Section: Obstetrics and Gynaecology

Original Research Article

# HEPATITIS B COMPLICATING PREGNANCY AND ITS FETOMATERNAL OUTCOME: A PROSPECTIVE OBSERVATIONAL STUDY

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## ABSTRACT

**Background:** B virus (HBV) infection during pregnancy remains a significant public health concern, particularly in developing countries, due to its potential impact on maternal and neonatal outcomes and the risk of vertical transmission. We evaluated maternal and fetal outcomes among pregnant women with hepatitis B infection and to assess the association between maternal comorbidities and neonatal outcomes. **Materials and Methods:** This prospective observational study was conducted at a tertiary care teaching hospital in Tamil Nadu from January 2020 to January 2021. Fifty HBsAg-positive pregnant women with singleton pregnancies were enrolled. Maternal clinical profile, obstetric outcomes, and neonatal outcomes were recorded. Internal comparison between maternal comorbidities and neonatal outcomes was performed using Fisher's exact test. **Result:** The incidence of hepatitis B complicating pregnancy was 0.4%. Most women were aged 21–25 years (46%), and 52% were primigravidae. Associated comorbidities were present in 34% of cases. Vaginal delivery occurred in 66%, and caesarean section in 34%. Among neonates, 90% were term births, 10% were preterm, 10% had low birth weight, and 10% required NICU admission. On internal comparison, NICU admission was significantly higher among neonates born to mothers with comorbidities ($p = 0.04$), while preterm birth and low birth weight were not significantly associated. **Conclusion:** Hepatitis B infection alone was not associated with adverse pregnancy outcomes when managed appropriately. Maternal comorbidities played a significant role in determining neonatal morbidity.

## INTRODUCTION

Hepatitis B virus (HBV) infection remains a major global public health challenge, with over two billion individuals infected worldwide and approximately 350 million chronic carriers, contributing significantly to chronic liver disease and hepatocellular carcinoma.[1,2] Vertical transmission plays a critical role in sustaining the burden of hepatitis B, particularly in regions with intermediate to high endemicity.

India is classified as an intermediate endemic zone for hepatitis B, with reported HBsAg prevalence among pregnant women ranging from 0.5% to 5%.[3,4] Pregnancy therefore offers a crucial opportunity for screening, early diagnosis, and prevention of long-term disease transmission.

Physiological and immunological adaptations during pregnancy influence the natural course of HBV infection. Immune tolerance during pregnancy may lead to increased viral replication with relatively stable liver enzyme levels, whereas postpartum immune reconstitution can result in hepatitis flares.[5] Despite these changes, most women with chronic hepatitis B tolerate pregnancy well in the absence of advanced liver disease.

The effect of hepatitis B infection on maternal outcomes remains controversial. Some studies have reported associations with gestational diabetes mellitus, hypertensive disorders, and anemia, while others have found no significant increase in adverse maternal outcomes.[6–8] These inconsistencies may be related to differences in viral load, HBeAg status, and antenatal care practices.

Fetal and neonatal outcomes associated with maternal HBV infection have also been variably reported. While some studies suggest increased risks of preterm birth and low birth weight, others report outcomes comparable to the general obstetric population.[9,10] The most important concern remains mother-to-child transmission, which may reach 70–90% in HBeAg-positive mothers without prophylaxis.[6,11]

Universal antenatal screening and timely neonatal immune-prophylaxis with hepatitis B vaccine and hepatitis B immunoglobulin (HBIG) within 24 hours

of birth can reduce vertical transmission by up to 95%.[12,13] However, challenges such as late booking, referral delays, and lack of viral load testing persist in resource-limited settings.

This prospective study was conducted to evaluate the feto-maternal outcomes of hepatitis B complicating pregnancy in a tertiary care hospital in Tamil Nadu and to identify factors influencing neonatal outcomes.

## MATERIALS AND METHODS

**Study Design and Setting:** This is a hospital-based prospective observational study conducted in the Department of Obstetrics and Gynaecology, Government Mohan Kumaramangalam Medical College and Hospital, Salem, Tamil Nadu.

**Study Period:** The study was done from January 2020 to January 2021.

**Study Population:** Fifty HBsAg-positive pregnant women with singleton pregnancies.

**Inclusion Criteria**

Those with HBsAg positivity confirmed by ELISA test. Those who give informed consent were added in the study.

