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Study of clinical profile maternal and perinatal outcome in women with hepatic disorders admitted at a rural tertiary care hospital

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Abstract
Background: Pregnancy leads to significant hormonal and metabolic changes that can affect liver function, resulting in a spectrum of hepatic disorders. These may arise from pregnancy-specific conditions, aggravation of pre-existing liver disease, or unrelated causes. Liver dysfunction in pregnancy carries substantial risks for both mother and fetus, making early identification and appropriate management essential. This study aimed to evaluate the clinical profile, maternal complications, and perinatal outcomes in women with hepatic disorders during pregnancy.
Materials and Methods: A descriptive cross-sectional study was conducted at Pravara Institute of Medical Sciences [DU], Loni, Maharashtra, over 18 months (from April 2023 to March 2025). Pregnant women diagnosed with hepatic disorders were included after informed consent. Clinical features, laboratory findings, and outcomes were analyzed using Microsoft Excel 2020 and SPSS version 21, following Institutional Ethics Committee approval.
Results: Among 116 pregnant women with hepatic disorders, preeclampsia was the most common cause (37%), followed by impending eclampsia (27.6%), HELLP syndrome (12.9%), and eclampsia (12.9%). Maternal complications occurred in 81.9% of cases, predominantly anemia, DIC, HELLP syndrome, and postpartum hemorrhage. Placental abruption and retinopathy were also observed. Regarding fetal outcomes, 74.1% of newborns experienced complications, with prematurity (58.6%), intrauterine growth restriction (34.5%), and intrauterine fetal demise (18.1%) being the most frequent. There were 21 IUFDs and 14 stillbirths, while 34 neonates required NICU admission. Neonatal mortality was 12.1%, mainly due to respiratory distress syndrome (50%). Despite this, 91.4% of mothers were stable at discharge, while 6% succumbed to complications.
Conclusion: The study highlights that hypertensive disorders of pregnancy are the leading causes of hepatic dysfunction, with high rates of maternal and fetal complications requiring vigilant monitoring and timely intervention.

Keywords: Hepatic disorders, pregnancy, maternal complications, perinatal outcomes

Introduction
Pregnancy is a distinct physiological state marked by widespread systemic adaptations that enable fetal development while maintaining maternal homeostasis. Hormonal changes, particularly elevated estrogen and progesterone levels, profoundly affect hepatic metabolism, protein synthesis, and bile excretion [1]. These hormonal and hemodynamic shifts render the liver vulnerable to both pregnancy-specific and coexistent hepatic disorders.
Liver diseases during pregnancy are broadly categorized into three groups: pregnancy-specific disorders such as acute fatty liver of pregnancy (AFLP), hyperemesis gravidarum, intrahepatic cholestasis of pregnancy (ICP), and HELLP syndrome; coincidental hepatic disorders like viral hepatitis and gallstones; and chronic liver diseases, including cirrhosis and autoimmune hepatitis [2]. Among these, viral hepatitis remains the leading cause of jaundice in pregnant women globally. Hepatic dysfunction may arise from conditions unique to pregnancy, exacerbation of pre-existing liver disease, or unrelated hepatic pathology [3].
The five major pregnancy-related hepatic disorders AFLP, HELLP syndrome, preeclamptic liver dysfunction, ICP, and hyperemesis gravidarum manifest at different gestational stages. While serum bilirubin, ALT, and AST typically remain within normal limits, alkaline phosphatase increases due to placental isoenzyme production, and serum albumin decreases from

hemodilution [4]. Worldwide, liver disorders complicate about 3% of pregnancies [5]. In a Mexican study, hepatic dysfunction affected 11.24% of pregnancies, mostly linked to preeclampsia (9.9%) [6].

In patients with cirrhosis, hepatic decompensation occurs in roughly 10% of pregnancies, predictable using the MELD score. Immunosuppressants such as azathioprine, tacrolimus, and corticosteroids can be safely continued in autoimmune hepatitis and post-transplant cases [7]. Physiological variations during pregnancy include decreased AST, ALT, bilirubin, and GGT (about 20% lower than standard ranges) and increased alkaline phosphatase, triglycerides, cholesterol, and ceruloplasmin levels [8].

