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Original Article

Seroprevalence of Anti-HAV IgG in Chronic Hepatitis-B Patients

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Abstract

Background: *Hepatitis A virus (HAV) typically causes self-limiting acute hepatitis. However, in individuals with chronic hepatitis B virus infection, HAV superinfection can lead to severe, life-threatening liver complications. Identifying hepatitis B carriers immune to HAV is therefore vital for clinical management and preventive healthcare strategies.*

Objective: *To determine the seroprevalence of anti-HAV IgG in chronic hepatitis B patients.*

Methods: *This observational cross-sectional study was conducted in the Department of Medicine, Comilla Medical College Hospital, from January to June 2021. Using purposive sampling, 84 chronic hepatitis B patients were enrolled. Data were collected via a structured questionnaire, and anti-HAV IgG status was determined using a competitive ELISA technique. Statistical analysis was performed with SPSS.*

Results: *Among 90 chronic hepatitis B patients (75 male, 15 female), the overall anti-HAV IgG seroprevalence was 72.2% (65/90), with no significant gender disparity. Contrary to established patterns, the highest prevalence was observed in the youngest age group. Seropositivity was also higher among individuals with illiteracy and those from lower socioeconomic backgrounds.*

Conclusion: *As no age group is fully immune to HAV and HAV superinfection in Chronic Hepatitis B patients can lead to fulminant hepatic failure, so every patient with Chronic Hepatitis B should be screened for HAV, and immunization should be done against HAV, if not already immunized.*

Keywords: *Anti-HAV IgG, Chronic hepatitis B, Coinfection, Seroprevalence, Socioeconomic Factors, Vaccination.*

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Introduction

Hepatitis, an inflammation of the liver, represents a significant global health burden, with viral etiologies being the most common cause.[1] Among these, the hepatitis A virus (HAV) and hepatitis B virus (HBV) present distinct clinical and epidemiological profiles. HAV is typically a self-limiting, acute infection transmitted via the fecal-oral route, often in areas with poor sanitation.[2] In contrast, HBV is a blood-borne pathogen that can lead to a chronic carrier state, predisposing individuals to severe long-term sequelae such as cirrhosis, hepatic decompensation, and hepatocellular carcinoma.[3] While HAV infection in otherwise healthy individuals usually resolves spontaneously, its clinical course can be dramatically altered in patients with pre-existing chronic liver disease.[4,5] Superinfection with HAV in individuals chronically infected with HBV is a well-recognized clinical entity associated with a heightened risk of fulminant hepatic failure (FHF) and significant mortality.[6,7] The concomitant viral assault can overwhelm the hepatic regenerative capacity, leading to a more severe clinical presentation than either infection alone.[87] This interaction underscores a critical public health imperative: the identification and protection of vulnerable populations. A highly effective and safe vaccine against HAV is available,

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making the prevention of this dangerous superinfection a feasible goal.[9] Consequently, leading health authorities, including the Advisory Committee on Immunization Practices (ACIP), recommend HAV vaccination for all patients with chronic liver disease, including those with chronic HBV infection.[10] The rationale is to prevent an acute, vaccine-preventable illness from triggering life-threatening complications in an already compromised liver. The foundation for such a targeted vaccination strategy is an accurate understanding of the local seroepidemiology of HAV. Seroprevalence, indicated by the presence of anti-HAV IgG antibodies, reflects past infection or vaccination and signifies lifelong immunity.[11] The global epidemiology of HAV is shifting; improvements in sanitation and hygiene in many developing countries are leading to a decrease in childhood exposure, resulting in a growing population of susceptible adults—a phenomenon known as epidemiological transition.[12,13] This makes age-stratified seroprevalence data increasingly important. Therefore, determining the proportion of chronic HBV patients who are susceptible to HAV is essential for informing cost-effective vaccination policies. This study was designed to investigate the seroprevalence of anti-HAV IgG and its associated socio-demographic factors among chronic hepatitis B patients in a tertiary care setting in Bangladesh, providing crucial data to guide local preventive healthcare strategies.

Methodology

Study population

This observational, cross-sectional study was conducted in the Department of Medicine at Comilla Medical College Hospital from January 1st to June 30th, 2021. The study population consisted of all known chronic hepatitis B (HBsAg-positive) patients attending the medicine department within these six months.

Inclusion criteria

Participants were enrolled based on the following criteria: they were known cases of chronic hepatitis B, were above 12 years of age, irrespective of gender, and provided informed consent to take part in the study.

Exclusion criteria

Individuals were excluded from the study if they were below 12 years of age, had a history of previous hepatitis A vaccination, or declined to participate.

Study procedure

A purposive sampling method was used. Using Cochran's formula with a 95% confidence level and 5% margin of error, a minimum sample size of 84 was calculated. Data were collected using a pre-tested, structured questionnaire. Venous blood was drawn from each participant, and serum was tested for anti-HAV IgG using a competitive enzyme-linked immunosorbent assay (ELISA).

