ORIGINAL RESEARCH PAPER
Volume - 14 | Issue - 07 | July - 2025 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

AN OBSERVATIONAL COHORT STUDY ON THE CLINICAL COURSE AND NEONATAL OUTCOMES IN PREGNANT WOMEN DIAGNOSED WITH VIRAL HEPATITIS

Obstetrics & Gynaecology

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ABSTRACT

Background: Viral hepatitis continues to be a major global health concern during pregnancy, particularly in regions with high endemicity of hepatitis B and hepatitis C. It can range from asymptomatic mild elevations in liver enzymes to fulminant hepatic failure, posing substantial risks for both the mother and the fetus. This study is directed to the assessment of the clinical presentations, laboratory findings, and neonatal outcomes in pregnant women diagnosed with viral hepatitis, including those concurrently affected with intrahepatic cholestasis of pregnancy (IHCP). **Methods:** This prospective observational study was conducted over one year in a tertiary care hospital. Out of the 164 pregnant women presenting with clinical or biochemical signs of liver dysfunction, 54 had isolated viral hepatitis and 22 had both viral hepatitis and IHCP. Data on demographics, virological markers (HBsAg, anti-HCV), obstetric interventions, and neonatal outcomes were gathered. Statistical comparisons focused on maternal complications and neonatal parameters in women with only viral hepatitis versus those with concurrent IHCP. **Results:** Seventy-six women (46.3%) were diagnosed with viral hepatitis, of whom 26.8% were HBsAg-positive and 18.9% were HCV-positive. While most displayed nonspecific gastrointestinal symptoms, the presence of IHCP significantly heightened maternal risk, culminating in more frequent cesarean delivery (81.8%), elevated preterm labor (59.1%), and a higher incidence of NICU admissions (59.1%). In the isolated viral hepatitis group, the live birth rate was 96.3%, contrasting with 81.8% in the viral hepatitis with concomitant IHCP subgroup, which also showed increased rates of stillbirth (13.6%) and intrauterine fetal demise (4.5%). **Conclusion:** Viral hepatitis in pregnancy raises considerable concerns for maternal morbidity and neonatal complications, and coexisting IHCP amplifies these risks. Comprehensive prenatal screening, timely antiviral intervention when indicated, and coordinated obstetric-hepatology management are crucial strategies to alleviate the global burden of maternal-fetal hepatitis.

KEYWORDS

Viral Hepatitis, Pregnancy, Hepatitis B, Hepatitis C, Neonatal Outcomes, Maternal Morbidity

INTRODUCTION

Viral hepatitis is a pressing global challenge in obstetrics, especially in regions with a high prevalence of Hepatitis B (HBV) and Hepatitis C (HCV) (1,2,3). Chronic HBV is estimated to affect several hundred million individuals worldwide, and maternal-to-child transmission is a critical driver of new infections, particularly in cases where mothers test positive for the hepatitis B e-antigen (HBeAg). Vertical transmission rates can exceed 90% in such scenarios, contributing significantly to the global reservoir of chronic HBV (4). Concurrently, HCV also poses substantial perinatal risks, with vertical transmission rates reported between 5% and 15%, influenced by factors such as maternal viral load and delivery methods (5). HCV infection is an increasing health and economic burden in adults as well as children, in both developing and developed countries.(6)

While many pregnant women with HBV or HCV present with only mild laboratory abnormalities, a subset can experience severe liver dysfunction, potentially compromising fetal well-being (2,3). Moreover, viral hepatitis can coincide with other pregnancy-specific hepatic disorders like Intrahepatic Cholestasis of Pregnancy (IHCP), characterized by pruritus, elevated bile acids, and possible adverse fetal outcomes (7). When viral hepatitis overlaps with IHCP, the maternal-fetal risks may compound, resulting in earlier deliveries, a higher likelihood of operative interventions, and possibly increased neonatal morbidity. Although no causality effect can be claimed, ICP was associated with an increase in the risk of developing hepatobiliary diseases later in life, such as cirrhosis, gallstones (8).