Table 1: Physiological Changes in Liver Function During Pregnancy

Liver Test Result	Physiological Change Compared with Normal Range
Increased	Alkaline phosphatase, fibrinogen, α-fetoprotein, WBC count, ceruloplasmin, cholesterol, α- and β-globulins, triglycerides
Unchanged	Aminotransferases, prothrombin time
Decreased	Bilirubin, γ-globulin, haemoglobin

Though some biochemical alterations are physiological, liver disorders during pregnancy can lead to severe maternal and fetal complications. Common maternal outcomes include HELLP syndrome, DIC, acute renal failure, septicemia, encephalopathy, and postpartum hemorrhage. Elevated bilirubin levels can impair placental perfusion, causing fetal asphyxia, preterm labor, or intrauterine death [9,10].

In developing nations, maternal mortality and morbidity remain high due to poor hygiene, malnutrition, anemia, delayed diagnosis, and inadequate access to tertiary care. Preventive measures such as health education, sanitation improvement, hepatitis vaccination, and vigilant antenatal monitoring are vital for reducing complications.

The present study was undertaken with the aim to evaluate the clinical profile, maternal, and perinatal outcomes in women with hepatic disorders during pregnancy. The objectives were: (1) to study the clinical presentation of hepatic disorders in pregnant women, (2) to determine maternal complications and outcomes, and (3) to assess fetal and perinatal outcomes, including morbidity and mortality.

Understanding the spectrum and impact of hepatic disorders in pregnancy is crucial, particularly in developing regions where poor sanitation, malnutrition, anemia, and delayed medical attention increase risk. Timely diagnosis, early referral, and multidisciplinary care can significantly improve maternal and neonatal outcomes.

Material and Methods

After obtaining approval from the Institutional Ethical Committee of Pravara Institute of Medical Sciences [DU], Loni, Maharashtra, this observational descriptive cross-sectional study was conducted in the Department of Obstetrics and Gynecology, Pravara Rural Hospital, Loni, over a period of 18 months (from April 2023 to March 2025).

Study Population and Sample Size

All pregnant women admitted with a diagnosis of hepatic disorder during the study period were evaluated for inclusion. Women who met the selection criteria and provided written informed consent were enrolled. The final sample size included all eligible cases encountered during the study duration.

Inclusion Criteria

- All pregnant women diagnosed with hepatic disorders during the study period.
- Women willing to participate and who provided written informed consent.

Exclusion Criteria

- Pregnant women without evidence of hepatic disorder.

Methodology

Eligible participants were evaluated through detailed clinical history, including demographic profile, obstetric history, and presenting complaints. A thorough general and systemic examination was performed, focusing on signs of hepatic dysfunction such as jaundice, hepatomegaly, ascites, or edema.

Laboratory investigations included liver function tests (LFTs) serum bilirubin, AST, ALT, ALP, and serum albumin performed at the time of admission and repeated as necessary depending on disease progression. Other relevant investigations (e.g., coagulation profile, renal function tests, and complete blood count) were conducted to assess maternal condition and possible complications.

Maternal complications, including anemia, disseminated intravascular coagulation (DIC), HELLP syndrome, postpartum hemorrhage, and placental abruption, were recorded. Fetal and perinatal outcomes were evaluated in terms of gestational age at delivery, birth weight, intrauterine growth restriction (IUGR), intrauterine fetal demise (IUFD), prematurity, NICU admission, and neonatal mortality. Neonates requiring intensive care were followed up in the NICU until discharge or death. Both mother and neonate were monitored until discharge or demise to document outcomes.

Outcome Measures

Primary outcomes included the type and severity of hepatic disorders, maternal complications, and mortality. Secondary outcomes included perinatal complications such as prematurity, IUGR, IUFD, and neonatal death.

