



## STUDY OF HEPATITIS B VIRUS INFECTION AMONG PATIENTS ATTENDING THE TEACHING HOSPITAL

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**ABSTRACT** Viral hepatitis is an important public health problem affecting billions of people across the globe. This study was conducted for a period of one year in a teaching hospital from January 2019- December 2019. Patients who were clinically suspected to have hepatitis and who were advised to undergo HBV screening before any surgical procedure were included in this study. 9643 patients were screened for the presence of HBsAg by HEPACARD- a rapid immunochromatographic test. The reactive samples were subjected to recheck in duplicate and confirmed by Chemiluminescence assay. Samples were considered to be positive if were reactive to both tests. Out of 9643 cases tested for HBsAg, 44 were reactive and 9599 were nonreactive. The present study provides information on prevalence of HBV infection with prevalence being 0.45% and is significantly higher in males and in the age group of young adults (21-40yrs).

### KEYWORDS :

#### INTRODUCTION

Viral hepatitis is an important public health problem affecting billions of people across the globe.<sup>1</sup> Hepatitis B virus (HBV) is one of the main causes of severe liver disease, responsible for 70% cases of chronic hepatitis, 80% cases of cirrhosis-related end-stage liver disease and 80% cases of hepatocellular carcinoma.<sup>2</sup> World Health Organization (WHO) has been estimated that worldwide about 2 billion people have serological evidence of current or past HBV infection and approximately 350 million people are chronically infected with Hepatitis B virus.<sup>2</sup> Annually about 1 million persons die from HBV related chronic liver diseases including severe complications such as liver cirrhosis (LC) and hepatocellular carcinoma (HCC).<sup>3</sup> The prevalence of HBV infection varies among different parts of the world. The World Health Organization (WHO) has classified HBV prevalence into high (>8%), intermediate (2-7%) and low endemic (<2%) areas and India falls in the intermediate range with about 1,00,000 deaths per year.<sup>4</sup>

HBV belongs to Hepadnaviridae family and is DNA virus and has a strong predilection for infecting liver cells. HBV virions are 40–42 nm in diameter, have double-shell, with an outer lipoprotein envelope that contains envelope glycoproteins (or surface antigens).<sup>5,6</sup> The most abundant protein on the virion surface is the 24 kDa hepatitis B surface antigen (HBsAg) or S protein.<sup>5,6</sup>

Hepatitis B virus is very infectious and the primary routes of transmission are sexual transmission, parenteral transmission like pricks by contaminated needles, accidental inoculation of infected blood during surgical and dental procedures, transfusion of blood and its products, dialysis, tattooing, ear/nose pricking etc and perinatal transmission from infected mother to child.<sup>7</sup> HBV is present in high titres in the blood and in low titres in other body fluids and is hundred times more infectious than HIV and ten times more than HCV.<sup>8</sup>

The clinical manifestation of HBV infection ranges from subclinical to acute symptomatic hepatitis or inactive carrier state to chronic hepatitis.<sup>9</sup> The majority of people are not aware of their HBV infection and usually they are only diagnosed when complications such as cirrhosis or hepatocellular carcinoma become evident and this unawareness delays the diagnosis of HBV infection and favors the spread of infection among the people.<sup>10</sup>

HBV infection is diagnosed by serological and virological markers. The hall mark of HBV infection is Hepatitis B surface antigen (HBsAg) and is the first serological marker to appear in acute HBV infection being detectable even before elevation of liver enzymes and onset of clinical illness.<sup>11,12</sup>

Hence with the above background, the present study was undertaken to know the seroprevalence of hepatitis B infection in the patients attending the teaching hospital which helps in preventing the spread of

HBV in the population and improve the public health.

#### MATERIALS AND METHODS

This was a retrospective study conducted for a period of one year in a teaching hospital from January 2019- December 2019. Patients who were clinically suspected to have hepatitis, patients who were advised to undergo HBV screening before any invasive/surgical procedure and pregnant women visiting antenatal care clinic were included in this study. Patients whose blood sample was not requested for screening for HBV, patients who refused to give consent and patients who were immunized with HBV vaccination were excluded from the study. Institutional Ethical Committee approval was taken and informed consent was obtained from all the patients before sample collection. 9643 patients were included in the study whose blood samples were screened for HBV.

3ml of blood sample was collected with aseptic precautions from the patients who advised to undergo HBV screening. Serum was separated and tested for the presence of HBsAg by HEPACARD- a rapid immunochromatographic test based on the principle of one step immunoassay (Diagnostic enterprises, India). Test was performed and results were interpreted as per manufacturer manual.<sup>13</sup> The reactive samples were subjected to recheck in duplicate and repeatedly reactive samples were confirmed by Chemiluminescence assay. Samples were considered to be positive if were reactive to both tests.

#### RESULTS

In the present study, serum samples were collected from 9643 patients who were advised to undergo HBV screening and tested for the presence of HBsAg.