The presence of Hepatitis E in pregnancy increases the chances of complications such as antepartum hemorrhage (APH), postpartum hemorrhage (PPH), preterm labor, preterm premature rupture of membrane (PPROM), maternal coagulopathy, and intrauterine fetal death (IUFD).(9)

Geographic disparities also shape clinical outcomes. In resource-limited settings, the absence of systematic antenatal screening and restricted antiviral access can amplify vertical transmission rates, escalate maternal complications, and perpetuate community-level infection (2,3). In an ongoing pregnancy, HBsAg level is a more stable parameter than viral load, and is also cheaper. Therefore, HbsAg levels can be recommended as a predictor of the vertical transmission of HBV infection, especially in a resource-limited setting(10).In more affluent settings, routine HBV vaccination and targeted antiviral therapy for mothers with significant viremia have been shown to substantially reduce vertical transmission and improve obstetric outcomes (4,11).

Despite progress in vaccination and antiviral approaches, critical knowledge gaps persist regarding the intersection of viral hepatitis and IHCP, where robust data on maternal and neonatal outcomes remain limited. Consequently, this study addresses the clinical course, laboratory findings, and perinatal outcomes in pregnant women presenting with viral hepatitis alone compared to those concurrently diagnosed with IHCP. By elucidating these differences, we aim to enhance clinical strategies for early detection, intervention, and management to optimize both maternal and neonatal prognoses in cases of viral hepatitis during pregnancy.

MATERIALS AND METHODS

Study Design

A prospective observational study was performed over a duration of one year at a tertiary teaching hospital. Ethical clearance was granted by the institutional review board, and all participants provided written informed consent.

Participants

Inclusion Criteria

- Pregnant women (any age, any gestational period) testing positive for viral hepatitis markers (HBsAg or anti-HCV)
- Accompanying abnormal liver function tests
- Documented IHCP (pruritus, elevated bile acids) where present, falling under a combined category

Exclusion Criteria

- Pre-existing cirrhosis, autoimmune hepatitis, or metabolic liver disease diagnosed before conception
- Insufficient clinical or laboratory data

Data Collection
Researchers recorded patient demographics, obstetric history, and relevant comorbid conditions. Physical examinations screened for jaundice, edema, or hepatic encephalopathy. Laboratory evaluations included complete blood counts (CBC), liver function tests, coagulation profiles, and serologic tests for HBsAg, HBeAg, and anti-HCV. Ultrasound and Doppler studies assessed fetal well-being and amniotic fluid volume.

Outcome Measures
1. Maternal Outcomes
o Mode of delivery (normal vaginal delivery vs. cesarean)
o Preterm labor, postpartum hemorrhage (PPH), transfusion needs, ICU admissions, and maternal mortality
2. Neonatal Outcomes
o Live births, stillbirths, intrauterine fetal demise (IUD), birth weights, Apgar scores, NICU admissions, and early neonatal deaths

Statistical Analysis
Continuous data were described as mean ± standard deviation (SD), while categorical variables were presented as percentages. Chi-square tests were employed for group comparisons: (1) Viral hepatitis only, and (2) Viral hepatitis + IHCP. A p-value <0.05 was considered statistically significant.

RESULTS

Population Characteristics (Table 1)
A total of 164 pregnant women with clinical or biochemical evidence of liver dysfunction were screened, of whom 76 (46.3%) had a confirmed diagnosis of viral hepatitis. Within this group:
- Isolated Viral Hepatitis: 54 (32.9%)
- Viral Hepatitis + IHCP: 22 (13.4%)

Overall, 44 (26.8%) participants were HBsAg-positive, and 31 (18.9%) tested positive for HCV. The mean maternal age was 26.5 ± 5.1 years. Approximately half were multigravida.

Table 1. Selected Baseline Features of Viral Hepatitis Subgroups

Variable	Viral Hepatitis Only (n=54)	Viral Hepatitis + IHCP (n=22)
Mean Age (years)	26.1 ± 4.8	27.0 ± 5.4
Gravida ≥2	25 (46.3%)	11 (50.0%)
GI Symptoms (e.g., nausea)	32 (59.3%)	4 (18.2%)
Pruritus	1 (1.9%)	8 (36.4%)
Elevated ALT/AST (>70 U/L)	42 (77.8%)	21 (95.5%)

Clinical Course
- **Viral Hepatitis Only:** Typically presented with mild-to-moderate enzyme elevations and nonspecific symptoms like nausea or malaise. A small fraction (3.7%) required ICU care, largely due to coexisting complications such as preeclampsia or postpartum hemorrhage.
- **Viral Hepatitis + IHCP:** Marked by more severe pruritus (36.4%), notable bile acid derangements, and higher coagulopathy risk.