Statistical Analysis

All collected data were entered into Microsoft Excel 2020 and analyzed using SPSS version 21. Quantitative data were expressed as mean ± standard deviation (SD), and qualitative variables were represented as frequencies and percentages. The Chi-square test was used for assessing associations between categorical variables, while the unpaired t-test was applied for comparison of continuous variables between groups. A p-value <0.05 was considered statistically significant at a 95% confidence interval.

Ethical Considerations:

Ethical clearance was obtained from the Institutional Ethics Committee (IEC) before commencement of the study. Confidentiality of participant data was maintained throughout, and informed consent was obtained from all participants prior to inclusion.

Results

A total of 116 antenatal women diagnosed with hepatic disorders

were studied to assess their clinical profile, maternal condition, and perinatal outcomes. The majority of women were between 20 and 30 years of age (80.2%), with a mean age of 24.9 years, indicating that hepatic dysfunction in pregnancy is more common in young adults. Slightly more than half were multigravida (51.7%), suggesting recurrence or cumulative obstetric risk. Regarding gestational age, 40.5% of women were at term (≥37 weeks), while 38.8% presented before 34 weeks, showing that hepatic disorders can occur at any stage but often intensify toward the third trimester. The most common presenting complaints were vomiting (25%), decreased fetal movements (24.1%), abdominal pain and headache (23.3% each), followed by nausea (20.7%) and PV leak (18.1%). Less frequent symptoms included convulsions, visual disturbances, raised blood pressure, and vaginal bleeding, often linked to preeclampsia, eclampsia, or HELLP syndrome. Overall, the data indicate that hepatic disorders in pregnancy predominantly affect young multigravid women, with gastrointestinal and hypertensive symptoms being the most frequent clinical presentations. [Table 1]

Table 1: Distribution of Cases According to Age, Parity, Gestational Age, and Presenting Complaints

Parameter	Category	Frequency (n)	Percentage (%)	Interpretation
Age (years)	<20	16	13.8	Least affected age group
	20–25	46	39.7	Commonly affected
	25–30	47	40.5	Most affected group
	>30	7	6.0	Least representation
	Mean Age:	**24.9 years**		Most cases occurred among young adults (20–30 years)
Parity	Primigravida	57	48.3	Nearly equal distribution
	Multigravida	59	51.7	Slightly higher occurrence among multigravidas
Gestational Age (weeks)	<34 weeks	45	38.8	Early gestation cases common
	34–36+6 weeks	24	20.7	Moderate representation
	≥37 weeks	47	40.5	Slightly higher proportion at term
Presenting Complaints	Vomiting	29	25.0	Most common symptom
	Decreased/Absent fetal movement	28	24.1	Frequently reported
	Headache	27	23.3	Associated with hypertensive disorders
	Abdominal pain	27	23.3	Common in HELLP/eclampsia
	Nausea	24	20.7	Nonspecific symptom
	PV leak	21	18.1	Suggestive of obstetric complications
	Lower limb swelling	19	16.4	Reflective of preeclampsia-related edema
	Convulsions	15	12.9	Indicates eclampsia
	Visual disturbances	12	10.3	Common in severe preeclampsia
	Raised BP (Referred cases)	10	8.6	Hypertensive presentation
	PV bleed	10	8.6	Suggestive of abruption/placental pathology
	Deranged LFT/RFT (Referred)	5	4.3	Detected via lab abnormalities
	Anemia (Referred)	4	3.5	Common comorbidity
	Pruritus	2	1.7	Seen in intrahepatic cholestasis
	Fever	1	0.9	Least common
	Facial swelling	1	0.9	Rare presentation

