income countries.[6,7] where regional differences in infection rates are influenced by factors such as education, income and access to healthcare. Research has shown that individuals from lower socioeconomic backgrounds, such as

manual laborers, are more likely to be infected with HBV, while those in self-employment or working in the public sector tend to face a lower risk. In countries with lower socioeconomic status, factors like illiteracy and limited healthcare access are associated with higher infection rates.[8] The World Health Organization (WHO) has set ambitious targets to increase the diagnosis and treatment of chronic hepatitis B infections, aiming to diagnose 90% of those infected by 2030.[9] Understanding the complex relationship between socioeconomic factors and HBV infection is essential for effective public health planning, as it can help guide the development of targeted prevention strategies for at-risk populations and inform policies aimed at reducing the global burden of HBV.

Despite significant research on Hepatitis B virus (HBV) and its global impact, there remains a gap in understanding the role of socioeconomic and occupational factors in HBV infection, particularly within a hospital-based population. While studies have generally focused on prevalence rates and clinical outcomes, few have specifically examined how these factors contribute to HBV transmission and outcomes in hospital settings. This study seeks to fill this gap by exploring the influence of socioeconomic and occupational trends on HBV infection in a hospital-based setting. The findings aim to inform public health strategies tailored to high-risk groups, improving prevention and intervention efforts.

Objective

The objective of the study was to analyze the socioeconomic and occupational factors influencing Hepatitis B Virus infection in a hospital-based population.

II. Methodology & Materials

This hospital-based observational study was conducted at the Department of Medicine and the Department of Hepatology at Bangabandhu Sheikh Mujib Medical University (BSMMU) and Dhaka Medical College Hospital (DMCH), Dhaka, Bangladesh between June 2012 and September 2012. The study focused on adult patients diagnosed with Hepatitis B Virus (HBV) infection who were admitted to these departments during the study period. A total of 100 consecutive cases were included using a non-randomized purposive sampling method.

Inclusion Criteria:

- Patients serologically positive for Hepatitis B surface antigen (HBsAg).
- Age above 18 years.
- Patients or legally accepted guardians who provided informed consent and were willing to comply with study procedures.

Exclusion Criteria:

- Patients below 18 years of age.
- Patients or their attendants unwilling to participate in the study.

Patients admitted with features suggestive of hepatitis were initially evaluated by attending physicians and those suspected of having HBV infection were referred to the study physician for further assessment. A detailed clinical history and relevant physical examination focusing on hepatobiliary symptoms were conducted and patients meeting the inclusion criteria were enrolled. Structured interviews were carried out using a pre-designed case record form and written informed consent was obtained before collecting immediate blood samples for serological testing of HBsAg to confirm HBV infection. Participants were categorized based on educational background into five groups: illiterate (less than class five education), primary education (class V and above), secondary education (class X and above), higher secondary education (class XII and above) and graduate level (honors or master's). Socioeconomic status was classified into three categories according to monthly income: low (<10,000 BDT), middle (10,000–50,000 BDT) and high (>50,000 BDT). Additionally, potential sources of HBV transmission were explored. Data were entered and analyzed using SPSS Statistics Version 17.0, with continuous variables summarized as means and standard deviations and categorical variables presented as counts and percentages. Ethical approval was obtained from the Ethical Review Committee of BSMMU, ensuring that participants were informed about the study, their confidentiality was maintained and they had the right to withdraw at any time.

III. Results

Table 1: Demographic Characteristics of Patients with Hepatitis B Virus Infection (n=100)

Variable	Frequency (n)	Percentage (%)	
Age (In Years)	18-27	28	28.0%
	28-37	25	25.0%
	38-47	23	23.0%

	48-57	12	12.0%
	58-67	7	7.0%
	68-77	5	5.0%
Gender Distribution	Male	72	72.0%
	Female	28	28.0%
Marital Status	Married	55	55.0%
	Unmarried	40	40.0%
	Widow	5	5.0%

Table 1 presents the demographic characteristics of the study population, including age, gender and marital status. The mean age of patients is 35.34 years. The majority of cases fall within the 18-47 years age group (76%), with the highest incidence in the 18-27 years group (28%). Males (72%) are more affected than females (28%). In terms of marital status, married individuals (55%) constitute the largest group, followed by unmarried (40%) and widowed individuals (5%).

Table 2: Occupational Distribution of Patients with Hepatitis B Virus Infection (n=100)

Occupation	Frequency (n)	Percentage (%)
Farmer	20	20.0%
Businessman	10	10.0%
Service holder	8	8.0%
Teacher	8	8.0%
Housewife	10	10.0%
Driver/Rickshaw puller	6	6.0%
Student	12	12.0%
Unemployed	12	12.0%
Coming from abroad	6	6.0%
Health Worker	8	8.0%

Table 2 highlights the occupational background of patients with hepatitis B virus infection. Farmers represent the largest affected group (20%), followed by students (12%) and unemployed individuals (12%). Businessmen (10%), housewives (10%) and health workers (8%) also make up a significant portion. The presence of cases among service holders (8%) and teachers (8%) indicates potential occupational exposure risks.