Data analysis

Data were analyzed using latest version of SPSS software. Quantitative data were presented as means and standard deviation, while qualitative data were expressed as frequencies and percentages. A p-value of less than 0.05 was considered statistically significant.

Result

The study analyzed 90 chronic hepatitis B patients with a mean age of 45.88 years (±15.22). The overall seroprevalence of anti-HAV IgG was 72%. The cohort was predominantly male, with a male-to-female ratio of 5:1. Seropositivity was similar between genders, with 73.33% of males and 66.67% of females testing positive. Analysis by age revealed a distinct pattern. The highest seroprevalence (100%) was found in the 21-30 years age group, while the lowest (50%) was observed in the 41-50 years age group. Significant associations were identified with socioeconomic and occupational factors. Seroprevalence was highest among illiterate participants (92.68%) and day laborers (100%). A higher prevalence was noted in rural residents (75.38%) compared to urban residents (64%), though this difference was not statistically significant. The majority of the study population belonged to the lower-middle socioeconomic class. Clinically, a substantial number of patients (n=41) presented with decompensated cirrhosis, and among this subgroup, 36.58% were seropositive for anti-HAV IgG.

Table I

Age group distribution of the study population (n=90)

Age (Years)	Frequency	Anti-HAV IgG +ve	Percentage
13-20	5	4	80
21-30	15	15	100
31-40	20	15	75
41-50	10	5	50
51-60	25	16	64
>60	15	10	66.66

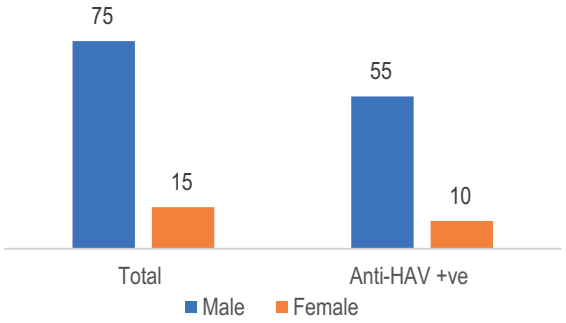

Figure 1: *Sex distribution of the study population (n=90)*

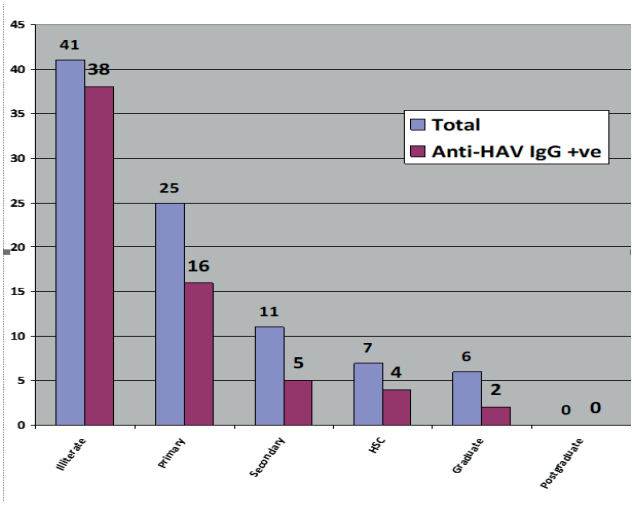

Figure 2: *Educational background of study population*

Table II

Occupation of the study population (n=90)

Occupation	Number	HAV IgG +ve	Percentage
Service	7	3	42.85
Business	6	4	66.67
Farmer	30	26	86.67
Student	3	1	33.33
Housewife	14	9	64.28
Unemployed	15	10	66.67
Day laborer	11	11	100
Others	4	1	25