On general examination, majority of women exhibited edema (65.5%), pallor (52.6%), and icterus (23.3%), indicating widespread anemia, fluid overload, and hepatic dysfunction. The mean systolic blood pressure among study participants was 144.4 ± 21.2 mmHg, and the mean diastolic blood pressure was 96 ± 14.7 mmHg, both higher than normal pregnancy values. These findings suggest a predominance of hypertensive disorders, such as preeclampsia and eclampsia, as underlying causes of hepatic dysfunction. The mean pulse rate of 98.8 ± 11.5 beats per minute indicates a mild increase, which can be attributed to physiological stress, anemia, or ongoing systemic inflammation. Overall, the vital parameters recorded support the clinical profile of hypertensive and hepatic involvement in pregnancy, commonly associated with complications like placental abruption and HELLP syndrome. [Table 2, Figure 1]

Table 2: General Examination Findings

Parameter	Frequency (n)	Percentage / Mean ± SD	Interpretation
Edema	76	65.5%	Most common finding indicating fluid retention/preeclampsia
Pallor	61	52.6%	Suggestive of anemia and poor nutritional status
Icterus	27	23.3%	Reflects hepatic dysfunction

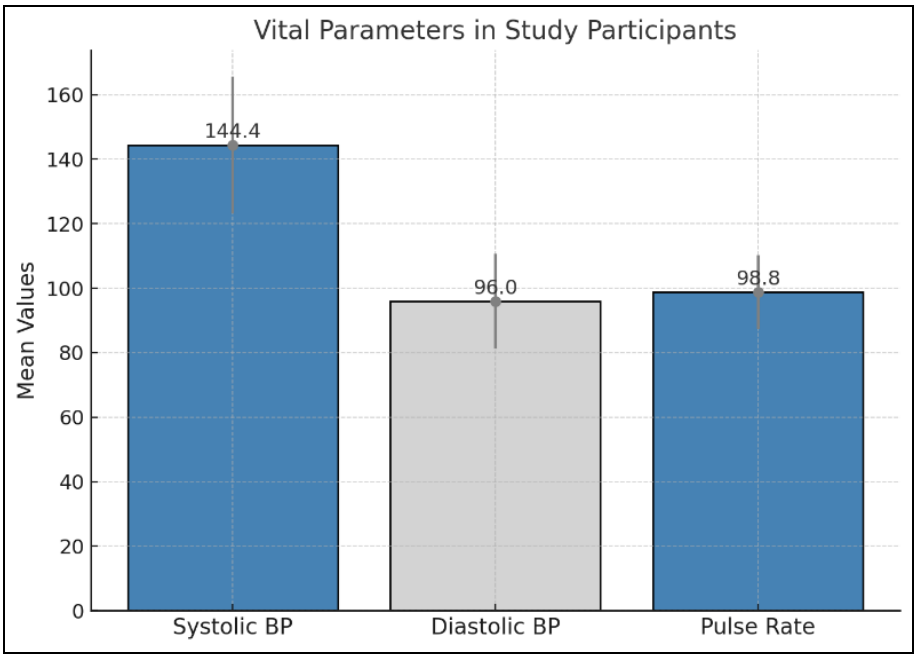

Fig 1: Distribution of Cases According to Vital Parameters

Most patients showed marked hepatic enzyme elevation SGOT (97.4%) and SGPT (96.6%) confirming hepatic injury. Urine albumin positivity (82.8%) and hyperuricemia (78.4%) reflected renal and hypertensive components. Hematologic abnormalities such as thrombocytopenia (64.7%), low hemoglobin (44%), and prolonged PT/INR (~46%) indicated HELLP syndrome and coagulopathy. Elevated LDH (63.8%) and bilirubin (~74%) reinforced multi-organ involvement in hepatic dysfunction. [Table 3]

