

## Spectrum of Hepatitis B Infection Among Patients Attending Liver Unit in Nepalgunj Medical College – Kohalpur

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### ABSTRACT

**Introduction:** Hepatitis B infection is a global problem. Hepatitis B virus (HBV) infection related liver disease is also not an uncommon problem in our country too. Reports regarding pattern of chronic HBV infection are also lacking. The aim of the present study was to determine the spectrum of chronic HBV infection among patients attending the liver clinic in a tertiary care center. **Method:** A hospital based descriptive cross-sectional study was carried out in Liver unit of Nepalgunj Medical College, Kohalpur, from April 2018 to November 2018. All patients with HBsAg positive were further tested for HBeAg, HBeAb, HBV DNA quantitative and liver function test. Ultrasound examination was advised for any evidence of chronic liver disease. Staging was done according to viral serology, liver biochemistry and ultrasonography of liver. **Results:** Total patients enrolled were 119. Majority of patients were in between 30-60 years (51.3%) with male predominance 59.7%. Most of patients were in the stage of HBeAg negative chronic infection 66.4% with normal transaminase and HBV DNA <2000 IU/ML. Majority of patients having unknown source of infection 90.8%. Incidental detection (67.2%) was common mode of detection. **Conclusions:** Majority of patients were in HBeAg negative chronic hepatitis B infection phase with normal transaminase and low HBV DNA not requiring treatment.

**Keywords:** Chronic hepatitis B, Hepatitis Be antigen, Hepatitis B virus, Hepatitis B virus DNA

### INTRODUCTION

Hepatitis B infection which is caused by the hepatitis B virus (HBV), an enveloped DNA virus remains a major global public health problem with significant morbidity and mortality<sup>1,2,3</sup>. Approximately 240 million people are chronic HBV surface antigen (HBsAg) carriers, with a large regional variation of HBsAg positive patients between low (<2%) and high (>8%) endemicity levels<sup>4</sup>. Among Asian countries, Nepal has the lowest prevalence of hepatitis B virus (HBV) infection with an HBsAg carrier rate of 0.9%<sup>5</sup>. Carriers of HBV are at increased risk of developing complications like cirrhosis, hepatic decompensation, and hepatocellular carcinoma (HCC)<sup>6</sup>.

The natural course of chronic HBV infection is determined by the interplay between virus replication and the host immuneresponse and final outcome of CHB infection depends on the stage of CHB infection, severity of liver disease. So early recognition of disease condition is very crucial for prognosis. The aim of present study was to assess the spectrum of CHB infection among patients attending tertiary care center, also this kind of study was lacking in this region too.

### METHODOLOGY

This hospital based descriptive cross-sectional study was carried out in Liver unit of Nepalgunj Medical College, Teaching Hospital, Kohalpur from April 2018 to November 2018. Ethical approval was taken from Institutional Review Board (IRB), NGMC and written informed consent was taken from each patient. All patients attending liver OPD with liver related disease found positive for HbsAg during screening, referred from other departments and other centers with HbsAg positive were enrolled in the study. HbsAg was further confirmed by ELISA. Anti HCV Ab and HIV was also done for co-infection as mode of transmission is similar in all groups. Further evaluation for those found to be HBsAg positive included baseline liver function tests, hepatitis Be antigen (HBeAg), anti-HBeAb and HBV DNA quantification. Anti-HBcIgG, Anti-HBcIgM, Anti HbsAb were done when considered appropriate. Ultrasound examination was advised for any evidence of chronic liver disease and its sequel like ascites, hepatocellular carcinoma (HCC) or portal vein thrombosis. Patients positive for anti-HBcIgM were followed for a further 6 months for viral clearance. Alanine aminotransferase (ALT) levels >40 U/L were considered as elevated for both men and women. Patient information included age, gender, date of detection and duration of HBsAg positivity, family history of liver disease including HCC, past history of tattoo, blood transfusion, jaundice, and surgery were noted. All family members including children of index HBsAg positive patients were advised for HBsAg screening and further evaluation, if found positive. HBsAg negative patients were advised for vaccination against HBV infection. Based on the viral profile and transaminase levels and ultrasound findings, patients were categorized as HBeAg positive chronic infection, HBeAg positive chronic hepatitis, HBeAg negative chronic infection, HBeAg negative chronic hepatitis and acute hepatitis B.<sup>7</sup> Data

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collected in structured proforma were entered in Microsoft Excel 2007 and statistical analysis was done with SPSS 20 software.

