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**Research Article**

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# Study of Clinical Profile and Fetomaternal Outcomes in Hepatitis B Infection

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## ABSTRACT

**Objective**: To study the prevalence as well as maternal and fetal outcome in pregnant women with hepatitis B infection. **Material and Methods**: A Prospective observational study was conducted in the department of Obstetrics and Gynaecology for a period of 2 years from November 2020-October 2022 in Government Medical College, Aurangabad. This study was done on 190 pregnant women with hepatitis B infection who delivered in our institute. A preset case proforma was used to note all the details about the cases. Socio-demographic profile, obstetric, medical and surgical history, as well as history pertaining to HBV infection and high-risk behaviours was extracted in detail from them. Patients were delivered in special place (septic labor room) to avoid any risk of infection using all aseptic precautions. The maternal and fetal outcomes were noted. **Results**: In our study, the prevalence of hepatitis B infection was found out to be 0.5%. Most common age group in present study was 21-25 (52.63 % cases) years with mean age of 24.37 years.60.52 % cases were from rural area .40.37 % of women had secondary education. 44.73% of the cases were unbooked.53.68% of cases were primigravida with only 1.9 % having a high viral load.75.78% of the cases in our study were asymptomatic, with no identifiable risk factor for transmission in 76.84%.71.05 % of the women did not develop any complications associated with hepatitis B in intrapartum period. 94.73%of women did not develop complications pertaining to Hepatitis B in postpartum period, while 1% of the cases developed hepatic flare. 81.5% women delivered vaginally, while 18.42% of them had a LSCS. Among the 190 babies, 82.10% babies were healthy at birth with a APGAR score of >7 and stayed with their mother, 15.78% babies were admitted in NICU out of which 7.36 % were preterm. **Conclusion**: Hepatitis B infection during pregnancy is asymptomatic most of the times, however routine screening of all pregnant women will help in detection of this infection. This infection adversely affects some pregnant females, and also has chances of perinatal transmission. So, appropriate measures should be undertaken to reduce the adverse maternal and neonatal outcomes.

**Key Words**: *Hepatitis B infection, fetomaternal outcome*

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## INTRODUCTION

Hepatitis B virus infection occurs globally and constitutes a major public health problem[1]. The prevalence of HBsAg in gravid women alters with geographical location and ethnicity. In endemic areas such as China and South East Asia, it may as high as 10-20%[2].

Prevalence of Hepatitis B in pregnant women worldwide is 2.5 to 1.5%, Whereas in India it is 0.2 to 7.7%[3]. Hepatitis B in pregnant women leads to gestational hypertension, preterm labour, meconium-stained liquor or may result in normal delivery. HBV-related liver diseases are responsible for approximately 800 000 deaths annually[4]. Before HBV vaccine was integrated into routine immunization program, proportion of babies becoming HBV carriers was roughly 10-30% for mothers who were HBsAg positive[5-7].

Prevention of perinatal transmission remains an imperative target in the struggle for global eradication of HBV infection[7].All types of viral hepatitis during pregnancy are associated with a high risk of maternal complications, high rate of vertical transmission (causing fetal and neonatal hepatitis) and is a leading cause of maternal mortality[8].

It is vital for obstetricians to determine its morbidity and mortality, effect on parturition and transmission of infection to the new-born, to formulate preventive strategies. Government of India has launched a program known as NATIONALVIRAL HEPATITIS CONTROL PROGRAM. This programme is implemented in our tertiary care institute as well, to screen patients with hepatitis infections and provide them appropriate treatment and care. With a high proportion of HBsAg positive deliveries as well as adverse pregnancy outcomes, this study was undertaken to know the

incidence of this disease so as to undertake appropriate measures to prevent the perinatal transmission as well as other complications.

**OBJECTIVES:**

1. To study the prevalence of Hepatitis B in pregnancy.
2. To study the maternal outcome.
3. To study the perinatal outcome.

