



Status of prevalence of hepatitis-B in pregnant women: A hospital based study

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Abstract

India has more than 37 million of HBV carriers and contributes a large proportion of the global burden. The perinatal route is the most important route of the transmission. This study was done to estimate the seroprevalence rate of HBV infection in female of reproductive age group. Since sexual and perinatal route transmission are major targets to prevent the infection, the study focused on pregnant females attending antenatal care (ANC) clinic of the hospital. This was a retrospective observational study to determine the prevalence of Hepatitis B surface antigen (HBsAg) in Pregnant Women. Two and a half years retrospective study was performed from June 2019 to December 2021. The blood sample was collected as a part of routine screening for HBV infection and the samples were tested for HBsAg. Of the total 1353 antenatal women, 11 (0.81%) were positive for HBsAg in 2019. In the year 2020, of the total 4186 antenatal women, 43 (1.02%) were positive for HBsAg. In the year 2021, of the total 3903 antenatal women, 21 (0.53%) were positive for HBsAg. It is important to screen all the antenatal women for HBsAg to prevent maternal complications and, its transmission to the child and to manage appropriately.

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Introduction

Hepatitis B Virus (HBV) infection is a global public health problem (Dortey *et al.*, 2020; Abdi *et al.*, 2015). HBV, a DNA virus transmitted percutaneously, sexually and perinatally (El-Magrahe *et al.*, 2010). Despite having an effective and safe vaccine, it affects 350-400 million individuals worldwide (El-Magrahe *et al.*, 2010; Sibia *et al.*, 2016). Among the five different hepatitis viruses, most common virus that affects liver is Hepatitis B virus (Banca *et al.*, 2020). It causes both chronic infection and has a high risk of development of cirrhosis and liver cancer (Yohanes *et al.*, 2016).

The vertical transmission of HBV from infected mothers to their neonates is one of the most important routes of infection worldwide (Shoghli *et al.*, 2014; Sirilert *et al.*, 2021). Some believe that chronic carriers of HBV in pregnancy are associated with increased rates of miscarriage, gestational diabetes and preterm labor. Chorion angiopathy and reduced function of placenta are the main cause of fetal distress in pregnant women (Abdi *et al.*, 2015).

Barriers to eradication of HBV transmission to offspring include under-utilization of immunoprophylaxis with hepatitis B vaccination and HBV immune globulin (HBIG), as well as failure of immunoprophylaxis. Female patients of childbearing age present a unique challenge to clinicians, who must facilitate appropriate counselling to ensure safe treatment of a mother during pregnancy (Ayoub *et al.*, 2016).

Many international organizations (Advisory Committee on Immunization Practices, World Health Organization) recommend that all pregnant women to be tested for HBsAg. For many years, even though HBV vaccine & HBIG has been administered to the infant against HBV, perinatal transmission is observed in 10% of children born to mothers with high levels of viremia. For this reason, oral antiviral use in the

last trimester has been recommended in some pregnant women in recent years (Bilman *et al.*, 2021).

The UIP (Universal Immunization Program) schedule of India recommends Hepatitis B vaccine to all infants within 24 hours of birth, followed by three doses at 6, 10 and 14 weeks to complete the schedule. In case of an un-immunized adult, the vaccine administered at 0, 1 and 6 months (Das *et al.*, 2019).

Hence this study was done to determine the seroprevalence of HBsAg in otherwise healthy antenatal women.

Materials and methods

This retrospective study analysed records of microbiology lab registry at a District hospital attached to Chamarajanagar institute of medical sciences, Chamarajanagar for a period of two and a half years, i.e., from 1st June 2019 to 31st December 2021. A detail of a total of 9442 pregnant women subjected to screening of HBsAg using rapid test formats (Immunochromatographic method) was recorded. Data thus obtained has been analysed. Analysis was done using MS Excel.

Total of samples 1353 of antenatal women were tested for HBsAg in 2019. In the year 2020, total of 4186 samples of antenatal women were tested for HBsAg. In the year 2021, total of 3903 samples of antenatal women were tested for HBsAg.

Samples were subjected to rapid test formats such as Immunochromatographic (ICT) method. Tests were performed out according to manufacturer's instruction. Data were collected from microbiology lab registers.

Ethical considerations

Ethical clearance was obtained from Institutional Ethical Clearance Committee, Chamarajanagar Institute of Medical Science, Chamarajanagar.

Results

In our study, we tested total of 1353 samples for HBsAg in pregnant women. Overall seroprevalence of HBsAg in pregnancy in our study in 2019 was 11 (0.81%) (Table 1). In the year 2020, of the total 4186 antenatal women, 43 (1.02%) were positive for HBsAg (Table 2). In the year 2021, of the total 3903 antenatal women, 21 (0.53%) were positive for HBsAg in pregnancy (Table 3).

Table 1. Seroprevalence of HBsAg in Pregnancy in 2019.

