International Journal of Reproduction, Contraception, Obstetrics and Gynecology
Shobhane HJ et al. Int J Reprod Contracept Obstet Gynecol. 2026 Jul;15(7):2511-2515
www.ijrcog.org
pISSN 2320-1770 | eISSN 2320-1789

DOI: https://dx.doi.org/10.18203/2320-1770.ijrcog20262096

Original Research Article

Clinical profile and fetal outcomes of liver disorders in pregnancy: a one-year retrospective study at a tertiary care centre

Hema J. Shobhane, Anushka Pandey*

Department of Obstetrics and Gynecology, Maharani Laxmi Bai Medical College, Jhansi, Uttar Pradesh, India

Received: 11 April 2026
Revised: 25 May 2026
Accepted: 01 June 2026

***Correspondence:**
Dr. Anushka Pandey,
E-mail: anudharti2012@gmail.com

ABSTRACT

Background: Liver disorders in pregnancy are associated with significant maternal and perinatal morbidity and mortality. The spectrum includes pregnancy-specific conditions such as HELLP syndrome and intrahepatic cholestasis of pregnancy (IHCP), as well as coincidental hepatic diseases including viral hepatitis. Early diagnosis and timely management are critical for improving outcomes in affected mothers and neonates.
Methods: A retrospective observational study was conducted at Maharani Laxmi Bai Medical College and Hospital, Jhansi, from February 2025 to February 2026. A total of 200 pregnant women diagnosed with liver disorders were included. Data were collected from hospital records and analysed using the chi-square test with $p<0.05$ considered statistically significant.
Results: HELLP syndrome was the most common disorder (61%), followed by viral hepatitis (23%) and IHCP (16%). The mean patient age was 26.4±4.2 years. Intrauterine fetal demise (IUFD) was significantly higher in IHCP (21.9%) compared to HELLP (13.9%) and hepatitis (10.9%) ($p=0.04$). Preterm delivery (45.9%, $p=0.01$) and NICU admissions (51.6%, $p=0.03$) were significantly higher in HELLP syndrome. The difference in caesarean section rates across groups was not statistically significant ($p=0.18$).
Conclusions: HELLP syndrome is associated with significant maternal and neonatal morbidity, while IHCP demonstrates disproportionately higher fetal mortality despite lower prevalence. Viral hepatitis remains a clinically significant coincidental disorder. Early identification, multidisciplinary management, and timely obstetric intervention are essential to reduce adverse fetomaternal outcomes in pregnant women with liver disorders.

Keywords: Liver disorders in pregnancy, HELLP, IHCP, Fetal outcome

INTRODUCTION

Liver disorders complicate approximately 0.15-3% of all pregnancies and are an important cause of maternal and perinatal morbidity and mortality worldwide.[1] The spectrum of hepatic disorders encountered in pregnancy is broad and includes conditions unique to pregnancy, as well as pre-existing or coincidental liver diseases that may be modified by the pregnant state.[2] Pregnancy-specific liver disorders include Intrahepatic Cholestasis of Pregnancy (IHCP), HELLP syndrome (Haemolysis, Elevated Liver enzymes, and Low Platelets), Acute Fatty Liver of Pregnancy (AFLP), and hyperemesis gravidarum-associated liver dysfunction. Among these, HELLP syndrome and IHCP are the most frequently encountered in tertiary care settings.[3,4] HELLP syndrome, a severe complication of preeclampsia, occurs in approximately 0.5-0.9% of all pregnancies and is associated with significant maternal complications including disseminated intravascular coagulation (DIC), acute renal failure and placental abruption.[5] IHCP, characterized by pruritus and elevated serum bile acids in the second or third trimester,

is associated with adverse fetal outcomes including intrauterine fetal demise (IUFD), preterm birth, and meconium-stained amniotic fluid.[6] The reported prevalence of IHCP varies widely from 0.1%-15.6% depending on geographic and ethnic factors.[7] Serum bile acid levels above 40 µmol/l have been consistently associated with a significant increase in the risk of stillbirth.[8]

Viral hepatitis, particularly hepatitis B and E, represents an important coincidental liver disorder in pregnancy in developing countries. Hepatitis E infection during pregnancy carries a case fatality rate of up to 25% and is a major contributor to fulminant hepatic failure in pregnant women in South Asia.[9] Hepatitis B vertical transmission remains a significant public health concern, with rates of mother-to-child transmission reaching 85-90% without appropriate prophylaxis.[10]

