

## Seroprevalence and effect of Hepatitis B and effect on pregnancy at a tertiary care hospital in North Karnataka

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### Abstract

**Introduction:** Hepatitis B virus (HBV) infection is a global public health problem. HBV infected pregnant mothers act as a constant source of infection to the babies. This leads to increased chronic cases of HBV infection despite effective vaccine & antiviral therapy. Thus it becomes very essential to detect such unsuspected otherwise healthy HBV carriers & cases.

**Patients and Method:** A retrospective study was aimed to study seroprevalence rate of HBV in all pregnant mothers attending the obstetric services from May 2015 to May 2016. All HBsAg positive cases & their babies' case records were reviewed to study the clinical, demographic data, HBV vaccination & HBV status of the baby.

**Results:** Prevalence rate is 1.68% in 3800 screened cases. Most cases were from the age group 20-24 years. Primigravids & multigravids were equally infected. Out of 14 delivered cases in the hospital, 13 had live babies & only 1 had IUD. 11 delivered by normal labour whereas only 3 delivered by caesarean section. 3 babies had low birth weight (<2.5kg) whereas 10 babies had birth weight more than 2.5kg. All the babies were fully vaccinated. Only 2 babies' cases records were available for HBsAg testing & were found negative at 1 year of age.

**Conclusion:** Screening of HBV infection in pregnant females can help clinicians to prevent the infection transmission to the babies by taking appropriate measures. Prevalence rate is low in our study but still screening is highly recommended to reduce the addition of chronic cases annually.

**Keywords:** HBV infection, Antenatal cases, HBV vaccination

### Introduction

Chronic hepatitis B virus (HBV) infection is a major cause of cirrhosis, liver failure & hepatocellular carcinoma. It affects approximately 350 million people worldwide. <sup>(1)</sup> HBV infection is mainly transmitted by blood transfusion, also by vertical transmission from mother to child. This mode of transmission amounts to approximately 50-60% of chronically infected patients. <sup>(2)</sup> Mother to child transmission carries high risk of complications, both for mother & neonate. It increases the maternal morbidity because of decreased immunity. Neonate has got risk of fetal & neonatal hepatitis & can also become a carrier of the disease. This later affects their physical & mental development & has a very high risk of developing chronic liver disease & hepatocellular carcinoma at a younger age. <sup>(1)</sup> It is estimated that approximately 25% patients die because of these complications. <sup>(2)</sup>

The risk of perinatal transmission of HBV infection depends upon various factors. Maternal HBV-DNA levels & HBeAg status of the mother play a crucial role in the perinatal transmission. <sup>(2)</sup> Without HBV immunoprophylaxis, risk of transmission of HBV is 70-90% if the mother is HBeAg positive & it falls to 40% if the mother is HBeAg negative. <sup>(3)</sup> Immunoprophylaxis with both, active & passive prophylaxis reduces the transmission rate to 5%-10% even in HBeAg positive mothers. In contrast high DNA levels increases the transmission rate to 8-32% despite immunoprophylaxis. <sup>(4-6)</sup> Treatment of mothers with high DNA levels during pregnancy &

immunoprophylaxis of the newborn baby significantly reduce the infection rate in the newborn child.

Thus, screening of HBV infection in antenatal cases will be useful to find out the demographics & predisposing factors for the acquisition of infection. The prevalence rate of this infection along with other epidemiological information enables the health planners & programme managers to take the measures for the reduction of the infection rate. Thus it can help to reduce the perinatal transmission rate.

### Materials and Method

A retrospective study was done to study the prevalence rate of Hepatitis B in all pregnant mothers attending the obstetric services in the tertiary care hospital attached to a medical college from May 2015 to May 2016. Further all HBsAg positive cases records were obtained from medical records section & reviewed to collect the data regarding demographics, HBV, HIV serology results, management of the cases pre & post delivery, also if any antiviral treatment given. Medical records were also reviewed to determine HBV immunization, both active & passive prophylaxis of the baby. Also the medical records were analyzed to find out HBsAg status of the baby at the end of 1 year in available cases.

