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Original Research Article

HEPATITIS B – ITS CLINICO-DEMOGRAPHIC PROFILE AND MODES OF TRANSMISSION

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ABSTRACT

Background: Hepatitis B virus (HBV) poses a serious global health burden, particularly in regions where it is highly prevalent. Its clinical impact ranges from completely silent infections to severe complications like liver failure. Chronic infection can eventually lead to cirrhosis or liver cancer. This study aimed to assess the clinical features, demographic characteristics, and laboratory findings of patients testing positive for Hepatitis B surface antigen (HBsAg), while also identifying potential transmission pathways.

Materials and Methods: A one-year observational study was conducted at a tertiary care hospital in Assam. Sixty patients aged 13 and above, all confirmed HBsAg-positive, participated after giving informed consent. Their medical history, symptoms, and risk factors were recorded along with clinical evaluations.

Results: Among the 60 hepatitis b positive patients, majority (36.67 %) patients belonged to the 21– 30 years age group, (71.67%) were male, while 17 (28.33%) were female, 44 (73.33%) were married, labour class (30.00%), belongs to upper lower socioeconomic class (36.67%), completed high school education (38.33%).Most of them were asymptomatic (55.00%) followed by fatigue, loss of appetite, jaundice, fever, abdominal discomfort being the most common symptoms. Known risk factors included alcohol consumption (28.33%), previous history of surgical intervention (11.67%), and blood transfusions (8.33%), although in 40% of cases, the route of transmission remained unidentified.

Conclusion: Young adult males are disproportionately affected by Hepatitis B. A significant proportion of HBsAg-positive individuals remain asymptomatic and here lies the importance of routine screening. The unknown sources of transmission highlight the need for strengthened public health efforts in prevention, awareness, and early diagnosis.

Keywords: HBV, DNA, HIV.

INTRODUCTION

Hepatitis B virus (HBV) as the second leading carcinogen after tobacco according to world health organization(WHO) guidelines.[1] As a DNA virus belonging to the Hepadnaviridae family, HBV is capable of causing both sudden and long-term liver issues. Globally, around 2 billion people have been exposed to the virus, and by 2022, about 396 million were living with chronic HBV, with 1.2 million new cases emerging annually.[2] Of these, approximately 10% reside in sub-Saharan Africa and the Asian subcontinent. In India, Hepatitis B surface antigen (HBsAg) prevalence is estimated to be between 3% and 4.2%, with more than 40 million people identified as HBV carriers.[3]

The clinical presentation of acute Hepatitis B infection typically follows three phases: prodromal, icteric, and recovery.[4] After an incubation period that varies depending on the virus type, patients may

initially experience symptoms such as chills, nausea, headache, and vomiting. These often appear before jaundice becomes evident.[5] The liver may become enlarged and tender, often accompanied by pain in the right upper quadrant. Additionally, splenomegaly and lymph node enlargement occur in approximately 10% to 20% of cases.[6] Most HBV cases generally resolve with complete clinical and biochemical recovery. However, some individuals may develop chronic infections, which can eventually progress to liver cirrhosis or hepatocellular carcinoma.[7]

HBV has been detected in nearly all body secretions and excretions. However, transmission primarily occurs through blood, blood-contaminated body fluids, semen, and vaginal secretions.[8] The main modes of HBV transmission include sexual contact with an infected individual, close household contact, perinatal transmission from mother to infant, intra venous drug use, and exposure in healthcare settings.[9]

Parenteral routes that contribute to HBV transmission include transfusion of blood or blood products that are not screened, unsterilized needles sharing intravenous drug, undergoing procedure like hemodialysis, getting acupuncture or tattoos with contaminated tools being injured by infected sharp instruments, especially in healthcare settings.[10,11]

MATERIALS AND METHODS

This was a hospital-based, cross-sectional study conducted over one year in the Department of Medicine at Assam Medical College and Hospital. The research involved 60 patients who had tested positive for Hepatitis B surface antigen (HBsAg). Participants were selected based on specific criteria: they had to be at least 13 years old, HBsAg-positive, and willing to provide informed consent.