The diagnosis and management of hepatic disorders in pregnancy is challenging due to the physiological changes in liver function tests that occur during normal gestation, as well as the overlapping clinical features between different conditions.[11] Alanine aminotransferase (ALT) and aspartate aminotransferase (AST) remain the most sensitive markers of hepatocellular injury during pregnancy, as alkaline phosphatase levels are normally elevated due to placental production.[12]

Several studies from tertiary care institutions in India and other low- and middle-income countries have documented the burden of liver disorders in pregnancy, with HELLP syndrome and viral hepatitis being the predominant causes of maternal morbidity.[13,14] However, data on the comparative fetomaternal outcomes across different hepatic conditions remain limited. Jain et al reported HELLP syndrome as the leading cause of maternal morbidity in their cohort of 106 patients at a tertiary centre in India.[15] Similarly, Kumari et al demonstrated that IHCP was independently associated with increased risk of preterm labour and perinatal mortality.[16]

Early identification of hepatic dysfunction in pregnancy, prompt investigation, and appropriate timely intervention is critical to improving maternal and neonatal outcomes. Understanding the distribution and relative severity of different liver disorders in a tertiary care population is essential for directing resources and formulating management protocols.[17] In this context, the present study was undertaken to evaluate the clinical profile and fetomaternal outcomes of liver disorders in pregnancy at a tertiary care centre over a one-year period, comparing outcomes across HELLP syndrome, IHCP and viral hepatitis.

METHODS

This retrospective observational study was conducted in the Department of Obstetrics and Gynaecology at Maharani Laxmi Bai Medical College and Hospital, Jhansi, Uttar Pradesh, over a period of one year from February 2025 to February 2026.

The study included 200 pregnant women diagnosed with liver disorders during pregnancy who were admitted to the antenatal ward, labour room, or intensive care unit of the hospital during the study period.

Selection criteria

Inclusion criteria

The study included pregnant women diagnosed with liver disorders during pregnancy, comprising pregnancy-specific liver disorders such as HELLP syndrome, intrahepatic cholestasis of pregnancy (IHCP) and coincidental liver diseases associated with pregnancy including viral hepatitis. Only patients with complete medical records available for analysis were included.

Exclusion criteria

Patients with incomplete hospital records were excluded, as were pregnant women with pre-existing chronic liver disease diagnosed prior to pregnancy.

Ethical approval

The study was exempted from ethical review due to retrospective record-based design as per institutional policy.

Study procedure

Data were collected retrospectively from hospital medical records, antenatal registers, labour room records, discharge summaries and neonatal intensive care unit (NICU) records.

The following parameters were recorded: maternal demographic profile including age and parity; gestational age at presentation and delivery; clinical presentation and laboratory investigations; type of liver disorder diagnosed; mode of delivery; maternal complications; and fetal and neonatal outcomes including intrauterine fetal demise (IUFD), preterm delivery, and NICU admission. Diagnosis of HELLP syndrome was based on evidence of haemolysis, elevated liver enzymes, and thrombocytopenia. IHCP was diagnosed clinically by pruritus with deranged liver function tests after exclusion of other causes. Viral hepatitis was diagnosed using serological investigations. Patients were managed according to institutional protocols with multidisciplinary care involving obstetricians, physicians, intensivists, and neonatologists whenever required.

Statistical analysis

Data were entered into Microsoft Excel and analysed using Statistical Package for Social Sciences (SPSS) software

version 25.0. Categorical variables were expressed as frequencies and percentages. Association between different liver disorders and fetomaternal outcomes was assessed using the chi-square test. A p value of <0.05 was considered statistically significant.

RESULTS

A total of 200 pregnant women with liver disorders were analysed during the study period. The distribution of diagnoses was as follows: HELLP syndrome 122 cases (61%), viral hepatitis 46 cases (23%), and IHCP 32 cases (16%), as shown in Table 1. The mean age of patients was 26.4±4.2 years. The majority were multigravida (58%). HELLP syndrome was the predominant condition, accounting for nearly two-thirds of all cases, reflecting the high-risk referral nature of the study centre.

Table 1: Distribution of liver disorders in pregnancy (n=200).

