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Original Research Article

Prevalence of Hepatitis B Infection Among the Patients Attending the Tertiary Care Hospital – A Retrospective Observational Study

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Abstract:

Background: Hepatitis B virus (HBV) infection remains an important public health problem because of its potential to cause chronic hepatitis, cirrhosis, and hepatocellular carcinoma. Hospital-based screening helps in identifying the burden of infection and guiding preventive strategies. **Aim:** To determine the prevalence of HBV infection among patients attending a tertiary care hospital.

Methods: This retrospective observational study was conducted in the department of Microbiology, Government Medical College, Rajamahendravaram, from April 2023 to March 2024. Laboratory records of patients screened for HBV were reviewed. A total of 6,712 individuals were included, comprising 2,613 male, 1,708 non-antenatal female, and 2,391 antenatal female. Known hepatitis B-positive cases were excluded. Data were analyzed using frequencies, percentages, and chi-square test.

Results: Overall, 211 of 6,712 screened individuals were positive, giving an HBV prevalence of 3.14%. Among males, positivity was 4.36%; among non-antenatal females, 4.57%; and among antenatal females, 0.79%. Age-wise variation was significant among males and the non-antenatal population, whereas it was not significant among antenatal women. HBV positivity was significantly lower in antenatal women compared with the non-antenatal population.

Conclusion: Although HBV prevalence was relatively low, continued screening, vaccination, and health education are essential, particularly in antenatal women, to reduce transmission and disease burden.

Keywords: Hepatitis B Virus, Seroprevalence, Antenatal Women, Hospital-Based Study, Screening.
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Introduction

Hepatitis B virus (HBV) infection remains a major global public health problem and continues to contribute substantially to chronic hepatitis, cirrhosis, and hepatocellular carcinoma. Recent estimates indicate that hundreds of millions of people are living with chronic HBV infection worldwide, while diagnosis and treatment coverage remain inadequate, especially in low- and middle-income countries [1]. In India, HBV continues to pose an important epidemiological and clinical burden, with community-based data showing that a large proportion of adults still remain susceptible to infection, highlighting the need for strengthened screening and prevention strategies [2]. HBV is transmitted through blood, sexual contact, and perinatal exposure, and infection may remain asymptomatic for long periods before progressing to advanced liver disease. Early diagnosis through HBsAg screening is therefore essential, particularly among hospital attendees and pregnant women, as updated guidance strongly supports universal antenatal screening and timely prophylaxis to prevent mother-to-child transmission [3]. The study was undertaken to determine the prevalence of HBV infection among patients attending this tertiary care hospital.

Methods

This retrospective observational study was conducted in the department of Microbiology, Government Medical College, Rajamahendravaram, over a period of one year from April 2023 to March 2024. Being a record-based prevalence study, the methodology was designed to include all patients who underwent screening for Hepatitis B during the defined study period. The study population comprised patients attending the outpatient, inpatient departments, and antenatal clinics of various specialties in the hospital. All patients who underwent HBV screening during the study period were considered eligible for inclusion. Patients who were already known to be Hepatitis B positive prior

to the study period were excluded, so that only freshly screened cases contributing to the hospital prevalence during the specified period were analyzed.

The required information was obtained from the laboratory records maintained in the department of Microbiology. These records included the details of all serum samples received for Hepatitis B screening from different hospital departments and antenatal clinics. Relevant variables such as patient category, source of referral, and screening results were extracted from the registers and entered into a structured data collection format. As this was a retrospective study, no direct contact with patients, repeat sampling, or clinical intervention was involved. The laboratory records were reviewed carefully to avoid duplication and to ensure completeness of information. The aim of using a retrospective design was to assess the burden of HBV infection in a large hospital-based population using already available diagnostic data, thereby providing useful epidemiological information about the prevalence of infection in this region. The hospital setting, which caters to a wide range of patients including pregnant women, also allowed the study to capture HBV screening patterns across different clinical groups.