Out of 9643 cases, 3931 (40.76%) were males and 5712(59.23%) were females (Table 1). Age distribution of the patients includes, 36 (0.37%) were in the age group < 1 yr, 559(5.79%) of 1-10 yrs, 631(6.54%) of 11-20 yrs, 3653(37.88%) of 21-30 yrs, 1397(14.48%) of 31-40yrs, 1028 (10.66%) of 41-50 yrs, 749 (7.76%) of 51-60yrs, 762(7.90%) of 61-70yrs, 619(6.41%) of 71-80yrs and 209 (2.16%) of > 80yrs, majority of the patients were in the age group of 21-30yrs. (Table 2)

**Table 1: Sex Distribution**

Sex	No.of patients	Percentage
Male	3931	40.74%
Female	5712	59.23%
<b>Total</b>	<b>9643</b>	<b>100%</b>

**Table 2: Age Distribution**

Age	No.of patients	Percentage
<1yr	36	0.37%
1-10yrs	559	5.79%
11-20yrs	631	6.54%

21-30yrs	3653	37.88%
31-40yrs	1397	14.48%
41-50yrs	1028	10.66%
51-60yrs	749	7.76%
61-70yrs	762	7.90%
71-80yrs	619	6.41%
>80yrs	209	2.16%
<b>Total</b>	<b>9643</b>	<b>100%</b>

In this study, out of 9643 cases tested for HBsAg, 44 were reactive and 9599 were nonreactive, the prevalence of HBV infection being 0.45%. (Table3)

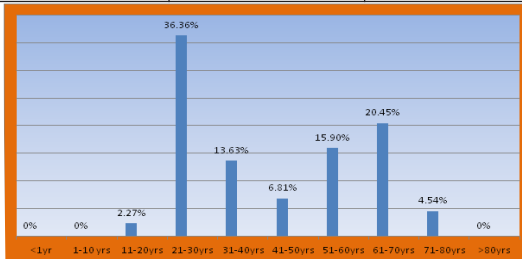
**Table 3: Seropositivity for HBV**

Results	Number of samples	percentage
HBsAg reactive	44	0.45%
HBsAg non reactive	9599	99.54%
<b>Total</b>	<b>9643</b>	<b>100%</b>

Out of 44 reactive cases, 29 (65.9%) were males and 15 (34.1%) were females with seropositivity was more in males. (Table 4) Majority of the patients tested reactive were in the age group of 21-30 yrs (n=16, 36.36%), followed by age group of 61-70yrs (n=9, 20.45%). (Figure 1)

**Table 4: Sex distribution of Reactive cases of HBV**

Sex	No. of positives	Percentage
Male	29	65.9%
Female	15	34.1%
<b>Total</b>	<b>44</b>	<b>100%</b>



**Figure 1: Age-wise distribution of reactive cases of HBV**

**DISCUSSION**

HBV infection is one of the most common viral infections. Globally, there are about 350–400 million people suffer from this infection with 1 million deaths annually due to complications of this infection.<sup>12</sup>

In the present study, overall seropositivity for HBsAg was 0.45%, this finding is in correlation with other studies conducted by Trupti B. Naik .et al,<sup>14</sup> Sood et al,<sup>15</sup> Karandeep Singh. et al,<sup>16</sup> Shyamala R. et al.<sup>17</sup> The prevalence of hepatitis B varies from country to country and it depends upon behavioral, environmental, and host factors.<sup>18</sup> There is a variation in HBsAg prevalence in different geographical regions in India, the overall rate of seropositivity varies from 2% to 4.7%. India lies in intermediate zones of prevalence rates as set by the World Health Organization.<sup>18,19</sup>

Out of 44 reactive cases, 29 (65.9%) were males and 15 (34.1%) were females, with prevalence of HBV infection being more in males than females which is in concordance with other studies conducted by Trupti B. Naik. et al,<sup>14</sup> Khatoon R. et al,<sup>20</sup> Rukadikar A. et al,<sup>21</sup> Mittal G. et al,<sup>22</sup> and Vazhavandal G. et al.<sup>13</sup> The possible reason for this higher male predominance is higher exposure of males to risk factors such as illicit drug use and multiple sexual partners. In addition, it has been reported that compared to males, females tend to clear HBsAg from their plasma more efficiently.<sup>23,24</sup>

Majority of the patients tested reactive were in the age group of 21-30 yrs (36.36 %), followed by age group of 61-70 yrs (20.45%). These findings are similar to other Indian studies conducted by Ajay Mathur. et al,<sup>25</sup> Rajani et al,<sup>26</sup> Trupti B. Naik .et al,<sup>14</sup> Khatoon R. et al,<sup>28</sup> Kanodia V. et al,<sup>2</sup> Vazhavandal G. et al,<sup>13</sup> Gokale et al<sup>27</sup> Mindolli. et al,<sup>28</sup> Bule. et al,<sup>29</sup> and Bula. et al.<sup>30</sup> The higher prevalence among 21–40 years age group could be due to high risky behaviour among young individuals and also higher exposure to occupational risk factors.<sup>2</sup>

**CONCLUSION**

The HBV is a silent disease and highly infectious, spreads with even

minute traces of infected blood.<sup>20</sup>

The present study provides information on prevalence of HBV infection with prevalence being 0.45%. The study shows prevalence rate is significantly higher in males and in the age group of young adults (21-40yrs).

Early laboratory detection of the HBV infection is essential to prevent transmission of the infection and HBV related morbidity and mortality. Educating the people, regarding HBV infection and its preventive measures and about vaccination against the HBV are essential measures to control and prevent the HBV infection.<sup>31</sup>

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