Liver disorder	Number of cases	Percentage (%)
HELLP syndrome	122	61.0
Hepatitis	46	23.0
IHCP	32	16.0
Total	200	100

Table 2 shows that the LSCS rate was highest in the HELLP group (59%), followed by IHCP (50%) and viral hepatitis (43.5%). However, the difference in mode of delivery across the three groups was not statistically significant (p=0.18), indicating that the type of hepatic disorder did not independently influence the choice of delivery mode.

Table 2: Mode of delivery among study groups.

Disorder	LSCS N (%)	Vaginal delivery N (%)	P value
IHCP	16 (50)	16 (50)	0.18 (NS)
HELLP	72 (59)	50 (41)	
Hepatitis	20 (43.5)	26 (56.5)	
Total	-	-	

As depicted in Table 3, IUFD was highest in the IHCP group (21.9%), compared to HELLP (13.9%) and viral hepatitis (10.9%). This difference was statistically significant (p=0.04), underscoring the disproportionate fetal mortality risk associated with IHCP, despite its lower overall prevalence among the study population.

Table 4 demonstrates that preterm delivery was most frequent in the HELLP group (45.9%), significantly higher than IHCP (34.4%) and viral hepatitis (21.7%) (p=0.01). This is consistent with the clinical management of HELLP syndrome, which often necessitates early delivery to prevent further deterioration of maternal condition.

Table 3: Fetal outcomes (intrauterine fetal death).

Outcome	IHCP N (%)	HELLP N (%)	Hepatitis N (%)
IUFD	7 (21.9)	17 (13.9)	5 (10.9)
P value		0.04*	

*Statistically significant (p<0.05), NS=Not significant; IUFD= Intrauterine fetal death; IHCP=Intrahepatic cholestasis of pregnancy; HELLP=Haemolysis.

Table 4: Preterm delivery.

Disorder	Preterm N (%)	Term N (%)	P value
IHCP	11 (34.4)	21 (65.6)	0.01*
HELLP	56 (45.9)	66 (54.1)	
Hepatitis	10 (21.7)	36 (78.3)	
Total	-	-	

*Statistically significant (p<0.05); NS=Not significant; IHCP= Intrahepatic cholestasis of pregnancy; HELLP=Haemolysis.

Table 5 reveals that NICU admissions were significantly higher in the HELLP group (51.6%) compared to IHCP (40.6%) and viral hepatitis (34.8%) (p=0.03). The elevated NICU admission rate in HELLP reflects the high frequency of preterm and growth-restricted neonates in this subgroup, necessitating intensive neonatal care.

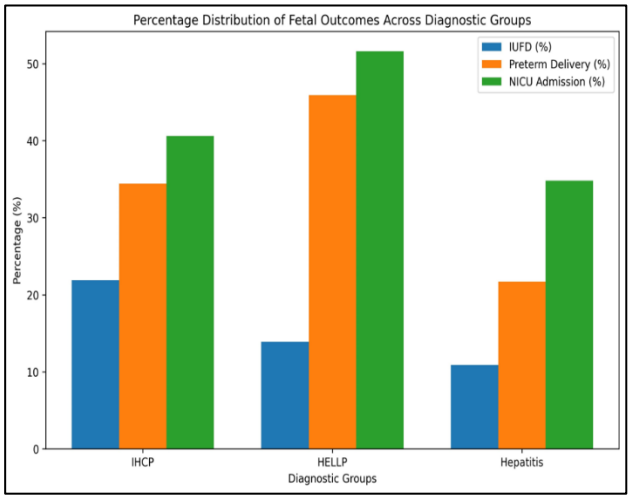
Table 5: NICU admissions.

Disorder	NICU admission N (%)	No NICU admission N (%)	P value
IHCP	13 (40.6)	19 (59.4)	0.03*
HELLP	63 (51.6)	59 (48.4)	
Hepatitis	16 (34.8)	30 (65.2)	
Total	-	-	

*Statistically significant (p<0.05); NS=Not significant; NICU= Neonatal intensive care unit; IHCP=Intrahepatic cholestasis of pregnancy; HELLP=Haemolysis, Elevated liver enzymes, Low platelets.

