ejpmr, 2025, 12(3), 219-231

SJIF Impact Factor 7.065

EUROPEAN JOURNAL OF PHARMACEUTICAL AND MEDICAL RESEARCH

www.ejpmr.com

Research Article

ISSN 2394-3211

EJPMR

CLINICAL STUDY OF FETOMATERNAL OUTCOME IN HELLP SYNDROME

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Article Received on 03/01/2025 **Article Revised on 23/01/2025** **Article Accepted on 13/02/2025**

ABSTRACT

Patients whose pregnancies are complicated by HELLP syndrome are at high risk for complications such as abruptio placenta, disseminated intravascular coagulation, acute renal failure, Adult respiratory distress syndrome and Multiple organ dysfunction syndrome. The HELLP syndrome is associated with increased risk of adverse fetal outcome because of intrauterine growth restriction, and Prematurity.

INTRODUCTION

HELLP Syndrome is a serious obstetric complication in pregnancy characterised by haemolysis, elevated liver enzymes and low platelet count. Incidence is 0.5-0.9% of all pregnancies and in 10-20% of cases with severe preeclampsia and eclampsia. The diagnosis of HELLP syndrome may become very challenging because the patients may present with vague symptoms like nausea, vomiting, headache, malaise, or flu-like symptoms. This leads to misdiagnosis of HELLP syndrome with various mild conditions like viral Hepatitis to serious life-threatening conditions like acute fatty liver of pregnancy.

HELLP syndrome is characterized by vasospasm, endothelial dysfunction, fibrin deposition, varied degree of hepatic ischemic damage, micro angiopathic haemolytic anaemia and thrombocytopenia. Haemolysis, one of the major characteristics of the disorder, is due to a microangiopathic haemolytic anemia which is diagnosed by the presence of fragmented (schizocytes) or contracted red cells with spicula (Burr cells in the peripheral blood smear), increased reticulocyte counts, increased serum lactate dehydrogenase level and decreased haemoglobin concentrations. Low haptoglobin concentration is a more specific indicator of haemolysis and the presence of unconjugated bilirubin. Elevation of liver enzymes may reflect the haemolytic process as well as liver involvement. Haemolysis contributes substantially to the elevated levels of LDH, whereas enhanced aspartate aminotransferase (AST) and alanine aminotransferase (ALT) levels are mostly due to liver injury. Decreased platelet count in the HELLP syndrome is due to their increased consumption; Platelets are activated, and adhere to damaged vascular endothelial cells.

In about 70% of the cases, the HELLP syndrome develops before delivery with a peak frequency between 27th and 37th gestational weeks; 10% occur before 27th week, and 20% beyond the 37th gestational week. In the post-partum period the HELLP syndrome usually develops within the first 48 hours after delivery.

In current study, we aim to evaluate maternal and fetal factors associated with fetomaternal outcome in pregnancy with HELLP syndrome.

MATERIAL AND METHOD

Primary Objective

1) To evaluate the feto-maternal outcome in HELLP Syndrome complicating pregnancy.

Other Objectives

1) To analyse the clinical profile of HELLP Syndrome

This hospital based comparative cross sectional study was conducted in the department of Obstetrician and Gynaecology, in Tertiary care hospital in central India. 120 pregnant female Patients, attending at O.P.D. and labour room of Department of Obstetrics and Gynaecology, fulfilling the requisite criteria. The duration of the study was 18 months.

Institutional ethics committee approval was obtained prior to the start of the study. All patients from the outpatient department and labor room during emergency hours who fulfil the inclusion and exclusion criteria, willing to give written informed consent were included in the study. All the relevant information was recorded in case record form. Patients admitted in the labor room indicating raised blood pressure with deranged lab findings were involved in the study.

Sampling method and sample size: Sample size was determined by complete enumeration method.