Table 3: Laboratory Investigation Profile

Parameter	Positive (n)	%	Parameter	Positive (n)	%
SGOT elevated	113	97.4	LDH elevated	74	63.8
SGPT elevated	112	96.6	Thrombocytopenia	75	64.7
Urine albumin	96	82.8	Prolonged INR	54	46.6
Hyperuricemia	91	78.4	Prolonged PT	53	45.7
Hyperbilirubinemia (Total)	85	73.3	Dyscreatininemia	48	41.4
Hyperbilirubinemia (Unconjugated)	86	74.1	Hyperuremia	39	33.6
Hyperbilirubinemia (Conjugated)	70	60.3	Low Hemoglobin	51	44.0
Hyperalkaline phosphatasemia	56	48.3	Hypoproteinemia	35	30.2
Raised D-dimer	31	26.7	Hypoglycemia	29	25.0
Deranged fibrinogen	26	22.4	Leukocytosis	18	15.5
Viral markers positive	12	10.3	Hyperammonemia	7	6.0
Hypercholanemia	3	2.6	Ketonuria	2	1.7

Radiological findings showed that Ultrasonography revealed oligohydramnios (37.1%), IUGR (35.3%), and IUFD (18.1%) as common findings, emphasizing placental insufficiency. Postpartum scans showed ascites (35.3%) and renal parenchymal changes (14.7%), reflecting systemic involvement in severe hepatic disease. [Table 4]

Table 4: USG and Color Doppler Findings (Obstetric and Postpartum)

Finding	Frequency (n)	%	Finding (Postpartum)	Frequency (n)	%
Oligohydramnios	43	37.1	Ascites	41	35.3
IUGR	41	35.3	Bilateral renal echogenicity	17	14.7
Uteroplacental insufficiency	26	22.4	Hepatosplenomegaly	9	7.8
IUFD	21	18.1	Splenomegaly	7	6.0
Fetoplacental insufficiency	10	8.6	GB wall edema	5	4.3
Retroplacental clots	10	8.6	Hepatomegaly	1	0.9
Decreased umbilical flow	3	2.6			
Absent end-diastolic flow	2	1.7			

The hypertensive disorders of pregnancy preeclampsia, eclampsia, and HELLP accounted for over 75% of hepatic dysfunctions, confirming that liver injury during pregnancy is most often secondary to vascular and hypertensive pathology rather than viral or metabolic causes. [Table 5].

Table 5: Causes of Liver Disorders in Pregnancy

Etiology	Frequency (n)	%
Pre-eclampsia	43	37.0
Impending eclampsia	32	27.6
HELLP syndrome	15	12.9
Eclampsia	15	12.9
Viral hepatitis B	6	5.2
Viral hepatitis C	4	3.4
ICP	3	2.6
Hyperemesis gravidarum	2	1.7
Hepatitis A	2	1.7
Gilbert's syndrome	1	0.9
Rickettsial fever	1	0.9
AFLP	1	0.9

More than half of the women (56%) underwent lower segment cesarean section (LSCS), primarily due to fetal distress or worsening maternal condition. Vaginal delivery occurred in 44% of cases. Maternal complications were notably high (81.9%), with common issues including anemia, HELLP syndrome, retinopathy, and acute renal failure. A substantial proportion of women required intensive care (30.2%) and blood transfusion (60.3%), reflecting the systemic and multisystem involvement in hepatic dysfunction during pregnancy. These findings underscore the severe nature and complexity of hepatic disorders in pregnancy, necessitating vigilant maternal monitoring, prompt management, and multidisciplinary support to reduce morbidity and mortality. [Table 6]

Table 6: Delivery Mode, Complications, and ICU Requirements

Parameter	Category	Frequency (n)	%
Mode of delivery	LSCS	65	56.0
	Vaginal	51	44.0
Maternal complications (overall)	Present	95	81.9
	Absent	21	18.1
ICU admission	Yes	35	30.2
	No	81	69.8
Transfusion required	Yes	70	60.3
	No	46	39.7

The leading maternal morbidities were anemia (49.1%), HELLP syndrome (46.6%), and retinopathy (38.8%). Life-threatening complications included acute renal failure (17.2%), DIC (15.5%), and abruption (12.9%). Maternal mortality was 6%, often associated with multi-organ failure. [Table 7].