Exclusion Criteria

Patients were excluded if they had co-infections with Hepatitis C or HIV, or if they were pregnant and HBsAg-positive.

Scheme of Study: Informed Consent: Each participant (or legal guardian) received a detailed explanation of the study, and written consent was obtained.

Ethical Approval: The Institutional Ethics Committee (Human) approved the study before it began.

Enrollment: After confirming HBsAg status, enrolled participants were interviewed using a structured form.

Data Collection: The interview captured demographic details, symptoms, and possible routes of transmission. Each participant underwent a thorough physical examination. Privacy and confidentiality were ensured throughout.

Analysis: The compiled data were analyzed using appropriate statistical methods to address the study's aims and objectives.

Data collection method: Participants after giving consent underwent a face-to-face interview, which included pre-test counseling. Subsequently, patients demographic, clinical, and possible modes of transmission were recorded utilizing a standardized form. Patient confidentiality and privacy were strictly maintained throughout the data gathering phase. Comprehensive medical history were documented, alongside any related systemic disorders, using standardized case record forms. Hospital registration numbers were noted.

Statistical analysis: Data collected were analyzed using descriptive statistics such as mean, median, standard deviation, and percentages. The Chi-square test was applied for group comparisons. A p-value of <0.05 was considered statistically significant.

RESULTS

1. Analysis with age wise distribution showed the majority of patients were in the 21–30 age bracket (36.67%), followed by the 31–40 age group (25%). The youngest participant was 17, and the oldest was 72, with a mean age of 36.05 ± 13.41 years.

Table 1: Age wise distribution

Age Group (In Years)	Number (n)	Percentage (%)
13-20	5	8.33
21-30	22	36.67
31-40	15	25.00
41-50	6	10.00
51-60	10	16.67
>60	2	3.33
Total	60	100.00
Mean + S.D	36.05 + 13.41	

2. Out of 60 patients, 43 (71.67%) were male and 17 (28.33%) were female. This results in a male-to-female ratio of approximately 2.5:1.

Table 2: Gender wise distribution

Gender (In Years)	Number (n)	Percentage (%)
Male	43	71.67
Female	17	28.33
Total	60	100.00
Ratio (M;F)	2.53:1	

It was seen that out of 60 patients, 44 (73.33%) were married and 16(26.67%) were unmarried.

3. Analysis of the patients on the basis of education showed that 1.67 % (n=1) of patients are illiterate, while 28.33%(n=17) have completed primary education. Followed by 38.33 %(n=23) have completed High school education,25% have finished higher secondary education, and 6.67% have pursued graduate degree.

Table 3: Showing educational status

Educational Status	Number (n)	Percentage (%)
Illiterate	1	1.67
Primary School	17	28.33
High School	23	38.33
Higher Secondary	15	25.00
Graduate	4	6.67
Postgraduate	0	0.00
TOTAL	60	100.00

4.Occupational Distribution: Laborers formed the largest group (30%), followed by the unemployed (23.33%). Housewives (18.33%), skilled workers (16.67%), students (10%), and healthcare workers (1.67%) were also represented.

Table 4: Showing occupation of the study subjects

Occupation	Number (n)	Percentage (%)
Labour	18	30.00
Unemployed	14	23.33
House Wife	11	18.33
Skilled Employment	10	16.67
Student	6	10.00
Health Care Workers	1	1.67
Total	60	100.00

5. Socioeconomic Class: Based on standard classification, 36.67% belonged to the upper-lower class, 31.67% to the lower-middle class, and 16.67% to the lower class. A smaller percentage (15%) came from the upper-middle class. No participants belonged to the highest socioeconomic tier.