Table 3: Socioeconomic and Educational Background of Patients with Hepatitis B Virus Infection

Variable	Frequency (n)	Percentage (%)	
Educational Background	Illiterate	35	35.0%
	Primary	30	30.0%
	Secondary	20	20.0%
	Higher Secondary	10	10.0%
	Graduate	5	5.0%
Socioeconomic Condition	Low Socioeconomic	59	59.0%
	Middle Socioeconomic	36	36.0%
	High Socioeconomic	5	5.0%
Area Distribution	Rural	66	66.0%
	Urban	34	34.0%

Table 3 examines the socioeconomic and educational distribution of the patients. The highest proportion of cases is seen among illiterate individuals (35%), followed by those with primary (30%) and secondary education (20%). Socioeconomic analysis shows that a majority of patients belong to the low-income group (59%), while only 5% come from a high socioeconomic background. Additionally, rural residents (66%) are more affected than urban dwellers (34%), highlighting geographical disparities in infection prevalence.

IV. Discussion

This study examines the socioeconomic and occupational factors influencing Hepatitis B Virus (HBV) infection in a hospital-based population in Bangladesh. HBV remains a major public health concern globally, particularly in low- and middle-income countries like Bangladesh, where it contributes to a significant burden of liver disease. The findings reveal a strong association between HBV infection and factors such as lower socioeconomic status, limited education and high-risk occupations, such as farming. These results emphasize the complex interplay between socioeconomic and occupational determinants in the prevalence of HBV infection and underscore the need for targeted public health interventions to mitigate the spread of the virus in high-risk groups.

In this study, the mean age of patients is 35.34 years, with the majority of cases falling within the 18-47 years age group (76%). The highest incidence is seen in the 18-27 years group (28%). These findings align with those of Mohammed et al.[10], where the mean age of study adults was 34.24 years, indicating a similar prevalence in the adult population. Additionally, U.S. data from 2021 reported that newly diagnosed chronic

hepatitis B cases were most frequent among individuals aged 30-39 and 40-49 years, accounting for 48% of cases,[11] which is comparable to the age distribution in this study. Regarding gender, males are more affected (72%) than females (28%), which corresponds with U.S. data from 2015-2018, showing a higher prevalence of hepatitis B in men (5.3%) compared to women (3.4%).[12] This further supports the observation that hepatitis B disproportionately impacts adult males, particularly in the middle-aged group.

In this study, the occupational distribution of patients with hepatitis B virus infection shows that farmers (20%) represent the largest affected group, followed by students (12%) and unemployed individuals (12%). Other affected groups include businessmen (10%), housewives (10%) and health workers (8%). These findings are in line with studies by Kumar et al.[13], who reported that a significant portion of their study population worked as laborers (47.3%), with others in skilled employment (10.9%), highlighting the prevalence of hepatitis B infection in occupations involving manual or skilled labor. Additionally, Tolera et al.'s[14] study, which focused on sanitary workers, found a higher prevalence of hepatitis B among those in occupations with higher exposure to environmental risks, such as sewage and waste treatment workers, where direct contact with sewage—a known medium for HBV transmission—resulted in a seroprevalence of 47.66%. Similarly, the significant proportion of patients in this study who are farmers and health workers may point to specific occupational exposures that increase the risk of HBV infection.

In this study, the educational background of patients with Hepatitis B Virus (HBV) infection reveals a clear trend of higher prevalence among those with lower levels of education. A majority of the patients (35%) are illiterate, followed by 30% with only primary education and 20% with secondary education, while only 5% have attained higher education. These findings are consistent with those of Yang et al.[15], who observed that a large portion of participants (44.25%) had primary school education or less and this group demonstrated the highest prevalence of HBV infection. Furthermore, Yang et al. found that individuals with higher education (only 6.5%) had the lowest HBV prevalence, suggesting that education level may play a crucial role in awareness and prevention. The socioeconomic condition of the study population also reflects a significant association with HBV infection, with 59% of patients belonging to low socioeconomic backgrounds. This mirrors the results from Wang et al.[16], who demonstrated that lower socioeconomic status is consistently linked to higher rates of HBV infection. Their study on pregnant women in China from 2013 to 2020 found that individuals in lower economic groups had a notably higher prevalence of HBV, highlighting the impact of economic disparities on infection rates. Additionally, Okui et al.[17] emphasized that individuals from higher socioeconomic strata are more likely to seek early screenings and treatments due to greater awareness, which likely reduces HBV prevalence in this group. Geographically, the study found that 66% of patients reside in rural areas, a critical factor since rural populations often face barriers such as limited access to healthcare and fewer awareness programs. Akcam et al.[18] similarly reported higher HBV infection rates in rural areas (8.2%) compared to urban areas (6.2%), identifying economic constraints, higher rates of injection use and family history as contributing risk factors. Furthermore, this study reveals that farmers are more affected than other professions, comprising 20% of cases. Several factors may underlie this trend, including the predominance of farmers in rural areas, poor socioeconomic conditions, lack of medical knowledge, inadequate screening programs, insufficient vaccination coverage and unidentified etiological factors. These results emphasize the need for targeted health interventions that address these social determinants of health, particularly in rural and economically disadvantaged populations, to effectively reduce HBV infection rates.

Limitations of the study

This study had some limitations:

- This is a hospital-based observational study, which may not represent the overall scenario of the community or the country.
- A larger-scale study is needed to explore other potential underlying etiologies comprehensively.

V. Conclusion

This study demonstrates that HBV infection disproportionately affects young working-age males, rural populations and low-income groups, with farmers and health workers facing significant occupational risks. The strong association with low education (65% with \leq primary education) and socioeconomic status (59% low-income) underscores systemic healthcare disparities. These findings highlight the urgent need for targeted interventions—including workplace vaccination programs, rural health initiatives and poverty-alleviation strategies—to address the socioeconomic and occupational determinants of HBV transmission.

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