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# PREVALENCE OF HBSAG IN PATIENTS ATTENDING TERTIARY CARE HOSPITAL IN NORTHERN INDIA

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## ABSTRACT

The term viral hepatitis refers to a primary infection of the liver by any one of a heterogeneous group of hepatitis virus. Type B hepatitis is the most widespread and the most important type of viral hepatitis. Hepatitis B Virus infection is transmitted by parenteral, sexual or perinatal mode. Hepatitis B surface Antigen (HBsAg) detection by card test and ELISA are the most frequent techniques used for screeningThe aim of the study was to detect the prevalence of HBsAg among the patients attending tertiary care hospital in Barabanki, Uttar Pradesh, India. Blood samples that were routinely sent for HBsAg detection were included in the study. After separating the serum, card test for HBsAg and ELISA for hepatitis B antigen was performed. The numbers of samples positive for HBsAg were 128 out of 2464 total samples collected. The prevalence was highest among women. The age group having the highest prevalence rate was from 31-60 years.

**Key word**: **Hepatitis B, ELISA, Prevalence, HBsAg, Liver disease**

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# INTRODUCTION

The term viral hepatitis refers to a primary infection of the liver by any one of a heterogeneous group of hepatitis virus which currently consists of A, B, C, D,E and G.Hepatitis viruses are taxonomically unrelated except for type B, which is a DNA virus from the Hepadnaviridae family , all the others are RNA virus. Type B hepatitis is the most widespread and the most important type of viral hepatitis. Hepatitis B surface antigen is a surface component of Hepatitis B virus. The pathogenesis of hepatitis appears to be immune mediated. In the absence of adequate immune response, HBV infection may not cause hepatitis, but may lead to a carrier state. A carrier is a person with detectable HBsAg in blood for more than 6 months. HBV infection is transmitted by parenteral, sexual or perinatal mode. HBV is about a hundred times more infectious than human immunodeficiency virus[1, 6]. Globally, HBV related chronic infections are linked to nearly 60% cases of non- alcoholic cirrhosis and 80% cases of hepatocellular carcinoma[3]. End stage liver disease accounts for about one in 40 deaths.[6] Of the 2.6 Crore (26 million) infants born every year in India, approximately 10 Lakhs (1 million) run the life-time risk of developing chronic HBV infection[1, 7].Following infection, about 5-10% of adult, 30% of children and 90% of neonates become carriers. Based on the prevalence of Hepatitis B surface Antigen (HBsAg), different areas of the world are classified as having high (>8%), intermediate (2–7%) or low (<2%) HBV endemicity. Countries which have high endemicity (where >8% of the population is HBsAg-positive) include South-East Asia, China, most of Africa, most of Pacific Islands, the Amazon basin and parts of the Middle East. Countries with intermediate endemicity (2–7%) include South Asia, Eastern and Southern Europe, Russia and Central and South America. The areas with low endemicity (<2%) include United States, Western Europe and Australia [1, 5]. India harbors 10–15% of the entire pool of HBV carriers of the world hence included among high endemicity region[1, 6]. The total HBV carrier pool in India is around 43 million and about 1 million new HBV carriers are added to this pool annually[5]. The average estimated carrier rate of HBV in India is 4.7%[6]. HBsAg detection by card test and ELISA are the most frequent techniques used for screening of HBV. As India falls under the high endemic region, this study was carried out in a tertiary care hospital in Barabanki, Uttar Pradesh to identify the prevalence rate of HBV among the masses.

# MATERIALS AND METHODS

This prospective study was carried out in The Department of Microbiology, Hind Institute of Medical Sciences, Barabanki, and Uttar Pradesh over a period of one year from March 2014 to March 2015. Samples that were routinely sent for HBsAg detection were included in the study after obtaining proper consent from the patient.

### *Procedure for card test*

Blood sample was drawn from each participant under strict aseptic precautions in a plain vaccutainer. Blood was allowed to clot and serum was separated after centrifuging it at 5000 rpm for 15 minutes. The test card [HEPACARD- J. Mitra and Co. Private Limited India] was labeled with patient details. 5 µl of serum was added through the sample window and allowed it to soak. 2 drops of diluent was added next and result was read within 10- 15 min. Appearance of both test and control band indicated the presence of HBsAg. Remaining part of the serum was stored at –20◦C for ELISA.