6. Symptoms: Analysis of patients on the basis of symptoms, it reveals that 55.00%(n=33)were asymptomatic and among those who experienced symptoms, the most frequent presentation were fatigue (21.67%)(n=13) and loss of appetite (21.67%)(n=13), followed by jaundice (18.33%)(n=11) and fever (15.00%)(n=9), abdominal discomfort (11.67%)(n=7), abdominal distension (11.67%)(n=7), high coloured urine (8.33%)(n=7), joint pain (6.67%)(n=4), itching (6.67%)(n=4), and altered sensorium (5.00%)(n=3). Less commonly reported symptoms were vomiting blood (3.33%) (n=2), black tarry stool (3.33%)(n=2), diarrhea (1.67%)(n=1), and nausea (1.67%)(n=1).

Table 5: Showing symptoms of hepatitis b in the study subjects

Symptoms	Number (n)	Percentage (%)
Abdominal Discomfort	7	11.67
Abdominal Distension	7	11.67
Nausea	1	1.67
Vomiting – Blood	2	3.33
Black tarry Stool	2	3.33
Jaundice	11	18.33
Diarrhoea	1	1.67
Convulsion	0	0.00
Altered Sensorium	3	5.00
Fever	9	15.00
Fatigue	13	21.67
Loss of Appetite	13	21.67
Joint pain	4	6.67
Itching	4	6.67
Rashes	0	0.00
Dark Urine	5	8.33
Asymptomatic	33	55.00

7. Clinical Signs: On analysis of the Clinical Signs, it reveals that out of 60 patients, 50% (n=30) patients showed no detectable physical signs relevant to Viral hepatitis manifestations. Among those presenting with clinical signs, 20.00%(n=12) showed icterus, followed by ascites 11.67%(n=7), pallor 10.00%(n=6), splenomegaly 6.67%(n=4), flapping tremor 6.67%(n=4), lower limb edema 6.67%(n=4), hepatomegaly 5.00%(n=3), and scratch marks 3.33%(n=2).

Table 6: Showing clinical signs of hepatitis b in the study subjects

Sign	Number (n)	Percentage (%)
Splenomegaly	4	6.67
Scratch Mark	2	3.33
Ascites	7	11.67
Flapping Tremor	4	6.67
Lower Limb Oedema	4	6.67
Pallor	6	10.00
Hepatomegaly	3	5.00
Icterus	12	20.00
No Clinical Sign	30	50.00

8. Risk Factors: Analysis of risk factors among 60 patients, it was seen that in most of the cases 40%(n=24), potential source of infection was unknown. Among the known risk factors, alcohol consumption 28.33%(17) was most frequently reported, followed by a history of previous surgery 11.67%(n=7) and blood transfusion 8.33%(n=5). Other significant risk factors included illicit drug use 8.33%(n=5), close contact with an infected individual 8.33%(n=5), tattooing 6.67%(n=4), hemodialysis 6.67%(n=4), dental procedure 3.33%(n=2), unprotected sexual exposure 3.33%(n=2), healthcare-related risks 1.67%(n=1), body piercing and acupuncture 1.67%(n=1).

Table 7: Showing risk factors of hepatitis b in the study subjects

Risk Factor	Number n)	Percentage (%)
H/o Blood Transfusion	5	8.33
H/o Previous Surgery	7	11.67
H/o Unprotected Sexual Exposures	2	3.33
Following dental procedure	2	3.33
Unknown Source	24	40.00
Illicit Drug Users	5	8.33
Tattooing	4	6.67
Close Contact with Infected Persons	5	8.33
Health Worker/Medical Staff	1	1.67
Others (body piercing acupuncture, sharing personal equipment)	1	1.67
H/o Alcohol Intake	17	28.33
Hemodialysis	4	6.67

DISCUSSION

Our findings show that young adult males, particularly those in their 20s and 30s, are most commonly affected. The most common age group (36.67%) was aged 21- 30 years, with the 31- 40year group being the next most common (25%). This mirrors other studies like in Xiaohong Chen and colleagues determined the median age for acute hepatitis B patients to be 36.03 years, observing the peak incidence rate within the 20-29 year age group (31.07%).[12] Also Liu et al. in their study observed a male predominance in hepatitis B cases.[13]

It reflects a combination of factors like greater social mobility, occupational exposure, and lower health-seeking behaviour in this age group.