Table 7: Detailed Maternal Complications

Complication	Frequency (n)	%
Anemia	57	49.1
HELLP syndrome	54	46.6
Retinopathy	45	38.8
Acute renal failure	20	17.2
DIC	18	15.5
Abruption	15	12.9
PPH	10	8.6
PRES	7	6.0
Maternal death	7	6.0
Septicemia	6	5.2
Postpartum convulsions	4	3.4
Multi-organ failure	4	3.4
Others (encephalopathy, effusion, hysterectomy, etc.)	<3 each	<3% each

Fetal compromise was evident in three-fourths of cases (74.1%), mainly due to prematurity (58.6%), IUGR (34.5%), and IUFD (18.1%). Among neonates requiring intensive care, RDS (50%) and sepsis (26.5%) were predominant causes of morbidity. [Table 8]

Table 8: Fetal Complications and Neonatal Findings

Parameter	Frequency (n)	%
Fetal complications (overall)	86	74.1
Prematurity	68	58.6
IUGR	40	34.5
IUFD	21	18.1
NICU admissions	34	29.3
NICU diagnoses		
– Respiratory distress syndrome (RDS)	17	50.0
– Neonatal sepsis	9	26.5
– RDS + Sepsis	3	8.8
– HIE + IVH	3	8.8
– HIE	2	5.9

Despite the high complication burden, 91.4% of mothers recovered, while 6% succumbed to severe hepatic or hypertensive complications. Among neonates, 57.8% were healthy, whereas 12.1% each experienced stillbirth or neonatal death, largely due to prematurity and RDS. [Table 9]

Table 9: Neonatal Outcomes and Maternal Status at Discharge

Outcome	Frequency (n)	%
Well (breast/formula fed)	67	57.8
Fresh stillbirth	14	12.1
Neonatal death	14	12.1
Maternal status		
Stable	106	91.4
Referred in critical condition	3	2.6
Maternal death	7	6.0

Overall, in this study, hypertensive disorders of pregnancy including preeclampsia, eclampsia, and HELLP syndrome accounted for over 75% of hepatic dysfunction cases. The burden of complications was considerable, with maternal morbidity observed in 81.9% and fetal morbidity in 74.1% of participants. A significant proportion of women required intensive care (30.2%) and blood transfusions (60.3%), reflecting the severe systemic impact of hepatic disease during pregnancy. Among perinatal outcomes, prematurity (58.6%) and low birth weight (mean 2075.6 ± 622 g) were predominant findings. Despite a high rate of complications, the maternal survival rate was 91.4%; however, maternal mortality (6%) and neonatal deaths (12.1%) emphasize the critical nature of hepatic dysfunction in pregnancy and the need for early diagnosis, prompt management, and multidisciplinary care.

Discussion

This descriptive cross-sectional study was conducted in the Department of Obstetrics and Gynecology at a tertiary care center, involving 116 antenatal women diagnosed with liver disorders during pregnancy. Various clinical and biochemical parameters including parity, gestational age, vital signs, general examination findings, laboratory investigations, ultrasonographic (USG) findings, and fetomaternal outcomes were evaluated to understand the clinical spectrum and outcomes associated with hepatic dysfunction in pregnancy.

In India, the reproductive age group typically ranges from 20 to 25 years, and in the present study, 80.2% (n=93) of the participants were between 20 and 30 years, with the largest group (40.5%, n=47) aged 25–30 years and a mean age of 24.9 years. Only 13.8% were below 20 years. This age pattern aligns with previous studies. Chidanandaiah SK *et al*. [11] found that 50% of patients belonged to the 21–25 years group (mean age 22.5 years), while Mallesara A *et al*. [12] reported a mean age of 21.34 years. Similarly, Kota LN *et al*. [13] found that most cases occurred in women aged 21–25 years, and Rimaitis K *et al*. [14] documented a mean age of 28 ± 5.6 years. The findings are consistent with Bahadur A *et al*. [15], where 90.21% of participants were aged 20–35 years, and Panchbudhe SA *et al*. [16], where 73.3% were between 21–30 years. Thus, hepatic disorders during pregnancy predominantly affect young women in their peak reproductive years.