**Data Analysis:** Chi square test was applied to analyse the data derived

## Results

In our study, a total of 3800 antenatal cases were screened for HBV using immunochromatographic test (SD biostandard) & positive cases were further confirmed by ELISA test (Span diagnostics.) A total of 64 cases were positive for Australia antigen. Thus prevalence rate was 1.68%.

Most of the cases were seen in the age group 20-24 years followed by age group 25-29 years as summarized in the Table 1 which is statistically significant. ( $p < 0.001$ )

Table 2 demonstrates equal distribution of the infection in both primigravids as well as multigravids.

Out of 64 cases, 2 cases were tested positive in previous pregnancy whereas remaining were tested positive in current pregnancy as shown in Table 3.

Table 4 shows that all the mothers were poorly educated & most mothers had education up to secondary level.

Out of diagnosed 64 cases, only 14 followed up for the delivery in the hospital. A total of 11 antenatal mothers were delivered by normal labour whereas only 3 delivered by caesarean section. In these, only 1 case had intrauterine death of the baby due to uncontrolled pregnancy associated hypertension.

Table 5 depicts that only 3 babies had low birth weight (<2.5kg) whereas remaining 10 babies had birth weight more than 2.5kg. Thus HBV positive status has no significant impact on the outcome of pregnancy.

All the babies were fully immunised with both active & passive prophylaxis. Only 2 case records were available for testing of HBsAg at the end of 1 year & both the cases were found negative.

**Table 1: Prevalence of HBsAg in relation with the age of pregnant women**

Age group (years)	Number of positive cases
18-19	02
20-24	35
25-29	21
30-34	03
35-39	03
Total	64

**Table 2: Relationship between gravidity & HBV transmission**

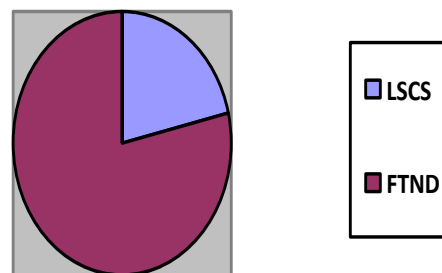
Gravida	Number of positive cases
Primigravida	32
Multigravida	32
Total	64

**Table 3: Relationship between gestational age & HBV prevalence**

Gestational age	Number of positive cases
1 <sup>st</sup> trimester	20
2 <sup>nd</sup> trimester	25
3 <sup>rd</sup> trimester	17
Previous pregnancy	02
Total	64

**Table 4: Relationship between education level & HBV transmission**

Education	Number of positive cases
Illiterate	03
Primary	15
Secondary	28
Pre-university	18
University	-
Total	64



**Fig. 1: Showing the pattern of delivery**

**Table 5: Relationship between weight of the baby & HBV status of the mother**

Weight of the baby at the time of delivery	Number of cases
<2.5Kg	03
>2.5Kg	10
Total	13

## Discussion

Hepatitis B is a global public health problem. HBV is a DNA virus which is mainly transmitted by blood transfusion. Transmission from mother to child is the second most common mode of transmission. Screening of antenatal cases for HBV will help us to identify previously unsuspected chronic HBV infection in young, otherwise healthy individuals; also we can treat infected cases with antiviral therapy. It can also reduce the transmission to the babies born to the infected mothers by taking preventive measures like vaccination, antiviral therapy for the mother. In

addition such screening will help us for a better understanding of the transmission pattern of the disease.

Prevalence of HBV infection varies from region to region. In developing countries, it ranges from 3-20% or higher whereas in developed countries it is lesser.<sup>(7)</sup> Our study showed 1.68% as prevalence rate which is less as compared to other Indian studies. A study by Khakhkhar in 2012<sup>(8)</sup> found 3.07% positivity of HBV in pregnant females whereas Mehta in 2013<sup>(9)</sup> quoted a prevalence rate of 2.9%.