Inclusion criteria

Women with >28wks of gestation age with laboratory findings in favor of HELLP Syndrome [with/without preeclampsia/eclampsia]

Exclusion criteria

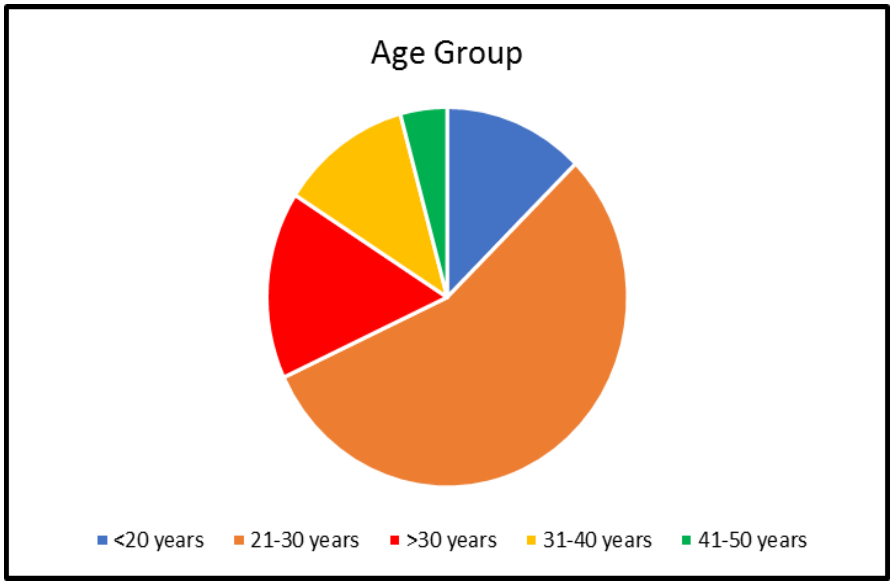
1) Women with less than 28 weeks of gestation.
2) Women with hypertension due to other than preeclampsia and eclampsia
3) Women with other disorders like viral hepatitis, gastroenteritis, cholecystitis and pancreatitis
4) Patient who denies participation after giving written informed consent

Withdrawal and drop-out criteria: NONE.

RESULT

Table 1: Distribution of Age.

Age Group	Frequency	Percent
<20 years	15	15.00%
21-30 years	66	66.00%
31-40 years	14	14.00%
41-50 years	5	5.00%
Mean age	27.01±6.30 years	



In Table 1, the distribution of age among the participants shows that the majority, 66%, fall within the 21-30 years age group. This is followed by 15% who are younger than 20 years, 14% who are 31-40 years old and 5% who are 41-50 years old. The mean age of the participants is 27.01±6.30 years.

Table 2: Distribution of Gravida.

Gravida	Frequency	Percent
Primi	28	28.00%
Multi (second and third gravida)	72	72.00%
Total	100	100.00%

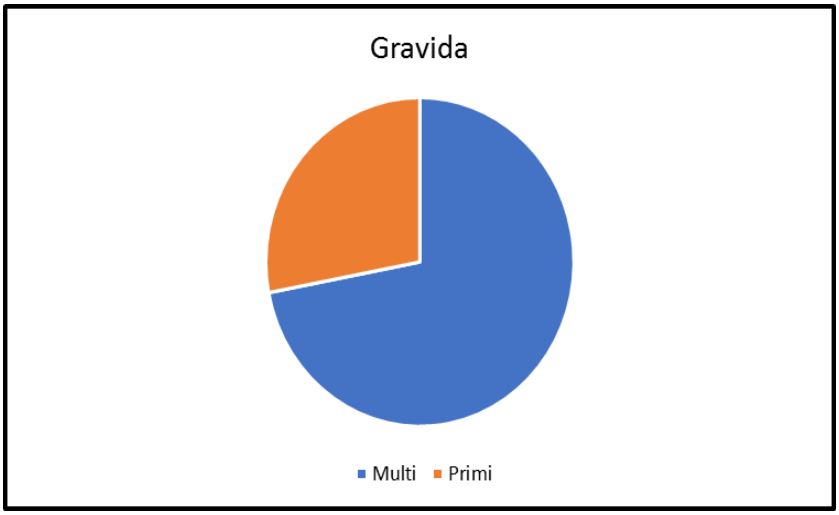
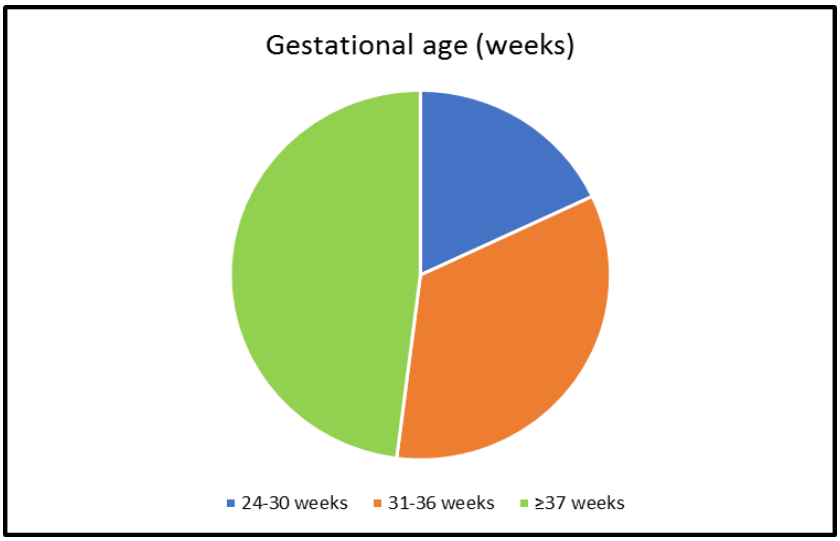