**MATERIAL & METHODS:**

This was a prospective observational study conducted in the department of Obstetrics and Gynecology, Government medical college, Aurangabad. Duration of this study was from November 2020-October 2022. This study was carried out after approval by institutional ethical committee. Pregnant women in age group 18 -45 years meeting the inclusion criteria, with gestational age of > 28wks having been registered in this hospital, as well as those referred to our hospital were included in the present study. About 2 ml of venous blood was collected from each individual under strict aseptic precautions and subjected to Rapid Immunochromatography test (MAKESURE kits) with a sensitive range of 0.5 ng/ml to detect the presence of HBsAg. Manufacturer's instructions were followed during the test procedure, seraw as separated by centrifugation. They were then tested for Hepatitis B surface antigen (HbsAg) by Enzyme linked Immunosorbent assay (ELISA).

Routine follow up of antenatal patients beyond 28 weeks at 15 days interval and weekly after 36 weeks of gestation. Viral load was calculated using the PCR-technique (3 cycles of PCR done). Pregnant women with high viral load (>200,000 IU/mL) were referred to a specialist (appointed under National Virus Hepatitis Control Programmer) to discuss consideration of tenofovir between 28-32 weeks to reduce the risk of perinatal transmission. Serological status of the subjects and correlation with their socio-economic characteristic was noted using a preset case proforma. Socio-demographic profile, reproductive, medical and surgical history, as well as history pertaining to HBV infection and high-risk behaviours was extracted in detail from them. Patients were delivered in special place (septic labor room) under all aseptic precautions to avoid any risk of infection. Universal precautions were taken byobstetrician while delivering the patient like use of Gloves, Mask, Apron, face shield. The maternal and fetal outcomes were noted. Mothers were counselled about postpartum care like maintaining perineal hygiene, breastfeeding practices, baby immunization. Contraceptive counselling was done at the time of discharge.

Data of the selected cases was analysed using SPSS Software version 20. On analysis of data, observations were noted and tables were formulated.

**RESULTS:**A total of 190 cases were studied.

**Table no.1**- Distribution of socio-demographic features.

| PARAMETERS | CASES | PERCENTAGE |
|---|---|---|
| MATERNAL AGE | | |
| ≤20 | 35 | 18.42% |
| 21-25 | 100 | 52.63% |
| 26-30 | 40 | 21.05% |
| 31-35 | 6 | 3.15% |
| >35 | 9 | 4.73% |
| RESIDENCE | | |
| Urban | 75 | 39.47% |
| Rural | 115 | 60.52% |
| BOOKING STATUS | | |
| Booked | 105 | 55.26% |
| Unbooked | 85 | 44.73% |
| GRAVIDA STATUS | | |
| Primigravida | 102 | 53.68% |
| G2-G4 | 83 | 43.68% |
| ≥G5 | 5 | 2.63% |

Among 190 cases, 100 cases were from age group 21-25 years (52.63%). The mean age is 24.37 years. 60.52% cases were from rural area. This can be because in rural areas no facilities are available for the delivery of these patients, so maximum cases are referred from these areas to tertiary care centres. 55.26% cases were booked and had a regular antenatal checkup. These women were screened for HbsAg at their first ANC visit and further were subjected to viral load testing during their 3$^{rd}$ trimester (28-32 weeks). In present study, most of the women (53.68%) were primigravida.44.73% of the cases were detected at and above 36 weeks of gestation. 17.89% cases presented with abdominal pain, 2.10% with nausea and vomiting and 75.78% cases were asymptomatic. 76.84% cases did not give any history of blood transfusion, tattooing, etc while 10.52% gave H/O intravenous injections.

**Table no 2**- Distribution of cases according to complications associated with Hepatitis Binfection.

| complications associated with Hepatitis B | no of cases (n=190) | Percentage |
|---|---|---|
| PROM | 20 | 10.52% |
| Anemia | 10 | 5.26% |
| Gestational Diabetes Milletus | 6 | 3.15% |
| HDP | 18 | 9.47% |
| Congenital Abnormalities | 1 | 0.52% |
| None | 135 | 71.05% |

Among 190 women, 135 (71.05%) women did not develop any complications due to hepatitis. 10.52% women had PROM which is considered to be one of the complication due to hepatitis, 3.15% had GDM while 9.47% of them developed hypertensive disorder of pregnancy. Only 1 woman had baby with congenital abnormality which cannot be attributed to hepatitis.