Table III

Residential area of study population

Area	Number	HAV IgG positive	Percentage
Urban	25	16	64
Rural	65	49	75.38

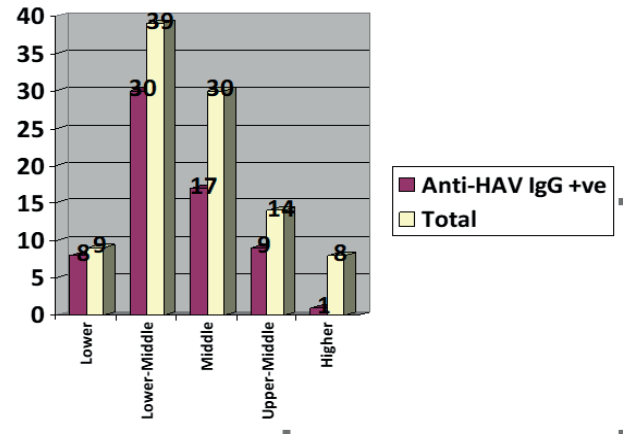

Figure 3: *Economic background of study population*

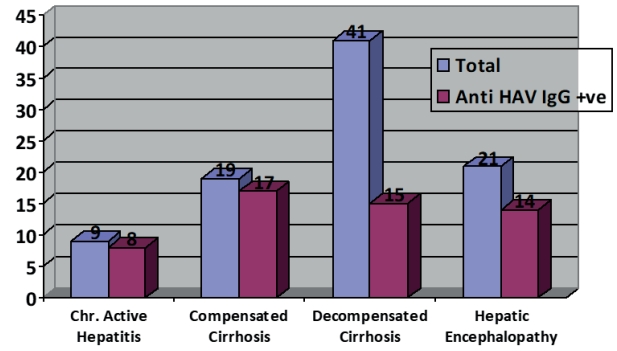

Figure 4: *Clinical presentation of study population*

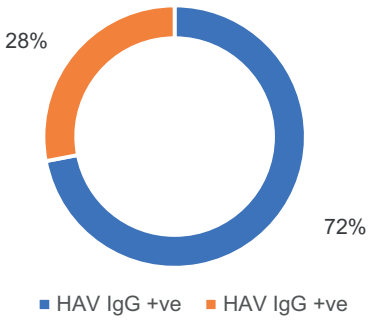

Figure 5: *Seroprevalence of HAV IgG*

Discussion

This study provides critical insights into the sero-epidemiology of hepatitis A virus (HAV) among chronic hepatitis B (HBV) patients in Bangladesh. The finding of a 72% overall seroprevalence of anti-HAV IgG indicates that a substantial portion (28%) of this high-risk group remains susceptible to HAV superinfection. This susceptibility is clinically significant, as HAV superinfection in chronic HBV carriers is a well-established risk factor for fulminant hepatic failure.[6,7] The identified susceptible cohort represents a

prime target for a cost-effective vaccination strategy to prevent severe liver injury. The demographic profile of our study population, with a male predominance (5:1 ratio), is consistent with the epidemiology of chronic HBV in many regions.[14] The similar seropositivity rates between males and females suggest that gender is not a determining factor for HAV exposure in this specific clinical context. The most striking finding of our study pertains to the atypical age-related seroprevalence pattern. Contrary to the typical epidemiological pattern in endemic regions, where seroprevalence increases steadily with age due to cumulative exposure,[12,13] we observed the highest prevalence (100%) in the 21–30-year age group and the lowest (50%) in the 41–50-year group. This anomaly may reflect shifting epidemiological forces in Bangladesh, including variations in sanitation and living conditions during different periods of their lives, leading to unexpected cohorts of susceptibility in middle-aged adults.[15] This underscores the danger of relying on regional or historical data and highlights the need for local, current seroprevalence studies to guide policy. Our results strongly affirm the influence of socioeconomic status on HAV exposure. The significantly higher seroprevalence among illiterate participants (92.68%) and specific occupational groups like day laborers (100%) aligns with the known fecal-oral route of HAV transmission.[2] These groups often face overcrowded living conditions and limited access to clean water and sanitation, facilitating virus circulation.[16] The higher, though not statistically significant, seroprevalence in rural areas (75.38%) compared to urban settings (64%) further supports this, pointing to the ongoing role of socioeconomic development in modulating hepatitis A epidemiology.[13] A concerning finding was that over 45 patients presented with decompensated cirrhosis, and over a third of this vulnerable subgroup were susceptible to HAV. For these patients, an acute HAV superinfection could be catastrophic, potentially accelerating liver failure and mortality.[8,17] This underscores the critical importance of integrating HAV serological screening into the routine management of all chronic liver disease patients, including those already showing signs of decompensation. The primary limitation of this study is its single-center design and purposive sampling method, which may limit the generalizability of the findings to the entire national population. A larger, multi-center study would be valuable to confirm these trends. Furthermore, the cross-sectional nature of the study can establish an association but not causation between the socioeconomic factors and HAV seropositivity.

Limitations:

This study has limitations, including a small sample size too limited to draw definitive conclusions on this prevalent issue. The single-center design restricts its generalizability, and the short study duration may not fully capture the epidemiological picture. Future multi-center, longitudinal studies are recommended.

Conclusion

This study revealed a 72% seroprevalence of past HAV infection among chronic hepatitis B patients, leaving a significant 28% susceptible to the risk of severe HAV superinfection. Seropositivity was significantly associated with lower education levels and certain occupations. Crucially, no predictable pattern was found across age groups. Therefore, universal vaccination against HAV is strongly recommended for all chronic hepatitis B patients, irrespective of age or residence, as serological status cannot be reliably inferred from demographics alone.

Recommendation:

This may not reflect the exact situation of the disease in the community. Proximity to reality cannot be underestimated. A large-scale, multi-center study should be undertaken.

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