Table 2 presents the distribution of gravida, revealing that a significant majority of 72% of the participants are multigravida, meaning they have been pregnant more than once. Conversely, 28% are primigravida, experiencing their first pregnancy.

Table 3: Distribution of Gestational age.

Gestational age (weeks)	Frequency	Percent
<30 weeks	18	18.00%
30-34 weeks	34	34.00%
34-36 weeks	48	48.00%
Mean gestational age	33.00±3.80 weeks	



In Table 3, the distribution of gestational age indicates that most participants, 48%, are in the 34-36 weeks range. Those between <30 weeks constitute 18%, while those at 30-34 weeks make up 34%. The mean gestational age is 33.00±3.80 weeks.

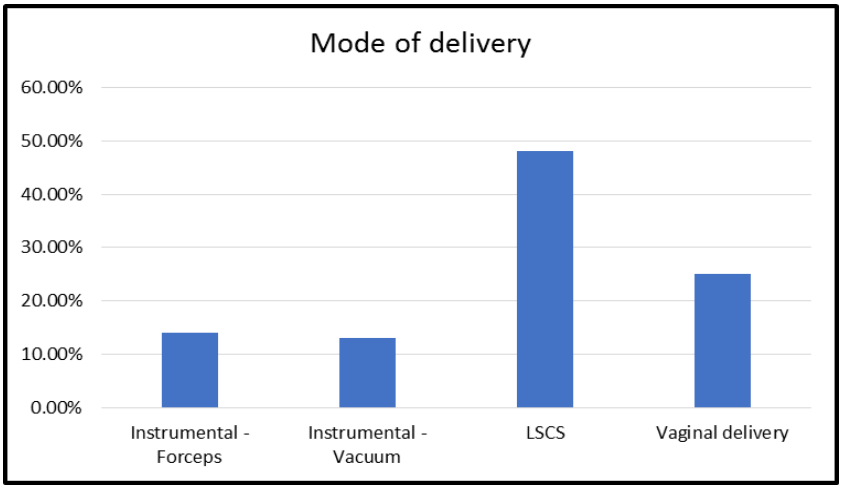
Table 4: Distribution of Laboratory parameters.

Laboratory parameters	Minimum	Maximum	Mean	SD
HB %	5.50	10.50	8.0	1.90
Serum Bilirubin	0.50	14.00	1.80	0.19
SGOT	30.00	8178.00	459.08	86.41
SGPT	13.00	4376.00	428.20	53.87
LDH	58.00	9867.00	3713.22	339.92
Platelets	10000.00	220000.00	66227.10	3693.03

Table 4 provides detailed statistics on laboratory parameters. The hemoglobin (HB) levels range from a minimum of 5.50% to a maximum of 10.50%, with a mean of 8.0% and a standard deviation of 1.90%. Serum bilirubin levels have a mean of 1.80 with a standard deviation of 0.19, spanning from 0.50 to 14.00. The SGOT values range from 30.00 to 8178.00, averaging 459.08 with an SD of 86.41. SGPT ranges from 13.00 to 4376.00, with a mean of 428.20 and an SD of 53.87. LDH levels show considerable variability, from 58.00 to 9867.00, with a high mean of 3713.22 and an SD of 339.92. Platelet counts range broadly from 10,000 to 220,000, with a mean of 66,227.10 and a standard deviation of 3693.03, indicating significant variations in the laboratory parameters among participants.