## RESULTS

Total patients enrolled in the study were 119. Minimum age was 3 year and maximum age was 80 year. Majority of patients were in the age group of 30-60 years 51.3% (61) with male predominance 59.7% (71) as shown in table I.

<b>Variable</b>		<b>Number</b>	<b>Percentage</b>
<b>Age (Years)</b>	<10	3	2.5%
	10 - 30	45	37.8%
	30 - 60	61	51.3%
	>60	10	8.4%
Mean±SD age: 36.47 ±15.67, Minimum age: 3 years & Maximum age: 82 years			
<b>Gender</b>	Female	48	40.3%
	Male	71	59.7%
<b>Districts</b>	Achham	4	3.4%
	Bajhang	5	4.2%
	Banke	18	15.1%
	Bardia	6	5.0%
	Dadeldhura	1	0.8%
	Dailekh	4	3.4%
	Dang	11	9.2%
	Darchula	2	1.7%
	Dolpa	1	0.8%
	Doti	4	3.4%
	Jagarkot	6	5.0%
	Kailali	28	23.5%
	Kalikot	8	6.7%
	Kanchanpur	6	5.0%
	Rolpa	1	0.8%
	Rukum	4	3.4%
	Salyan	2	1.7%
	Sunsari	1	0.8%
	Surkhet	7	5.9%

**Table I: Showing demographic characters of patients**

Among total enrolled patients majority were HbeAb positive 90.8% (108), Anti HBcIgM positive found in 5 patients. HBV DNA was done only by 107 patients. Majority of patients were having value < 2000iu/ml. 52.3% (56). One patient was co-infected with Hepatitis C infection. T

able III showing possible mode of transmission of HBV infection. Majority of patients having unknown source of infection 90.8% (101). Majority of patients were detected having HBsAg positive incidentally during screening for other purposes as shown in table IV.

<b>Variable</b>		<b>Number</b>	<b>Percentage</b>
HbeAg	Positive	11	9.2%
HbeAb	Positive	108	90.8%
Anti HBcIgM	Positive	5	4.2%
HBV DNA (IU/ML) (n=107)	<2000	56	52.3%
	2000-20000	23	21.5%
	>20000	28	26.2%
Anti HCV Ab	Positive	1	0.8%
HIV	Negative	119	100.0%

**Table II: Showing serological profile**

<b>Variable</b>	<b>Number</b>	<b>Percentage</b>
Vertical	8	6.7%
Post blood transfusion	0	0.0%
IDU	0	0.0%
Hemodialysis	0	0.0%
Sexual	1	.8%
Surgery	0	0.0%
Family histroy	9	7.6%
Unknown	101	90.8%

IDU-intravenous drug user

**Table III: Possible mode of transmission**

<b>Variable</b>	<b>Number</b>	<b>Percentage</b>
Screening during pregnancy	9	7.6%
Screening during surgery	0	0.0%
Screening during blood transfusion	0	0.0%
Incidental detection	80	67.2%
Symptomatic	30	25.2%

**Table IV: Mode of detection**

<b>Variable</b>	<b>Number</b>	<b>Percentage</b>
Acute HBV Infection	4	3.4%
HBe Ag Negative chronic hepatitis	32	26.9%
HBeAg Negative chronic Infection	79	66.4%
HBeAg Positive chronic Infection	4	3.4%