**Exclusion Criteria**

Those with HBsAg-negative. Those with multiple pregnancies and those who refusal to participate.

**Data Collection:** Maternal demographic details, obstetric profile, comorbidities, laboratory parameters, mode of delivery, and neonatal outcomes were recorded using a structured proforma. Mothers and neonates were followed until discharge.

**Statistical Analysis:** Descriptive statistics were used. Internal comparison between maternal comorbidities and neonatal outcomes was performed using Fisher's exact test. A p-value <0.05 was considered statistically significant.

**Ethical Approval:** Institutional Ethics Committee approval was obtained.

## RESULTS

**Table 1: Age distribution of study participants in the maternal and fetal outcomes of hepatitis B infection during pregnancy in a tertiary care Hospital in Tail Nadu**

| S. No | Age group (in years) | Number (n = 50) | Proportion (%) |
|---|---|---|---|
| 1 | < 20 | 10 | 20 |
| 2 | 21 – 25 | 23 | 46 |
| 3 | 25 – 30 | 17 | 34 |

Most women belonged to the 21–25-year age group, reflecting the common reproductive age group attending antenatal services.

**Table 2: Obstetric profile of study participants in the maternal and fetal outcomes of hepatitis B infection during pregnancy in a tertiary care Hospital in Tail Nadu**

| Parity | Number | Percentage |
|---|---|---|
| Primigravida | 26 | 52% |
| Multigravida | 24 | 48% |

Over half of the women were primigravidae, indicating early detection through routine antenatal screening.

**Table 3: Associated co-morbidities of study participants in the maternal and fetal outcomes of hepatitis B infection during pregnancy in a tertiary care Hospital in Tail Nadu**

| Status | Number | Percentage (%) |
|---|---|---|
| Gestational diabetes mellitus | 6 | 12.0 |
| Gestational hypertension | 4 | 8.0 |
| Anemia | 4 | 8.0 |
| Hypothyroidism | 2 | 4.0 |
| Seizure disorder | 1 | 2.0 |
| No associated comorbidity | 33 | 66.0 |

Gestational diabetes mellitus was the most frequently observed comorbidity, affecting 12% of the study population, followed by gestational hypertension and anemia, each present in 8% of women. Hypothyroidism and seizure disorder were less common. The predominance of gestational diabetes mellitus and hypertensive disorders reflects the background prevalence of these conditions in the antenatal population and underscores the importance of comprehensive antenatal screening and management in women with hepatitis B infection. Note: Some participants had more than one comorbidity; therefore, individual comorbidity frequencies may overlap.

**Table 4: Mode of delivery of study participants in the maternal and fetal outcomes of hepatitis B infection during pregnancy in a tertiary care Hospital in Tail Nadu.**

| Mode | Number | Percentage (%) |
|---|---|---|
| Vaginal | 33 | 66 |
| Caesarean section | 17 | 34 |

Vaginal delivery was the predominant mode of delivery in the study population, accounting for 66% of cases, while 34% of women underwent caesarean section. Caesarean deliveries were performed for


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standard obstetric indications, and hepatitis B infection alone did not influence the choice of mode of delivery.

**Table 5: Neonatal outcomes of study participants in the maternal and fetal outcomes of hepatitis B infection during pregnancy in a tertiary care Hospital in Tail Nadu.**

| Mode | Number | Percentage (%) |
|---|---|---|
| Term birth | 45 | 90 |
| Preterm birth | 5 | 10 |
| Low birth weight | 5 | 10% |
| NICU admission | 5 | 10% |

The majority of neonates were born at term (90%). Preterm birth and low birth weight were observed in 10% of cases each. Ten percent of neonates required neonatal intensive care unit admission, and no perinatal mortality was recorded, indicating overall favorable neonatal outcomes in the study population.