In the present study, HELLP syndrome was the predominant liver disorder, accounting for 61% of all cases. This high prevalence likely reflects the tertiary care referral pattern of our institution, which receives a disproportionate number of severe obstetric complications from peripheral centres. HELLP syndrome was significantly associated with preterm delivery (45.9%, p=0.01) and NICU admissions (51.6%, p=0.03), underscoring the substantial neonatal burden attributable to this condition. The high rate of preterm delivery in HELLP patients is consistent with the clinical need for expedited delivery as a definitive management strategy once the maternal condition is stabilized. IHCP, while representing only 16% of cases, was associated with the highest rate of IUFD (21.9%, p=0.04), highlighting its disproportionate

impact on fetal survival. The sudden and unpredictable nature of stillbirth in IHCP, even in the absence of severe maternal symptoms, underscores the critical importance of close fetal surveillance and timely delivery in this condition. The high IUFD rate in our IHCP cohort may partly reflect delayed presentation or inadequate monitoring in the antenatal period at the referring centres.



*p<0.05 denotes statistical significance.

Figure 1: Percentage distribution of fetal outcomes (IUFD, preterm delivery, NICU admissions) across the three diagnostic groups.

Viral hepatitis accounted for 23% of cases and was associated with the lowest rates of preterm delivery and NICU admissions among the three groups, though the IUFD rate of 10.9% remained clinically significant. The overall LSCS rate did not differ significantly across the three groups (p=0.18), suggesting that the mode of delivery was largely dictated by obstetric indications rather than the specific hepatic diagnosis.

DISCUSSION

Comparison with previous studies

The predominance of HELLP syndrome in our series is in accordance with findings reported by Jain et al, who identified HELLP as the most common liver disorder in a tertiary care cohort in India, with a maternal morbidity rate of 68%.[15] Similarly, Sibai et al in a landmark multicentre study reported preterm delivery in 46-67% of HELLP a range consistent with our finding of 45.9% in the HELLP group.[5]

The significantly higher IUFD rate in IHCP observed in our study is consistent with existing literature. Ovadia et al in a systematic review of 4,264 women with IHCP demonstrated a significantly increased risk of stillbirth when serum bile acids exceeded 100 µmol/l.[8] Kumari et al similarly found perinatal mortality rates of 18-22% in IHCP patients, comparable to our rate of 21.9%.[8] The NICU admission rates in HELLP syndrome (51.6%) in our study are consistent with the rates of 40-55% reported by Haram et al in a comprehensive review of HELLP syndrome outcomes.[18]

Regarding viral hepatitis, the 10.9% IUFD rate in our hepatitis group aligns with data from Patra et al, who reported perinatal mortality rates of 8-14% in pregnant women with hepatitis E infection. Khuroo et al previously documented a fulminant hepatic failure rate of 22% in hepatitis E-complicated pregnancies in Kashmir, emphasizing the severity of this condition in South Asian populations.[9,19] The non-significant difference in LSCS rates across our three groups (p=0.18) is in agreement with Wadhwa et al, who also found that the type of hepatic disorder was not an independent predictor of caesarean delivery.[14]

Overall, the findings of the present study reinforce the conclusions of prior literature that HELLP syndrome and IHCP represent the most clinically significant pregnancy-specific liver disorders, each with distinct profiles of maternal and fetal morbidity. Early identification, multidisciplinary management and timely delivery remain the cornerstones of improving outcomes in these high-risk patients.

Limitations

The present study has several limitations that should be acknowledged. First, the retrospective design is inherently subject to selection bias and missing data, as records may be incomplete for certain variables such as serum bile acid levels in IHCP patients and detailed laboratory parameters in hepatitis. Second, the study was conducted at a single tertiary care centre with a high-risk referral population, which may limit the generalizability of findings to primary care settings or the general obstetric population. The high prevalence of HELLP syndrome (61%) is likely an overestimate compared to the true population prevalence, reflecting referral bias.

Third, the relatively short study duration of one year may not capture seasonal variation in hepatitis E infections or adequately represent rare conditions such as AFLP. Fourth, the study lacked long-term follow-up data on neonatal neurodevelopmental outcomes and maternal hepatic function following delivery, which would provide a more complete picture of morbidity. Fifth, information on severity stratification (e.g., Tennessee classification for HELLP, bile acid levels for IHCP, hepatitis genotype) was not uniformly available, which precluded subgroup analyses within each diagnostic category. Future prospective multicentre studies with standardized data collection protocols are needed to address these limitations.