Table 5: Distribution of Mode of delivery.

Mode of delivery	Frequency	Percent
Vaginal delivery	25	25.0%
LSCS	48	48.0%
Forceps	14	14.0%
Vaccum	13	13.0%



The mode of delivery, as shown in Table 5, indicates that 48% of the participants underwent lower segment cesarean section (LSCS), while 25% had normal vaginal deliveries, 14% had undergone instrumental - forceps delivery and 13% had undergone instrumental - vacuum for delivery.

Table 6: Distribution of Antepartum/Postpartum.

Antepartum/Postpartum	Frequency	Percent
Antepartum	28	28.0%
Postpartum	72	72.0%

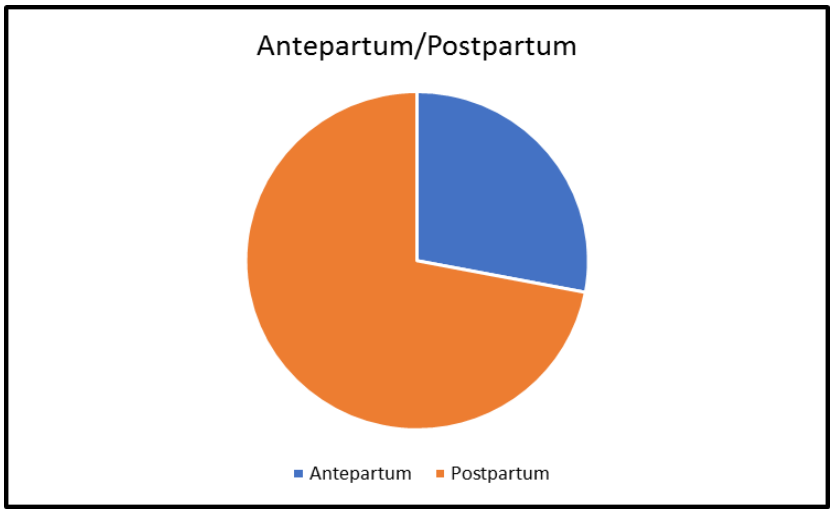


Table 6: Shows the distribution of Antepartum/Postpartum. 28% had Antepartum and 72% had postpartum deliveries.

Table 7: Distribution of Maternal complications.

Maternal complications	Frequency	Percent
Acute liver injury	6	6.0%
Acute renal failure	5	5.0%
Antepartum eclampsia	28	28.0%
DIC	26	26.0%
Oliguria	3	3.0%
Postpartum eclampsia	14	14.0%
Pulmonary edema	5	5.0%
Placental abruption	4	4.0%
Subcapsular liver haematoma	2	2.%
Thrombocytopenia	7	7.0%

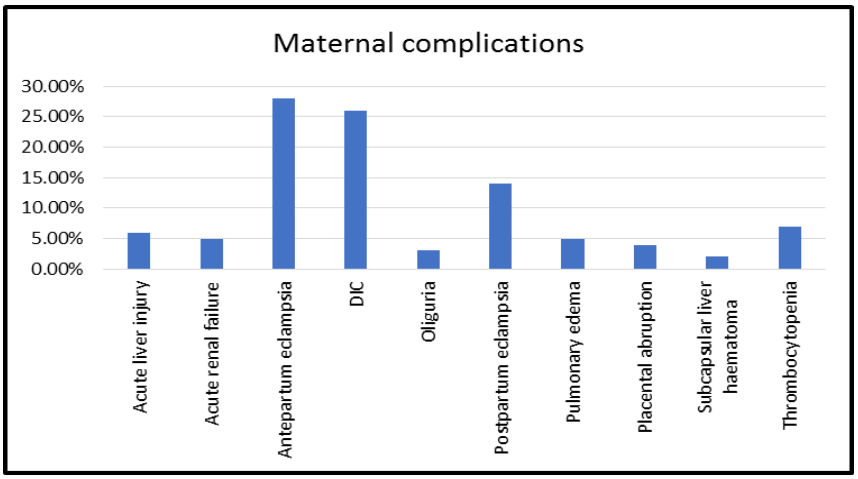


Table 7 highlights the distribution of maternal complications. The most common complication is disseminated intravascular coagulation (DIC), affecting 26% of the participants. Antepartum eclampsia affects 28%, and postpartum eclampsia affects 14%. Acute renal failure and pulmonary edema are less common, affecting 5% and 7% of the participants, respectively. 7% had thrombocytopenia, 6% had acute liver injury, 4% had placental abruption, 3% had oliguria and 2% had subcapsular liver haematoma.