Delivery and Maternal Outcomes (Table 2)
Overall, 62.2% of the participants underwent cesarean section. Distribution by subgroup:
- Viral Hepatitis Only: 44.4% cesarean deliveries
- Viral Hepatitis + IHCP: 81.8% cesarean deliveries, often for acute fetal distress or severe cholestasis

Blood transfusions were required in 72.7% of women with concurrent IHCP, and 77.3% experienced prolonged hospitalizations. ICU admissions were noted in 13.6% of these combined cases. No maternal deaths were documented.

Table 2. Maternal Outcomes

Parameter	Viral Hepatitis Only (n=54)	Viral Hepatitis + IHCP (n=22)
Cesarean Delivery	24 (44.4%)	18 (81.8%)
Blood Transfusion Needed	12 (22.2%)	16 (72.7%)
Prolonged Hospital Stay	17 (31.5%)	17 (77.3%)
ICU Admissions	2 (3.7%)	3 (13.6%)
Maternal Mortality	0 (0%)	0 (0%)

Neonatal Outcomes (Table 3)
Preterm delivery (<37 weeks) was observed in 16.7% of isolated viral hepatitis cases versus 59.1% in those with coexisting IHCP (p<0.01). Stillbirth was reported in 1.9% of the former group compared to 13.6% of the latter, and an additional 4.5% intrauterine fetal demise was recorded in the combined group. Live birth rates were correspondingly 96.3% and 81.8%.

Table 3. Neonatal Outcomes

Parameter	Viral Hepatitis Only (n=54)	Viral Hepatitis + IHCP (n=22)
Preterm Birth	9 (16.7%)	13 (59.1%)
Stillbirth	1 (1.9%)	3 (13.6%)
IUD	0 (0%)	1 (4.5%)
Live Birth Rate	52 (96.3%)	18 (81.8%)
NICU Admissions	28 (51.9%)	13 (59.1%)

Primary NICU admissions were attributed to respiratory distress, suspected meconium aspiration, and low birth weight.

DISCUSSION

The wide prevalence of viral hepatitis in our cohort confirms its status as a leading cause of maternal liver disease, aligning with global data on the substantial burden posed by hepatitis B and C in pregnant populations (1,7). Our findings further reveal that coexisting intrahepatic cholestasis of pregnancy (IHCP) can exacerbate these viral-induced hepatic injuries, leading to higher rates of preterm delivery, cesarean section, and neonatal intensive care admissions (8). Geographically, resource-constrained settings experience greater vertical transmission and maternal complications, while systematic screening and antiviral prophylaxis in high-income regions can markedly mitigate these adverse outcomes (9,10,4,11). In this study, the elevated frequency of preterm deliveries in the viral hepatitis + IHCP group likely stems from an iatrogenic decision to deliver early when confronted with severe cholestasis and potential fetal compromise.

Although universal antiviral therapy is not obligatory for all HBV- or HCV-positive pregnant women, those with high viral loads may benefit from targeted antiviral agents, thereby reducing the likelihood of vertical transmission (12). The prospective design and inclusion of both isolated viral hepatitis and concurrent IHCP enhance the applicability of our results. However, the absence of comprehensive viral load data, the single-center scope, and limited neonatal follow-up remain important limitations, underscoring the need for larger, multi-institutional studies to corroborate these findings and refine evidence-based guidelines.

CONCLUSION

Viral hepatitis during pregnancy poses significant risks for both mothers and infants, including heightened morbidity, increased cesarean delivery, and compromised neonatal outcomes. When IHCP coexists, these dangers become more pronounced, reflected by higher preterm delivery rates and NICU admissions. Moving forward, systematic prenatal screening, earlier therapeutic intervention—particularly antiviral treatment for high viral loads—and close hepatologic-obstetric collaboration are vital to mitigating adverse outcomes and curbing maternal-fetal disease transmission.

Limitations
1. Single-center data may not represent broader geographic variations in viral hepatitis epidemiology.
2. Limited viral load information restricted an in-depth analysis of vertical transmission risk.
3. Lack of extended maternal or pediatric follow-up precluded assessment of long-term outcomes.

Acknowledgement
The author would like to acknowledge all the patients who have participated and helped out in the conduction and completion of this study. I would also like to thank the staff and residents of the Department of Obstetrics and Gynaecology, Santosh Medical College and Hospital, Ghaziabad in supporting this case report.

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