Regarding parity, 51.7% (n=59) were multigravida and 48.3% (n=57) primigravida, suggesting a slightly higher prevalence in women with previous pregnancies. Contrastingly, Chidanandaiah SK *et al*. [12], Mallesara A *et al*. [13], and Rimaitis K *et al*. [14] reported a predominance of primigravida cases. Bahadur *et al*. [15] also found a higher proportion of primigravida (44.02%). However, the present study observed more multigravida cases, possibly reflecting regional or referral patterns.

By gestational age, 59.5% (n=69) of hepatic disorder cases occurred before 37 weeks, with the majority (38.8%) presenting before 34 weeks. This aligns with Haram *et al*. [17], who noted that most cases occur between 27 and 37 weeks, and George P *et al*. [18], where conditions developed by 32–36 weeks. Rimaitis K *et al*. [1] reported a mean gestational age of 33 ± 4.6 weeks, while Vijay C *et al*. [19] observed that 68.4% presented after 37 weeks. Overall, hepatic dysfunction is more frequent in the late second and third trimesters.

The most frequent symptoms in the current study were vomiting (25%), decreased or absent fetal movements (24.1%), abdominal pain (23.3%), and headache (23.3%). Other complaints included nausea (20.7%), edema, and visual disturbances. Chidanandaiah SK *et al*. [11] reported malaise (50%), edema (45%), vomiting (20%), and headache (56.2%) as common symptoms, while Li Boya *et al*. [20] observed headaches or visual symptoms in 25% of cases. The mean systolic BP was 144.4 mmHg, and diastolic BP 96 mmHg, consistent with preeclampsia-related hepatic dysfunction. The findings reaffirm that nausea, vomiting, and headache are typical early symptoms of pregnancy-related liver disease.

On general examination, edema (65.5%) and pallor (52.6%) were predominant, suggesting anemia and fluid retention, whereas icterus (23.3%) indicated hepatic dysfunction. These findings were comparable to earlier studies, emphasizing that systemic manifestations accompany hepatic disorders in pregnancy.

In laboratory investigations, deranged liver enzymes were prominent, with elevated SGOT (97.4%) and SGPT (96.6%) in almost all cases, while total bilirubin (73.3%), direct bilirubin (60.3%), and indirect bilirubin (74.1%) were elevated in a majority. Renal involvement was also evident: raised uric acid (78.4%), creatinine (41.4%), and urea (33.6%) levels. Hematological abnormalities included thrombocytopenia (64.7%) and anemia (44%). These findings closely resemble Irrinki VJ *et al*. [21], who reported mean bilirubin of 3.42 mg/dL, AST 152.59 µg/L, ALT 149.94 µg/L, and LDH 1022 µg/L. Similarly, Gao X *et al*. [22] noted elevated bilirubin, ALT, and creatinine levels. These consistent abnormalities highlight the multisystem impact of hepatic dysfunction in pregnancy.

Regarding etiology, preeclampsia (37%), impending eclampsia (27.6%), and HELLP syndrome (12.9%) were the most common causes, followed by eclampsia (12.9%) and viral hepatitis B (5.2%). These findings parallel Chidanandaiah SK *et al*. [12], Chaudhari S *et al*. [23], and Kota LN *et al*. [13], who identified hypertensive disorders as predominant causes of hepatic dysfunction. Studies by Bahadur A *et al*. [24] and Rana M *et al*. [25] showed varying contributions from intrahepatic cholestasis and viral hepatitis, though hypertensive disorders remain the leading cause worldwide.

Radiological evaluation revealed ascites (35.3%) as the most frequent abnormality on postpartum USG, followed by renal echogenicity (14.7%) and hepatosplenomegaly (7.8%), findings that correspond with systemic vascular compromise associated with preeclampsia and HELLP syndrome.