The collected data were compiled systematically and analyzed to estimate the prevalence of HBV infection among the screened patients. Since the principal objective of the study was to determine prevalence, the analysis was mainly descriptive in nature. The total number of screened individuals and the number of positive cases were used to calculate the proportion of HBV infection in the study population. The findings were expressed in terms of frequencies and percentages. Wherever required, subgroup distribution such as outpatient, inpatient, and antenatal cases could also be presented to understand the pattern of positivity across different categories of patients. The results obtained from this retrospective analysis were intended to reflect the burden of HBV infection among patients attending the tertiary care hospital and to provide baseline data for strengthening screening practices, infection control measures, and preventive strategies in the region.

Results

A total of 6,712 individuals were screened for HBV infection during the study period, comprising 2,613 male**,** 1,708 non-antenatal female, and 2,391 antenatal female. In Table 1, the analysis was limited to male and non-antenatal female. Among male, 114 of 2,613 screened individuals were positive, yielding a positivity rate of 4.36%, while among non-antenatal female, 78 of 1,708 were positive, giving a positivity rate of 4.57%. Age-wise variation in HBV positivity was statistically significant among both male and non-antenatal female, although the overall difference in positivity between these two groups was not statistically significant. In Table 2, antenatal females were analyzed separately and compared with the combined non-antenatal population, which included both males and non-antenatal females, totaling 4,321 individuals. Among antenatal female, 19 of 2,391 tested positive, corresponding to a much lower positivity rate of 0.79%. In contrast, the non-antenatal population showed 192 positive cases among 4,321 individuals, yielding a positivity rate of 4.44%. This demonstrates that HBV positivity was substantially lower among antenatal female than among the non-antenatal population.

Table 1: Age-wise HBV positivity among male and non-antenatal female; n (%)

Age group	Male			Non-antenatal female		
	Positive	**Negative**	**Total**	**Positive**	**Negative**	**Total**
0–10	2 (0.08)	48 (1.84)	50 (1.91)	3 (0.18)	39 (2.28)	42 (2.46)
11–20	34 (1.30)	676 (25.87)	710 (27.17)	17 (1.00)	282 (16.51)	299 (17.51)
21–30	28 (1.07)	423 (16.19)	451 (17.26)	31 (1.82)	326 (19.09)	357 (20.90)
31–40	21 (0.80)	401 (15.35)	422 (16.15)	10 (0.59)	342 (20.02)	352 (20.61)
41–50	15 (0.57)	381 (14.58)	396 (15.15)	8 (0.47)	315 (18.44)	323 (18.91)
51–60	11 (0.42)	264 (10.10)	275 (10.52)	6 (0.35)	199 (11.65)	205 (12.00)
>60	3 (0.11)	306 (11.71)	309 (11.83)	3 (0.18)	127 (7.44)	130 (7.61)
Total	114 (4.36)	2499 (95.64)	2613 (100)	78 (4.57)	1630 (95.43)	1708 (100)
Statistics	$\chi^2 = 13.31$, df = 6, P = 0.038			$\chi^2 = 23.81$, df = 3, P = 0.787		
	$\chi^2 = 0.08$, df = 1, P = 0.772					

Table 2: Age-wise comparison of HBV positivity among antenatal and non-antenatal population; n (%)						
Age group	**Antenatal**			**Non-antenatal**		
	Positive	**Negative**	**Total**	**Positive**	**Negative**	**Total**
<20	2 (0.08)	405 (16.94)	407 (17.02)	56 (1.29)	1045 (24.01)	1101 (25.30)
21–30	13 (0.54)	1623 (67.88)	1636 (68.42)	59 (1.36)	749 (17.20)	808 (18.56)
31–40	3 (0.13)	247 (10.33)	250 (10.46)	31 (0.71)	743 (17.06)	774 (17.78)
>40	1 (0.04)	97 (4.06)	98 (4.10)	46 (1.06)	1592 (36.58)	1638 (37.63)
Total	19 (0.79)	2372 (99.21)	2391 (100)	192 (4.41)	4129 (95.59)	4321 (100)
Statistics	$\chi^2 = 1.06$, df = 3, P = 0.787			$\chi^2 = 27.29$, df = 3, P < 0.001		
	$\chi^2 = 66.11$, df = 1, P < 0.001					