CONCLUSION

Liver disorders in pregnancy remain an important cause of maternal and perinatal morbidity, particularly in tertiary care settings. In the present study, HELLP syndrome was

the most common hepatic disorder and was significantly associated with higher rates of preterm delivery and NICU admissions, reflecting its substantial maternal and neonatal burden. Although less prevalent, intrahepatic cholestasis of pregnancy demonstrated the highest rate of intrauterine fetal demise, highlighting its serious impact on fetal survival. Viral hepatitis also contributed considerably to adverse fetomaternal outcomes. Early diagnosis, close maternal and fetal surveillance, multidisciplinary management and timely obstetric intervention are essential for improving outcomes and reducing complications associated with liver disorders in pregnancy.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

REFERENCES

1. Williamson C, Geenes V. Intrahepatic cholestasis of pregnancy. Obstet Gynecol. 2014;124(1):120-33.
2. Westbrook RH, Dusheiko G, Williamson C. Pregnancy and liver disease. J Hepatol. 2016;64(4):933-45.
3. Lee NM, Brady CW. Liver disease in pregnancy. World J Gastroenterol. 2009;15(8):897-906.
4. Pathak B, Sheibani L, Lee RH. Cholestasis of pregnancy. Obstet Gynecol Clin North Am. 2010;37(2):269-82.
5. Sibai BM. Diagnosis, controversies, and management of the syndrome of hemolysis, elevated liver enzymes, and low platelet count. Obstet Gynecol. 2004;103(5):981-91.
6. Geenes V, Williamson C. Intrahepatic cholestasis of pregnancy. World J Gastroenterol. 2009;15(17):2049-66.
7. Arrese M, Reyes H. Intrahepatic cholestasis of pregnancy: a past and present riddle. Ann Hepatol. 2006;5(3):202-5.
8. Ovadia C, Seed PT, Sklavounos A, Geenes V, Di Ilio C, Chambers J, et al. Association of adverse perinatal outcomes of intrahepatic cholestasis of pregnancy with biochemical markers: results of aggregate and individual patient data meta-analyses. Lancet. 2019;393(10174):899-909.
9. Patra S, Kumar A, Trivedi SS, Puri M, Sarin SK. Maternal and fetal outcomes in pregnant women with acute hepatitis E virus infection. Ann Intern Med. 2007;147(1):28-33.
10. Bzowej NH. Hepatitis B therapy in pregnancy. Curr Hepat Rep. 2010;9(4):197-204.
11. Ahmed KT, Almashhrawi AA, Rahman RN, Hammoud GM, Ibdah JA. Liver diseases in pregnancy: diseases unique to pregnancy. World J Gastroenterol. 2013;19(43):7639-46.
12. Hay JE. Liver disease in pregnancy. Hepatology. 2008;47(3):1067-76.
13. Goel A, Jamwal KD, Ramachandran A, Balasubramanian KA, Eapen CE. Pregnancyrelated liver disorders. J Clin Exp Hepatol. 2014;4(2):151-62.
14. Wadhwa L, Sarin SK, Govila A. Maternal outcome of liver disease complicating pregnancy. J Obstet Gynaecol India. 2009;59(5):427-31.
15. Jain R, Suri V, Chopra S, Chawla YK, Kohli KK. Obstetric cholestasis: outcome with active management. J Obstet Gynaecol Res. 2013;39(5):953-9.
16. Kumari M, Garg T, Mittal S. Intrahepatic cholestasis of pregnancy: a prospective study. J Obstet Gynaecol India. 2016;66(1):451-6.
17. Rathi C, Pipaliya N, Phadke A, Ingle M, Patel P, Sawant P. Spectrum of liver disorders in pregnancy from western India. Indian J Gastroenterol. 2015;34(3):216-24.
18. Haram K, Svendsen E, Abildgaard U. The HELLP syndrome: clinical issues and management. A review. BMC Pregnancy Childbirth. 2009;9:8.
19. Khuroo MS, Kamili S. Aetiology and prognostic factors in acute liver failure in India. J Viral Hepat. 2003;10(3):224-31.

Cite this article as: Shobhane HJ, Pandey A. Clinical profile and fetal outcomes of liver disorders in pregnancy: a one-year retrospective study at a tertiary care centre. Int J Reprod Contracept Obstet Gynecol 2026;15:2511-5.