**Table 6: Association between maternal co-morbidities and neonatal outcomes of study participants in the maternal and fetal outcomes of hepatitis B infection during pregnancy in a tertiary care Hospital in Tail Nadu.**

| Neonatal outcome | Comorbidity present (n=17) | Comorbidity absent (n=33) | p-value* |
|---|---|---|---|
| Preterm birth | 3 (17.6%) | 2 (6.1%) | 0.21 |
| Low birth weight | 3 (17.6%) | 2 (6.1%) | 0.21 |
| NICU admission | 4 (23.5%) | 1 (3.0%) | 0.04 |

Neonatal adverse outcomes were more frequent among mothers with associated comorbidities. Neonatal intensive care unit admission was significantly higher in the comorbidity group compared to those without comorbidities (23.5% vs 3.0%; p = 0.04). Although preterm birth and low birth weight were numerically higher among women with comorbidities, these differences did not reach statistical significance. This finding suggests that maternal comorbid conditions contribute more to early neonatal morbidity than hepatitis B infection alone.

## DISCUSSION

The incidence of hepatitis B complicating pregnancy in this study (0.4%) is comparable to other Indian hospital-based studies, reaffirming India's intermediate endemic status.[3,11] Most women were young and primigravid, emphasizing the effectiveness of routine antenatal screening.

Approximately one-third of the women had associated medical or obstetric comorbidities. Internal comparison revealed that NICU admission was significantly higher among neonates born to mothers with comorbidities, highlighting the role of coexisting conditions rather than hepatitis B infection alone in determining neonatal morbidity. Similar observations have been reported in previous studies.[7,9]

Gestational diabetes mellitus was the most frequently observed comorbidity in the present study. This finding is consistent with several studies that have reported a higher prevalence of glucose intolerance among pregnant women with hepatitis B infection, possibly related to altered hepatic metabolism and insulin resistance, although a direct causal relationship remains unproven.[14,15] Other large population-based studies have suggested that the coexistence of hepatitis B infection and gestational diabetes mellitus may reflect the high baseline prevalence of glucose intolerance in the antenatal population rather than a virus-specific effect.[17]

Hypertensive disorders of pregnancy and anemia were the next most common comorbidities observed. Similar findings have been reported in hospital-based studies from India and other Asian countries, where these conditions remain prevalent due to nutritional factors, socioeconomic determinants, and access to antenatal care.[16] Current evidence does not consistently demonstrate a direct association between hepatitis B infection and hypertensive disorders of pregnancy, a finding that is supported by the results of the present study.[7,17]

Hypothyroidism and seizure disorders were observed less frequently. Available literature does not suggest a significant association between chronic hepatitis B infection and thyroid dysfunction or seizure disorders, indicating that their occurrence in the present study is likely incidental.[18] Importantly, internal comparative analysis demonstrated that the presence of maternal comorbidities, irrespective of type, was significantly associated with increased neonatal intensive care unit admission. This finding reinforces existing evidence that adverse neonatal outcomes are more closely related to coexisting maternal conditions than to hepatitis B infection alone.[7,9]

Only a small proportion of women exhibited elevated liver enzymes, and none developed hepatic decompensation. This aligns with earlier studies indicating that pregnancy is generally well tolerated in women with chronic hepatitis B in the absence of advanced liver disease.[5,19]

Vaginal delivery was the predominant mode of birth. No significant neonatal benefit was observed with caesarean delivery, supporting existing evidence that elective caesarean section is not indicated solely for hepatitis B positivity when neonatal immune-prophylaxis is ensured.[6,10]

Neonatal outcomes were largely favourable, with low rates of preterm birth, low birth weight, and NICU


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admission. The absence of perinatal mortality further underscores the effectiveness of institutional delivery and early neonatal care.

**Limitations:** It is a small sample size single-center study. The absence of viral load and HBeAg testing and short neonatal follow-up could have been avoided.

## CONCLUSION

Hepatitis B complicating pregnancy was associated with favourable maternal and neonatal outcomes when comprehensive antenatal care, institutional delivery, and neonatal immune-prophylaxis were ensured. The infection alone did not significantly influence pregnancy outcomes; however, maternal comorbidities were associated with increased neonatal morbidity, particularly NICU admission.

**Recommendations:** Universal antenatal screening for hepatitis B should be strictly implemented. HBsAg-positive pregnant women should receive appropriate counselling, monitoring, and postpartum follow-up. Neonatal immune-prophylaxis with hepatitis B vaccine and HBIG must be ensured for all exposed infants. Incorporation of maternal viral load testing into antenatal protocols may further reduce vertical transmission.

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