**Table V: Stage of HBV Infection**

Variables	Acute HBV Infection (Mean±SD)	HBeAg Negative chronic hepatitis (Mean±SD)	HBeAg Negative chronic Infection (Mean±SD)	HBeAg Positive chronic Infection (Mean±SD)	*P-Value
Age (Year)	31.25±6.29	50.72±13.66	31.99±12.93	16.25±7.8	<0.001
Bilirubin(mg/dl)	10.53±2.16	3.16±1.41	1.35±0.46	1.1±0.14	<0.001
ALT (u/l)	835.75±399.67	89.38±28.1	37.33±6.9	33.5±0.58	<0.001
HBV DNA (iu/ml)(n=103)	202775±122384.92	61475.84±96038.1	1488.41±3626.87	113775±4912.82	<0.001

**Table VI: Relation between different stage with age, bilirubin level, and ALT and DNA level**

There was significant relation between different stages of HBV infection in relation to age, serum bilirubin level, ALT level and HBV DNA level as shown in table VI.

## DISCUSSION

In present study CHB infection was more common in male gender 59.7% (71) as compared to female 40.3% (48). Majority of patients were in the age group of 30-60 years 51.3% (61). Balasubramanian et al. also reported male preponderance in their study with mean age of men was 40 years and of women was 34 years<sup>8</sup>. Shrestha SM et al, in their prevalence study also reported male predominance but highest prevalence of CHB infection among age groups of 6-15 years compared to 30-60 years in our study<sup>5</sup>. The difference in age group might be explained as our was hospital based study, serological test for HbsAg only done when indicated as compared to their community based prevalence study.

Our study showed serological profile shows HBeAg negative group was more common 90.8% (108) than HBeAg positive group 9.2 % (11). Lahiri et al, also reported majority 89.5 % (384) were HBeAg negative, while 10.5% (45) were HBeAg positive in their study<sup>9</sup>. Similar results were also reported by Amarapurkar et al, 61% (222) HBeAg negative and 39 % (141) were HBeAg positive<sup>10</sup>.

In our study, one patient was found to be co-infected with both hepatitis B and hepatitis C viral infection. Precise study is limited regarding co-infected patients. One study by Desikan et al, from India reported 1.89% co-infected with both virus<sup>11</sup>. Hepatitis B virus (HBV) and hepatitis C virus (HCV) have several important similarities including worldwide distribution, hepatotropism, similar modes of transmission and the ability to induce chronic infection that may lead to liver cirrhosis and hepatocellular carcinoma. Co-infection with both HBV and HCV would be expected to be linked with higher morbidity as well as mortality and impact healthcare resource utilization.

In present study, possible mode of transmission was unknown among majority of patients 90.8 % (101). Vertical transmission was reported in 6.7% (8). Shrestha SM also reported perinatal

transmission is rare in Nepalese population<sup>12</sup>. Another study by Shrestha SM et al, reported horizontal spread was more common among young adults<sup>13</sup>. In a study conducted by Khokhar et al, in Pakistan also reported intramuscular injections and surgery were noted to be frequent risk factors<sup>14</sup>.

In our study most of the patients were detected incidentally during screening for other purposes 67.2% (80). These groups of patients are mostly asymptomatic and study also revealed that asymptomatic subjects with incidental detection of hepatitis B surface antigen (HBsAg), usually have a benign non-progressive course<sup>15</sup>. In our study majority of patients were in HBeAg negative chronic infection 66.4% (79) not requiring treatment, similar observation was also reported by Balasubramanian et al.<sup>8</sup> In this group of patients were having normal bilirubin, normal ALT and low or undetected HBV DNA level comparable to other study also<sup>9</sup>. So in this group of patients, no need of antiviral therapy unless significant fibrosis detected by liver biopsy or other non-invasive tests.

## LIMITATION

In our study, HBV DNA quantitative analysis was not done by all patients and accurate assessment of liver fibrosis which is measured by liver biopsy and or transient elastography (Fibro Scan) is not done in our study.

## CONCLUSION

A significant number of HBsAg-positive patients belong to HBeAg negative chronic hepatitis B infection phase, not requiring treatment.

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