In our study, among 190 cases 10.61% of cases had a preterm delivery. 35 women had a LSCS and 155 women had normal delivery. LSCS was done only for obstetric indications.

3.15% of patients had raised bilirubin and 1.05% of them developed PPH during delivery. 53.68% of babies had birth weight between 2.5-2.999 kgs. 21.04% babies had birth weight <2.5 kgs.

**Table no 3**- Distribution of cases according to maternal outcomes.

| MATERNAL OUTCOMES | Cases | Percentage |
|---|---|---|
| No complications | 180 | 94.73% |
| Hepatic decompensation/ failure | 0 | 0 |
| Hepatic flare | 2 | 1.05% |
| Infection during C-section | 8 | 4.21% |

Among 190 women, 180 (89.47%) had no complications during delivery or even in the postpartum period. Among women who underwent LSCS, 4.21% women developed wound-infection. This can be because hepatitis reduces the immunity in already immune-compromised pregnant patients.

**Table no 4**- Distribution of cases according to neonatal outcomes

| NEONATAL OUTCOME | | no of cases | Percentage |
|---|---|---|---|
| Baby with mother | | 156 | 82.10% |
| Still birth | | 4 | 2.10 % |
| NICU admission (n=30) | Low birth weight | 10 | 5.26% |
| | Preterm | 14 | 7.36 % |
| | Birth asphyxia | 6 | 3.15 % |

Out of 190 cases, babies born to 156 women were healthy babies, 30 babies had to be admitted in NICU. There were 4 stillbirth and 1 baby died after delivery at day 2 due to perinatal asphyxia. Among 4 stillbirths, the causes for stillbirth were cord prolapse, Abruptio placenta, antepartum eclampsia.

**DISCUSSION**

The primary objective of this study was to determine the prevalence of HBsAg among pregnant women as well as to study the impact of these infections during pregnancy. During the 2year study from November 2020 to October 2022, a total of 37866 deliveries were conducted. Of them 190 cases were found to be positive for Hepatitis B. The

seroprevalence of HBsAg of 0.5 % was reported in the present study.The prevalence of Hepatitis B during pregnancy is 0.83% in Mehta K et al[9] study,1.02% in the study conducted by Satpathy et al[10] and 0.36 % in study by Elkhateeb et al. The prevalence rate of Hepatitis B is found to be 3.3% in Sun et al study which is more than that found in other studies. This may be because the prevalence of HbsAg is more among the Chinese population as neonatal infection and horizontal transmission during childhood are still most common routes of transmission. The variation may be attributed to difference in geographical location or in the detection process.

In the present study, the commonest age group of study participants was 21-25 years and the mean age was 24.37 years, this was consistent with study conducted by Mehta K et al[9]. Han et al[11] studied Clinical features and outcome of Acute Hepatitis B in pregnancy and observed most women were in the age group of 21-28 years with a mean age of 22.7 years. Sibia et al[12] observed the majority of study population to be 25-30 years which was consistent with the study by Bittaye et al[13].

Most of the cases i.e 60.52 % of present study were from rural area and 39.47 were from urban area. Han et al[11], Fekry et al observed that 9.1% and 25% respectively were from urban area and 90.9% and 75% were from rural area. These results matched with the present study.

In the present study, 55.26% of the subjects were booked and 44.73% were unbooked. All the booked cases in our institute were diagnosed during routine antenatal screening and had a minimum of 4 visits during their antenatal period. Whereas Katke RD[14], Mishra et al[15] found that 91.5%, 84.6% of the cases were booked respectively and 8.5%, 15.38% were unbooked.

The present study showed that maximum cases were primigravida (53.68%), while 43.68% cases were multigravida, 2.63% were ≥G5. Present study finding matches with Katke RD[14] study. In Sathpaty et al[10] study, 57% cases were primigravida, 35.36% cases were multigravidas while 7.64% subjects were ≥G5.

In our present study, majority of patients had no symptoms while, 6.31% came with the complaint of malaise, 1.57% of women had jaundice and 1.09% patients had fever. In comparison to this, study conducted by Han et al had majority of patients with jaundice (95.4%) and anorexia was the second most common complain. Women did not present with any other complaints which were seen in present study.

