

## Seroprevalence of Hepatitis B Surface Antigen among Antenatal Women Attending a Tertiary Care Hospital

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### Abstract

**Introduction:** Infection with the hepatitis B virus (HBV) occurs worldwide and constitutes a major public health problem. Perinatal transmission is one of the commonest modes of HBV transmission worldwide. Transmission of HBV from carrier mothers to their babies can occur during the perinatal period, and appears to be the most important factor in determining the prevalence of infection in high endemicity areas.

**Objectives:** To know the seroprevalence of HBV in antenatal women.

**Material and Methods:** The present study was conducted from January 2015 to December 2015. Antenatal women of 17yrs – 45yrs were included in the study. HBsAg detection was done by immunochromatographic method.

**Results:** Among total 6982 Antenatal women, half of them were in the age group of 21yrs – 25yrs (3553; 50.88%). The mean age of HBsAg seropositivity was 26.05yrs  $\pm$  5.24yrs. The median age in overall cases as well as among seropositives was 25yrs. Highest seroprevalence was seen in the age group of 31yrs – 40yrs (2.51%). HBV seroprevalence was 1.30%.

### Conclusion:

The finding of HBsAg seropositivity in pregnant women in the present study supports that antenatal screening for HBsAg is a helpful strategy for the prevention of vertical transmission of HBV infection and the carrier state of infants.

### Keywords:

Antenatal women, HBsAg, Seroprevalence, Vertical transmission.

### Introduction

Infection with the hepatitis B virus (HBV) occurs worldwide and constitutes a major public health problem. (1, 2, 3) It leads to a wide spectrum of clinical presentations, ranging from asymptomatic carrier state to acute self-limiting infection or fulminant hepatic failure, chronic hepatitis with progression to cirrhosis, and hepatocellular carcinoma (HCC).(4) HBV infection may go undetected (1) as it is asymptomatic in infants, children and immunodeficient individuals as pathogenesis of hepatitis is immune mediated. Therefore infants, children and immunodeficient individuals are more likely to become asymptomatic carriers following infection. (5) Infection is usually only diagnosed when complications such as cirrhosis or hepatocellular carcinoma become evident. (6) Unawareness of an ongoing infection delays the diagnosis of HBV-related liver disease and favors the spread of the virus. (1) Transmission of HBV from carrier mothers to their babies can occur during the perinatal period, and appears to be the most important factor in determining the prevalence of infection in high endemicity areas. India has intermediate endemicity of HBV infection, with population prevalence rate of around 4% (2-8%). (4) and the number of HBV carriers is estimated to be around 50 million, forming the second largest global pool of chronic HBV infection. (2) Perinatal transmission is one of the commonest modes of HBV transmission worldwide.(7) , is believed to be responsible for a third of adult chronic carriers of hepatitis B in India.(8) Detection of carriers is important in control of infections.(9)

Routine antenatal hepatitis B surface antigen (HBsAg) screening and immunization of risk babies is very effective in preventing perinatal transmission of hepatitis B virus (HBV).(10) Hence we made an attempt to know the prevalence of HBsAg positivity in antenatal mothers who attended our hospital during their first visit.

## Materials and methods

**Objectives:** To know the seroprevalence of HBV in antenatal women.

**Inclusion criteria:** Antenatal mothers, who attended A/N clinics for check-up, who are otherwise healthy.

**Exclusion criteria:** Antenatal mothers with present or past history of jaundice.

**Materials and methods:** The present study was conducted between January 2015 and December 2015. Antenatal women of 17yrs – 45yrs attending antenatal outpatient department were included in the study. 2ml of venous blood was collected from each individual under aseptic conditions. After separation of serum from blood, HBsAg detection was done by immunochromatographic method in Microbiology clinical laboratory, RIMS, Kadapa. Standard operative test procedure was followed every time.

**Statistical analysis:** Data was entered in Microsoft Excel for analysis.

## Results

Out of the total 6982 samples, around half of samples were from 21yrs – 25yrs age group (3553; 50.88%) and around one fourth samples were from the age group of 26-30 years (1775; 25.42%). The mean age of total cases was 25.22yrs  $\pm$  5.0089yrs. Maximum number of seropositive cases were seen in the age group of 21yrs – 25yrs (52/91). But seroprevalence in that group was 1.463% (52/3553). Highest seroprevalence was seen in the age group of 31yrs – 40yrs (2.51%) followed by 36yrs- 40yrs (1.92%). Total seroprevalence among all cases was 1.30% as shown in table 1.

The mean age of HBsAg seropositivity was 26.05yrs  $\pm$  5.24yrs. The median age in overall cases as well as among seropositives was 25yrs as shown in table 2.