Among non Indian studies, ElShaikh in 2007<sup>(10)</sup> reported a prevalence rate of 5.6% among pregnant females in Sudan. Another study from Nigeria in 2011 reported prevalence of 12.5%.<sup>(1)</sup> However, Kolawole in 2012<sup>(11)</sup> reported 16.5% prevalence in Nigerian population with high incidence in multigravids & in age group of 30-34 yrs. MacLean in 2012<sup>(12)</sup> found a prevalence of 8% among pregnant females from Mali. Molla<sup>(7)</sup> in 2015 found a prevalence of 4.4% with risk factors such as history of dental procedures, multiple sexual partners & home delivery.

Age wise distribution study shows that third decade of life is more susceptible to this infection and most of the cases were seen in the age group 20-24 years followed by 25-29 years age group. Worldwide studies show different age distribution of these cases. Early acquisition of this infection in our study reinforces the trend of early age marriages in India which is still prevalent in some parts of India.

Our study shows equal distribution of the infection in both primigravids as well as multigravids, whereas other studies show more prevalence in multigravids.<sup>(9)</sup> Prevalence in multigravids is more because of increased risk of exposure to infection & multiple deliveries. Our observation of more infection in primigravids as compared to other studies is a matter of concern because more new cases are added to the chronic HBV cases at early age. They act as source of infection for their subsequent pregnancy & for their remaining life. Almost all the cases were from low socio economic status where education is considered as secondary. Hence level of literacy & socio economic condition is inversely proportional to the acquisition of HBV infection. There was no co-association of HIV with HBV infected cases in our study.

Out of diagnosed 64 cases, only 14 cases followed up for the delivery in the hospital. This may be because of the local customs like getting delivered at private hospitals or at maternal place. Out of 14 cases, only 3 cases were delivered by caesarean section. This also shows the taboo about caesarean section also may be the failure or lack of counselling about prevention of transmission of infection to the babies. In these 14 cases, 13 antenatal mothers had live babies whereas only 1 had IUD with accompanied risk factor.

In these 13 babies, only 3 babies had low birth weight (<2.5kg) whereas remaining 10 babies had birth weight more than 2.5kg. Thus HBV positive status has

no significant impact on the outcome of pregnancy. Only 2 babies' cases records were available for testing of HBsAg antigen & both were negative at the end of 1 year. This shows the strict implementation of immunoprophylaxis can decrease the transmission rate to the babies of infected mother. But more number of records should be available to strengthen the fact.

Perinatal transmission occurs in 3 stages. During prenatal period, transplacental leakages, placental infection, ascending infection from vaginal secretions are responsible for transmission of infection. Transplacental leakage in case of HBeAg positive maternal blood is the most common route of HBV intrauterine infection. Amniocentesis increases the transmission because the needle traverses abdominal & uterine wall. Hence it should be carried out with 22 gauge needle. In majority of cases, transplacental infection is the mechanism for intrauterine infection.<sup>(13-15)</sup> Ascending infection because of infected vaginal secretions is another possibility in transmission.<sup>(16)</sup>

In natal period, exposure to maternal secretions & blood is responsible for transmission of virus. Mode of delivery is still a controversial issue in case of HBV infected mothers. Some authors strongly believe in caesarean section in case high maternal viremia<sup>(17)</sup> whereas some believe that the mode of delivery does not influence the rate of transmission if baby is immunised with both active & passive prophylaxis full course.<sup>(18)</sup> In our case, both babies whose hepatitis B records were available were delivered by normal delivery & fully vaccinated.

In the post natal period, breastfeeding doesn't have additional risk for transmission also it does not have any negative impact on HBV vaccination.<sup>(19,20)</sup> Immunization of neonate remains the most important & cost effective step towards prevention of chronic HBV infection.<sup>(21,22)</sup>

In conclusion, to prevent transmission in prenatal period, all the mothers should be screened for HBV infection during their early prenatal visit preferably in first trimester. Also mothers who are not tested during prenatal period should be tested at the time of admission. Operative procedures like amniocentesis should be carried out taking appropriate measures. Mothers with high DNA levels should be treated with antiviral therapy as they carry more chances of transmission despite immunoprophylaxis. Mode of delivery remains a controversial issue. Caesarean section doesn't have any additional advantages over normal delivery if immunoprophylaxis is strictly followed. Thus immunization of neonate remains the most important & cost effective step towards prevention of chronic HBV infection.

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