Month	Total no. of HBsAg in ANC Samples received	HBsAg positives in ANC	Percentage
June	182	02	1.09%
July	150	02	1.33%
August	113	00	00%
September	169	01	0.59%
October	230	01	0.43%
November	252	02	0.79%
December	257	03	1.16%
Total	1353	11	0.81%

Table 2. Seroprevalence of HBsAg in Pregnancy in 2020.

Month	Total no. of HBsAg in ANC samples received	HBsAg positives in ANC	Percentage
Jan	254	01	0.39%
Feb	280	05	1.78%
March	303	02	0.66%
April	380	00	00%
May	376	03	0.79%
June	376	11	2.92%
July	306	04	1.30%
August	369	03	0.81%
September	418	02	0.47%
October	448	03	0.66%
November	297	02	0.67%
December	379	07	1.84%
Total	4186	43	1.02%

In 2019, age group of 28-32 i.e., 04 (36.3%) had the highest rate of positive HBsAg prevalence (Table 4). In 2020 & 2021, age group of 23-27, i.e., 16 (37.2%) & 07 (33.3%) respectively had the highest rate of positive HBsAg prevalence (Table 5 & 6).

Table 3. Seroprevalence of HBsAg in Pregnancy in 2021.

Month	Total no. of HBsAg in ANC samples received	HBsAg positives in ANC	Percentage
Jan	328	02	0.60%
Feb	295	05	1.69%
March	138	00	00%
April	109	01	0.91%
May	273	01	0.36%
June	295	01	0.33%
July	336	00	00%
August	397	01	0.25%
September	438	02	0.45%
October	448	02	0.44%
November	420	03	0.71%
December	426	03	0.70%
Total	3903	21	0.53%

Table 4. Age group of HBsAg in Pregnancy in 2019.

Category	Frequency	Percent (%)
18-22	03	27.27%
23-27	01	9.09%
28-32	04	36.3%
>= 33	03	27.27%
Total	11	100%

Table 5. Age group of HBsAg in Pregnancy in 2020.

Category	Frequency	Percent (%)
18-22	10	23.2%
23-27	16	37.2%
28-32	11	25.5%
>= 33	06	13.9%
Total	43	100%

Table 6. Age group of HBsAg in Pregnancy in 2021.

Category	Frequency	Percent (%)
18-22	06	28.57%
23-27	07	33.33%
28-32	04	19.0%
>= 33	04	19.0%
Total	21	100%

Discussion

HBV infection are classified based on the prevalence as high ($\geq 8\%$), intermediate (2-7%) or low HBV endemicity ($<2\%$). India falls under the category of intermediate endemicity zone (average of 4%). In India, HBsAg positivity varies from 1.1% to 12.2% in general population, with an average being 3-4% (Das *et al.*, 2019).

Screening asymptomatic people is an important instrument of disease detection, prompt diagnosis and intervention especially concerning a typically asymptomatic infection such as chronic HBV infection itself. Thus, this study aimed to assess the prevalence of hepatitis B virus infection in antenatal women. In our study total of 9442 pregnant women were screened for Hepatitis B surface antigen (HBsAg).

Overall seroprevalence of HBsAg in pregnancy in our study in 2019 was 11 (0.81%) which correlates with the study of Shoghli *et al.* (2014) who reported overall 1.2% positive HBsAg in pregnant women.

In the year 2020, of the total 4186 antenatal women, 43 (1.02%) was found to be positive for HBsAg, which correlates with the study of Sathiyakala Rajendiran *et al.* who detected the prevalence rate of HBsAg to be 1.01 % (Rajendiran *et al.*, 2017).

In the year 2021, of the total 3903 antenatal women, 21 (0.53%) were positive for HBsAg in pregnancy which correlates with the study of Preetkanwal Sibia *et al.* who detected the seroprevalence of HBsAg positive pregnant females was 1.11% (Sibia *et al.*, 2016).

In our study in the year 2020 & 2021, age group of 23-27 i.e., 16 (37.2%) & 07 (33.3%) respectively had the highest rate of positive HBsAg prevalence which correlates with the study of Bancha *et al.* (2020) who reported the majority of HBsAg infection between the age group of 23-27, i.e., 289 (42.8%).

Every pregnant woman should be screened for HBsAg testing irrespective of previous testing or vaccination status. To prevent HBV transmission to new-borns, testing and identification of HBV-positive pregnant women is the most effective way. Despite the use of passive/active prophylaxis new-borns can acquire the infection rarely in case of women with very high viremia.

Hence, antiviral treatment in the third trimester can be considered. Decisions on discontinuation should be done taking into account the stage and activity of liver disease and of infection, and also the risk of post-partum hepatitis flare. Breastfeeding is not recommended for women taking anti-viral drugs. There is no clear evidence that Emergency caesarean section (ECS) reduces the risk of mother-to-child transmission compared to vaginal delivery (Borgia *et al.*, (2012).

Conclusion

Our study showed prevalence of < 1% which falls under the category of low endemicity zone. Screening of antenatal women for HBsAg helps in prevention of maternal complications, risk to the child and to manage appropriately.

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