Discussion

In the present study, HBV positivity among male was 4.36% and among non-antenatal female was 4.57%, with no significant difference in overall sex-wise positivity ($\chi^2 = 0.08$, P = 0.772). This suggests that, in this hospital-based population, the burden of infection was broadly comparable between adult men and non-pregnant women, even though age-wise variation was observed within both groups. The highest number of positive cases was clustered in the 11–40 year age range, particularly 21–30 years**,** which is epidemiologically important because this is the most socially and reproductively active age group. Similar Indian evidence indicates that HBV in hospital and community populations continues to affect young and middle-aged adults, reflecting cumulative exposure through parenteral, sexual, household, and healthcare-related routes [2, 4]. A recent Indian systematic review also confirmed that HBV remains an important public health issue despite declining prevalence in some subgroups, emphasizing that intermediate endemicity still persists in several settings [4]. Thus, the age concentration seen in the present study is consistent with the known epidemiology of HBV in India and underlines the importance of sustained opportunistic screening among adults attending tertiary care centres [4, 5].

An important finding of the study was the markedly lower HBV positivity among antenatal female (19/2391; 0.79%) compared with the non-antenatal population (192/4321; 4.41%), and this difference was highly significant ($\chi^2 = 66.11$, P < 0.001). This observation is in line with recent Indian literature showing relatively low HBV prevalence among pregnant women. A 2022 meta-analysis of Indian antenatal studies estimated pooled HBsAg positivity at around 1.6%, supporting the view that pregnancy-based screening populations often show lower prevalence than mixed hospital attendees [6]. More recent Indian hospital-based data from eastern India also reported HBV infection among pregnant mothers but highlighted the continuing need for universal antenatal screening, counselling, and vaccination awareness to interrupt mother-to-child transmission [7]. Therefore, the low antenatal prevalence in the present study should not reduce the emphasis on routine screening; rather, it reinforces the value of antenatal testing as a preventive strategy, since even a small number of infected mothers may contribute disproportionately to vertical transmission if timely prophylaxis is missed [6, 7].

The present findings also need to be interpreted in the context of Indian screening studies from other hospital-linked populations. Recent evidence from blood donors has shown lower HBV prevalence, likely because donors represent a pre-selected healthier population and are subject to donor-deferral criteria [8]. In contrast, hospital-based screening cohorts often capture individuals from diverse clinical departments, including higher-risk symptomatic or pre-procedural patients, which may explain the higher positivity observed in the current study. A recent Indian retrospective hospital study on blood-borne viral infections likewise found HBV to be the commonest detected viral infection in the screened population [5]. Collectively, these comparisons suggest that HBV prevalence in India is highly population-dependent, with the lowest rates in carefully selected donor and antenatal groups and relatively higher rates in general hospital attendees. For a tertiary care institution, these findings support continued universal or broad-based screening, strict infection-control practices, vaccination of susceptible individuals, and linkage of positive cases for confirmatory evaluation and follow-up. Such measures are essential for reducing undiagnosed infection and for advancing India's hepatitis control goals [7, 8].

In the present study, HBV positivity was markedly lower among antenatal women (19/2391; 0.79%) than among the non-antenatal population (192/4321; 4.41%), and this difference was highly significant ($\chi^2 = 66.11$, df = 1, P < 0.001). Within the antenatal group, most screened women belonged to the 21–30 year age category, and although the highest number of positive cases was also recorded in this age group, the age-wise variation in positivity was not statistically significant **(**$\chi^2 = 1.06$, df = 3, P = 0.787). In contrast, the non-antenatal population showed a clear age-related difference, with significant variation across age groups ($\chi^2 = 27.29$, df = 3, P < 0.001). This pattern suggests that HBV infection in

the general hospital population is influenced by cumulative behavioral, healthcare-related, and household exposure risks, whereas the antenatal group likely represents a younger, more systematically screened population with lower background prevalence. A recent community-based study from West Bengal also reported a relatively low adult HBV prevalence of 0.47%**,** but found higher infection among male and highlighted that a large proportion of adults remained susceptible to HBV, indicating that infection risk persists despite apparently low community prevalence [1]. Same study also emphasized the need to strengthen elimination strategies focused on mother-to-child transmission and adult susceptibility.