The incidence of vaginal delivery is 71.1%, 66.67% and 61.17% in studies conducted by Katke RD[14], Mishra S et al[15] and Sathpathy et al[10] respectively while that of LSCS is 28.9%, 33.33% and 38.82% respectively. Present study has the findings similar to these studies where the incidence of vaginal delivery is higher than LSCS.

The incidence of term babies i.e babies born after 37 completed weeks of gestation is 86.31 % in present study and that of preterm babies (born before 37 completed weeks) is 13.68%. The incidence of early preterm (28-34) is 3.15% while late preterm is 10.53%

The incidence of babies born at term is 95.23% and 92.5% in studies by Katke RD[14] and Zheng et al respectively. On the other hand, the incidence of preterm babies is 4.76% and 7.5% respectively. In the study by Zheng et al, 1.6% are early preterm babies and 5.9% are late preterm

The complications seen in present study are PROM which is seen in 10.52% of women, HDP in 9.47% of women, Anaemia is seen in about 5.26% of women while gestational diabetes is seen in 3.15% of HbsAg positive pregnant females in our study. Maximum women (71.05%) had their antepartum, intrapartum and postpartum period uneventful as no complication was developed in them.In the study by Katke RD[14], 60% of the women did not have any complication, 9% of the cases had PROM while 4.4% of them had anaemia. In the Zheng et al[16] study, 28.2 % of cases had PROM, 16.1% developed gestational diabetes milletus while 4.1% of the women had hypertensive disorder of pregnancy.
The neonatal outcomes are discussed in following table.

**Table 5-**: Comparison of fetal outcome in various studies

| | Katke RD | Mishra et al | Present study |
|---|---|---|---|
| Baby with mother | 90.5% | 89.74% | 82.10% |
| NICU admission | 7.1% | 10.26% | 15.77% |
| Still birth | 2.4% | 2.56% | 2.10% |

In the present study, out of the total babies born, majority of the babies (82.10%) stayed with mother after birth. Breastfeeding was initiated in them as studies suggests that it does not increase the chances of vertical transmission of Hepatitis B. In present study, 30 babies were admitted in NICU i/v/o low birth weight, prematurity, birth asphyxia some of which required assisted ventilation. In the study conducted by Katke RD[14], 7.1% of the babies required NICU admission and 2.4% were stillborn. All the NICU admissions were for respiratory distress.

In the study of Mishra et al[15], 89.74% of the babies stayed with mother at birth and 10.26% required NICU admission.

## CONCLUSION

This study found a low prevalence of HBV infection in pregnant women under study population. Young females from rural areas having only school education and low socio-economic status who could not even complete the recommended schedule of antenatal care were found to be more positive and therefore need to be taken care of. The possible associated factors during ANC include HDP, GDM and anemia. The infection affected newborns in the form of low birth weight, low APGAR score and stillbirth. The rate of NICU admission was high. We recommend, screening of all pregnant women for HBV infection irrespective of their symptoms and risk factors. Making pregnant women more and more aware of it is the need of this hour!

## ABBREVIATIONS:

LSCS - Lower Segment Caesarean Section, NICU - Neonatal Intensive Care Unit, ANC - Antenatal care, PPH - Postpartum haemorrhage, HBV-Hepatitis B infection, APGAR- Appearance Pulse Grimace Activity Respiration, PROM- Premature Rupture of Membranes, GDM- Gestational Diabetes Milletus, HDP- Hypertensive Disorders of Pregnancy.

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**Authors' contributions:**

Dr. Aishwarya Chandwade developed the study proposal, managed the research implementation, data collection, analyzed data and wrote the manuscript. Dr. Vijay Kalyankar developed the study proposal, assisted with data analysis and reviewed the manuscript. Dr. Shrinivas gadappa assisted with development of the study proposal, reviewed preliminary results and reviewed the final manuscript. Dr. Dhanashri Patil participated in development of the study proposal, participated in research team meetings to monitor study progress. All authors have read and approved the manuscript.

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