### *Procedure for ELISA*

Samples were then screened for HBsAg by Enzyme linked immune sorbent assay [Hepalisa-J. Mitra and Co. Private Limited India] [2] The stripholder was fitted with the required number of HEPALISA strips.The assay was arranged in a horizontal configuration. 100 µl of Negative Control and Positive Control were added respectfully in well numbered A1, B1, C1 and D1. Wells following which 100 µl of sample in each well, starting from E1. 50µl of working Enzyme conjugate was added to each well and gently shaken for 2-3 seconds to mix the sample & conjugate. The plate were then covered and incubated in an incubator at $37^0$C for 60 minutes.At the end of incubation period, the

plates were washed with working wash buffer manually.The wells were dried after washing and 100µl of working substrate solution was added in all the wells.The plate was then covered with an aluminum foil and incubated at room temperature (20-25°C) for 30 minutes in dark. Reaction was stopped by adding 100µl of stop solution to each well, mixing it gently. Absorbance at 450 nmwas read within 30 minutes in ELISA READER.

## RESULTS

- Out of 2464 samples, 128 were positive for HBsAg and the rest 2337 turned out to be negative. The number of sample positive for card test were 119, which increased with 9 more in result of ELISA making a sum total of 128 positive outcomes.
- The prevalence of HBsAg among females was found to be higher than males. The overall prevalence rate was deduced to be 5.19%.
- The highest number of patients was among the age group 31-60 years and the lowest from the group of 61 years and above.
- The higher positive outcome was among females [5.29%], whereas in males it was found to be less [5.07%].
- The age group which had the maximum prevalence rate was in between 31-60 years and the least was of the age group 61 years and above.

**Table I**
***showing the data for positive and negative outcomes of the study***

| Total no.of Samples | Positive outcome | | Negative outcome | |
|---|---|---|---|---|
| | Hepa Card | Elisa | Hepa Card | ELISA |
| 2464 | 119 | 128 | 2345 | 2336 |

**Table II**
***showing the gender wise prevalence of HBsAg***

| Gender | Total Samples | Total positive outcome | |
|---|---|---|---|
| | | No. | % |
| MALE | 1162 | 59 | 5.07 |
| FEMALE | 1302 | 69 | 5.29 |
| TOTAL | 2464 | 128 | 5.19 |

**Table III**
***showing the overall distributionof patients according to age group***

| Age Group | Male | | Female | |
|---|---|---|---|---|
| | No | % | No | % |
| 0-15 | 137 | 64.01 | 77 | 35.98 |
| 16-30 | 400 | 38.61 | 636 | 61.38 |
| 31-60 | 511 | 48.48 | 543 | 51.51 |
| 61+ | 114 | 71.25 | 46 | 28.75 |
| Total | 1162 | 47.15 | 1302 | 52.84 |

**Table IV**
***showing the data of the overall distribution of HBsAg positive outcome.***

| Age Group [yrs.] | Hepa Card | | | | ELISA | | | |
|---|---|---|---|---|---|---|---|---|
| | MALE | | FEMALE | | MALE | | FEMALE | |
| | No. [n=56] | % | No. [n=63] | % | No. [n=59] | % | No. [n=69] | % |
| 0-15 | 9 | 16.07 | 4 | 6.34 | 9 | 15.25 | 4 | 5.79 |
| 16-30 | 17 | 30.35 | 26 | 41.26 | 17 | 28.81 | 29 | 42.02 |
| 31-60 | 24 | 42.85 | 31 | 49.20 | 26 | 44.06 | 34 | 49.27 |
| 61+ | 6 | 10.7 | 2 | 0.31 | 7 | 11.86 | 2 | 2.89 |
| Total | 56 [n=1162] | 4.81 | 63 [n=1302] | 4.83 | 59 [n=1162] | 5.07 | 69 [n=1302] | 5.29 |

## DISCUSSION

HBV related acute viral hepatitis is a global public health concern associated with substantial mortality and morbidity[6,9]. Classified as a region of high endemicity, India accounts to 10-15% of the total HBV carrier in the world. In our study among 2464 patients, 119 were positive for card test and increased to 8 more while ELISA was performed which took the total to 128 positive samples, which accounts for a prevalence rate of 5.19%, which was much higher to study carried out by Gard et al where the sero prevalence was 0.32 % and Rajani et al where prevalence was 4%[6]. On a contrary a study by Kamat et al showed seroprevalence rate of 17.4% which may be because of the patients included suffered from liver disease[7]. The prevalence among women was 5.29%, which was slightly higher that men i.e. 5.07 percent. Though studies could be found were the sero-prevalence was higher in females, a higher seroprevalence rate was found among men by Kamat et al. The reason for higher prevalence among women may be contributed due to the high population count of females in this study. The highest prevalence rate was among patients between 16-60 years, showing similarity with the study conducted by Zirabaet al[10]. Being among the working age group, people of 16-60 years are more susceptible to HBV infection.

## CONCLUSION

Hepatitis B contributes significantly to chronic liver diseases in India. Being transmitted through parenteral, sexual or perinatal mode, proper medical education must be provided to the general public either through health care workers or the government. HBV vaccination should be included in the National vaccination Program to further restrict the spread of HBV along with vaccination among high risk workers.

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**CONFLICT OF INTEREST**

Conflict of interest declared none.

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