The low antenatal prevalence observed in the present study is epidemiologically important. Although only 0.79% of antenatal women were positive, the public health significance remains high because even a small reservoir of infected pregnant women can sustain vertical transmission unless timely screening, birth-dose vaccination, and neonatal prophylaxis are ensured. Recent Indian work has continued to show that HBV burden varies substantially by population subgroup. In a large review of adult immunization in India, hepatitis B vaccination uptake among healthcare workers in cities such as Delhi and Mumbai was still reported to be only 55–64%, indicating persistent gaps in protection even among health-aware groups [9]. Similarly, a recent study among healthcare workers in eastern India found that occupational exposure to blood and body fluids remained common, while only about two-thirds were fully vaccinated against hepatitis B, reinforcing that transmission opportunities remain present within healthcare settings [10]. These observations help explain why hospital-based non-antenatal cohorts may continue to show higher HBV positivity than antenatal screening groups, which are usually reached through organized maternal screening pathways.

The higher HBV positivity in the non-antenatal group in our study is also consistent with Indian evidence from selected higher-risk populations. A 2024 study from a Trans-Himalayan tribal population documented a very high HBsAg prevalence of 23.08%, with particularly concerning positivity among children under 5 years, demonstrating that HBV epidemiology in India is heterogeneous and that some pockets continue to bear a disproportionately high burden [11]. In another Indian retrospective study on chronic HBV infection [12], most patients were men and the mean age was approximately 36 years, which aligns with the concentration of positive cases in the economically productive age groups in the present study. Blood donor-based data, while usually showing lower prevalence than hospital attendees, still indicate ongoing transmission; a 2024 multicentric analysis of seropositive blood donors reported HBV as the most prevalent transfusion-transmitted infection at 0.61%, and a 2025 retrospective blood donor study from Mandsaur also documented a substantial burden of reactive screening markers [13, 14]. Together, these studies suggest that the lower prevalence among antenatal women in our hospital should not be interpreted as evidence of low regional transmission overall; rather, it reflects the fact that prevalence differs by setting, population structure, and pathway of testing.

From a policy perspective, the present findings support a dual strategy: universal antenatal screening to interrupt vertical transmission, and sustained opportunistic screening among non-antenatal hospital attendees to identify missed adult infections. The antenatal findings are reassuring but not negligible, because missing even a few HBsAg-positive mothers can lead to preventable neonatal infection. At the same time, the significantly higher prevalence in the non-antenatal group indicates the need for stronger vaccination, counseling, and infection-control efforts beyond maternal services. This is particularly relevant because recent Indian studies continue to document gaps in hepatitis B awareness and preventive behavior. A 2024 survey among graduating dental students in Odisha found that, despite basic awareness, important deficiencies remained regarding transmission routes and vaccination, suggesting that even future healthcare professionals may not be optimally prepared for HBV prevention [15]. Taken together, the current study and recent Indian evidence indicate that tertiary care hospitals remain important sites for HBV detection and prevention.

Conclusion: The present study showed a relatively low prevalence of hepatitis B infection among the screened hospital population, particularly among antenatal women. However, this should not lessen the importance of sustained prevention and control measures, as HBV remains a significant cause of chronic liver disease and related complications. Early screening, especially during pregnancy, is essential to prevent transmission and to ensure timely intervention. Routine vaccination, health education, and awareness programs for both antenatal women and the general population are necessary to reduce disease burden. A key limitation of this study is its retrospective, single-centre design, which may limit generalizability.

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