**Table 1 showing distribution of sero positive cases in different age groups**

| Age group in years | No of cases   | Seropositive cases | Percentage of seropositivity |
|--------------------|---------------|--------------------|------------------------------|
| <20                | 1353 (19.37%) | 8                  | 0.59                         |
| 21- 25             | 3553 (50.88%) | 52                 | 1.46                         |
| 26-30              | 1775 (25.42%) | 24                 | 1.35                         |
| 31-35              | 239 (3.42%)   | 6                  | 2.51                         |
| 36-40              | 52 (0.74%)    | 1                  | 1.92                         |
| 41-45              | 10 (0.14%)    | 0                  | 0.00                         |
| Total              | 6982          | 91                 | 1.30                         |

**Table 2 showing various statistical parameters of the present study**

| Statistical parameter | Sero positive cases | Total cases |
|-----------------------|---------------------|-------------|
| Mean                  | 26.05               | 25.22       |
| Median                | 25                  | 25          |
| Standard deviation    | 5.2476              | 5.0089      |

## Discussion

While it is generally accepted that the modality of HBV transmission in India is horizontal, the recent report by Dwivedi et al showing a high prevalence of hepatitis markers suggest that there may be a significant role of vertical transmission as well. (2) The risk of vertical transmission of HBV infection to the unborn child may be related to the effect of HBV infection on the mother, how she responds to the infection, the timing of the infection with respect to the current pregnancy and the immune status of the mother as well as the levels of HBV DNA. The probability of

vertical infection is, however, much increased when the mother is also positive for HBeAg.(11) It is advisable that infants born to HBsAg-positive mothers should receive passive (0.5ml of Hepatitis-B-Immunoglobulin -HBIG) and active (Hepatitis-B Vaccine) immunoprophylaxis within 12 hours of birth. (3) to provide high levels of protection against vertical transmission. (12) In countries where there is high disease endemicity and where HBV is mainly spread from mother to infant at birth or from child to child during early childhood, providing the first dose of Hepatitis-B Vaccine at birth is critical. (13) India has been grouped as countries with intermediate endemicity, the sheer enormity of the population of the region accounts for a large chunk of the entire pool of HBV carriers of the world (14)

The median age of participants in present study was 25yrs (17 – 45yrs) which is almost near to a study by Pontius Bayo et al (24yrs). (11)The mean age of participants was 25.22yrs  $\pm$ 5yrs which is equal to a study by Frambo et al (25.7  $\pm$  5.4 yrs) and a little less than in the studies by Fomulu et al & T.K.V. Sharavanan et al.(7, 2)

The maximum cases of seropositivity of HBsAg among antenatal women in present study were between the age group of 21yrs – 25yrs (52/ 3553). In studies by Agarwal et al , Mehta et al and Parveen et al the maximum positive cases were also in the same age group.(9,15,4). The present study highest seroprevalence was seen in the age group of 31yrs – 40yrs (2.51%).Where as it was seen in 25yrs – 29yrs in one study (7) and in 15-19yrs in another study.(1)

The overall sero prevalence was 1.30% in our study (91/6982) which is comparable to studies by Alexander et al (1.58%) & Nandan et al(1.65%) and more when compare to studies by Agarwal et al (0.18%), Ganczak et al (0.6%) and Parveen et al (0.61%)(8,16,9,17,4) whereas it is less to studies by Mehta et al (2.9%), Vipul et al (3.07%), Rumi et al (3.5%), Banarjee et al (3.75%), Sharavanan et al (3.8%), Rashid et al (3.9%). (15, 12, 10,18,2, 19) There is a wide variation in the prevalence in different regions of our country. (4). Whereas seroprevalence seropositivity of HBsAg in some studies from African countries was much high.(1,3,7) Indicates that the prevalence of hepatitis B varies from country to country based on socioeconomic status and availability of medical facilities.

By screening antenatal mothers for HBsAg and by testing for HBeAg in HBsAg positive mothers it would be possible to provide combined immunization to newborn babies of HBsAg & HBeAg positive mothers soon after birth. In this way we can prevent carrier state in these newborns who will be potential source of infection in the near future. In addition to this as HBV vaccine is already included in universal immunization programme, it would be possible to reduce endemicity of HBV disease from intermediate to low endemicity in our country, as demonstrated in Taiwan.(20)

Moreover medical health personnel would take extra precautions during labour of antenatal mothers who are HBV positive, as there is every chance of HCPs to come into contact with blood and body fluids of antenatal that are highly infectious.

## Conclusion

1. The mean age of total cases was 25.22yrs  $\pm$ 5yrs
2. Total seroprevalence among all cases was 1.30%.
3. Highest seroprevalence was seen in the age group of 31yrs – 40yrs (2.51%).
4. The finding of HBsAg seropositivity in pregnant women in present study supports that antenatal screening for HBsAg is a helpful strategy for the prevention of vertical transmission of HBV infection and the carrier state of infants.

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**Conflict of interest:** Nil

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