In terms of delivery outcomes, 56% of women underwent cesarean section (LSCS), while 44% delivered vaginally. The preference for cesarean delivery reflects the need for rapid termination of pregnancy in cases of maternal or fetal compromise. Rimaitis K *et al*. [14] similarly reported 67.6% LSCS deliveries. Bahadur A *et al*. [15] observed early inductions or cesarean sections in one-third of cases, supporting the current findings.

Maternal complications were observed in 81.9% of women. The most common were anemia (49.1%), HELLP syndrome (46.6%), retinopathy (38.8%), and acute renal failure (17.2%), followed by DIC (15.5%), abruption (12.9%), and PPH (8.6%). Chidanandaiah SK *et al*. [12] and Chaudhari S *et al*. [23] also noted PPH, ascites, and renal failure as leading complications. These findings reaffirm that hepatic dysfunction in pregnancy is frequently associated with multisystem failure and coagulopathy.

A significant proportion (30.2%) required ICU admission, underscoring the severity of illness. Bahadur A *et al*. [212] reported 1.08% ICU admissions, indicating that the higher rate in this study may reflect referral bias or more severe cases. Furthermore, 60.3% required blood transfusions, indicating substantial hematologic compromise. Comparable findings were reported by Gao X *et al*. [22] (28.9%) and Bahadur A *et al*. [15] (14.6%), showing variable but consistent need for transfusion support.

Fetal outcomes were poor, with complications in 74.1% of cases prematurity (58.6%), IUGR (34.5%), and IUFD (18.1%). These findings correlate with Chaudhari S *et al*. [23] (prematurity 50%, IUGR 32.7%) and George P *et al*. [18] (preterm 76.3%). Bahadur A *et al*. [15] and Panchbudhe SA *et al*. [16] similarly reported high rates of preterm birth and perinatal morbidity, reflecting the burden of maternal hepatic dysfunction on fetal growth and survival.

Among neonates, the mean birth weight was 2075.6 ± 662 g, with most (64.7%) weighing below 2500 g. Comparable findings were reported by Vijay C *et al*. [19], where 65% of newborns were low birth weight. NICU admissions occurred in 34 cases,

mainly for respiratory distress syndrome (50%) and sepsis (26.5%). Despite intensive management, 12.1% of neonates died.

At discharge, 91.4% of women were stable, 6% succumbed to complications, and 2.6% required transfer to higher centers for specialized care. Mortality rates in previous studies ranged widely from 1.1% (Haram K *et al*.) [17] to 21% (Vijay C *et al*.) [19] depending on severity and healthcare access. The relatively low mortality in this study may be attributed to timely diagnosis and multidisciplinary management.

Overall, the study reinforces that hypertensive disorders of pregnancy remain the leading cause of hepatic dysfunction, with significant maternal and fetal morbidity. Early recognition, close monitoring, and prompt delivery remain crucial for improving outcomes.

Conclusion

Hepatic disorders during pregnancy continue to pose a significant threat to both maternal and fetal health, especially in developing regions where delayed diagnosis and limited resources complicate management. This study reaffirms that hypertensive disorders particularly preeclampsia, eclampsia, and HELLP syndrome remain the leading causes of hepatic dysfunction in pregnancy, accounting for most maternal and perinatal complications. The predominance of cases among young women in late gestation underscores the critical need for vigilant antenatal surveillance.

Marked biochemical derangements such as elevated liver enzymes, hyperuricemia, and thrombocytopenia reflect the multisystem nature of the disease, often progressing to complications like renal failure, DIC, and anemia. Despite these challenges, timely diagnosis, aggressive maternal stabilization, and multidisciplinary coordination were instrumental in achieving a 91% maternal survival rate in this cohort.

Overall, this study highlights the importance of early recognition, regular monitoring, and prompt intervention to prevent progression to life-threatening complications. Strengthening antenatal screening, public health awareness, and tertiary care access can substantially improve maternal and neonatal outcomes, ultimately reducing the burden of hepatic disorders in pregnancy.

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Author's Contribution

Not available

Conflict of Interest

Not available

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