A large number of patients come from lower socioeconomic backgrounds and had limited formal education, which is an important concern. Likewise , Bhattacharya et al. found that most of the hepatitis B patients belonged to lower and lower middle socioeconomic classes.[14]

The highest proportion of patients (38.33%, n=23) had finished high school, followed by 25% (n=15) who completed higher secondary education. Similarly, Sharma et al. in their study observed that a majority of hepatitis B patients had only primary or high school education.5 Liu et al. reported that hepatitis B patients with higher education were more likely to seek timely medical intervention and vaccination, reducing disease transmission.[13]

Which showed that Limited awareness about the disease, its transmission, and prevention—especially vaccination—may be contributing to the spread of Hepatitis B in these communities.

In our study most of the affected individuals were laborers or unemployed, which further emphasizes the role of economic and social vulnerabilities in increasing the risk of infection. Similarly, according to Xiaohong Chen et al., occupational groups such as workers and farmers constituted high-risk categories for acute hepatitis B, representing 33.33% and 27.12% of their patient cohort, respectively.[15]

In our study more than half of the patients (55%) had no symptoms at diagnosis. Among those who did, common complaints were fatigue, loss of appetite, and jaundice. In terms of clinical signs, icterus and ascites were noted in some patients, but many did not show any noticeable physical signs. Similarly, Sharma et al. who observed that approximately 50% of hepatitis B patients were asymptomatic.[16] Also in Liu et al. study showed that icterus and hepatomegaly were among the most common clinical signs in symptomatic patients, while a considerable proportion remained asymptomatic.[13]

This silent nature of the infection makes routine screening even more important, especially in high-risk populations.

In our study, the majority of cases (40.00%, n=24), the potential source of infection was unknown. Among identified risk factors, alcohol consumption was the most frequently reported (28.33%, n=17), followed by a history of previous surgery (11.67%, n=7). Similarly, Sharma et al. found that a significant proportion of hepatitis B cases had no identifiable risk factors, while alcohol consumption and previous surgical history were among the commence contributors.[5]

This highlights the likelihood of unnoticed or community-level transmission. Among known risk factors, blood transfusions. tattooing, drug use, or close contact with infected individuals stood out.

Overall, the study shows that Hepatitis B is silently affecting young people, especially men from low-income groups, many are unaware they even have the infection. This reinforces the urgent need for more awareness campaigns, wider vaccine coverage, and regular screening programs, especially in underserved areas. By addressing these gaps, we can take meaningful steps toward controlling the spread of this preventable disease in order Institution and other Medical technologies.

Clinical Implications: - The findings of our study have important clinical implications. By identifying the most common routes of transmission—such as illicit drug use, unsafe injections, and unprotected sexual contact—we can better target public health efforts toward prevention. The demographic patterns observed, including age and gender trends, help in recognizing high-risk groups who would benefit from focused screening and early intervention. These insights also support the need for routine screening of family members and close contacts, especially in cases of household or vertical transmission.

CONCLUSION

The study identifies young males from upper lower socioeconomic backgrounds as a vulnerable population for HBV infection. Since a significant number of cases are asymptomatic, regular screening is vital. Strengthening vaccination programs, enhancing community awareness, and ensuring safe medical practices can play a pivotal role in reducing HBV transmission.

Limitation: The study was limited by a small sample size, highlighting the need for further research involving larger populations to improve the generalizability of the findings. Additionally, the short duration of follow-up underscores the importance of long-term studies to monitor potential complications such as cirrhosis and hepatocellular carcinoma. Since this was a hospital-based study, there is a need for community-level surveys and large-scale screening programs to better assess the true burden of disease in the general population.

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