Table 8: Distribution of Severity of preeclampsia.

Severity of preeclampsia	Frequency	Percent
severe	39	81.3%
Non severe	9	18.7%

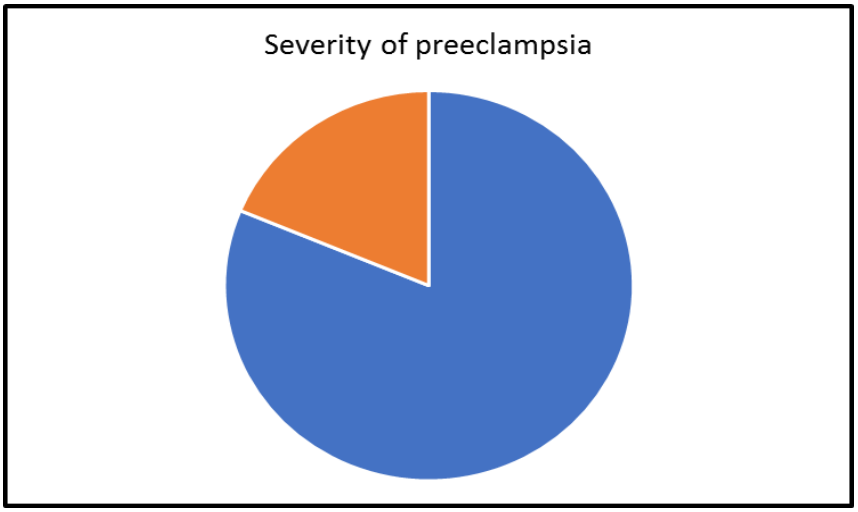


Table 8: shows distribution of severity of preeclampsia. 81.3% had severe and 18.7% had non severe preeclampsia.

Table 9: Distribution of Blood pressure.

Blood pressure (mmHg)	Frequency	Percent
>140/90	34	34.0%
>160/100	40	40.0%
>180/110	26	26.0%

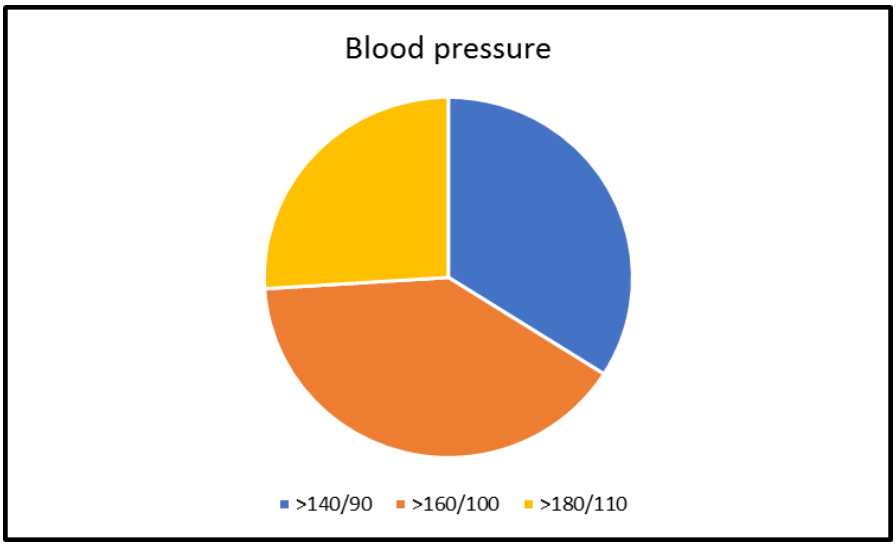


Table 9 shows the distribution of blood pressure. 40% had blood pressure of >160/100 mmHg, 34% had blood pressure of >140/90 mmHg and 26% had blood pressure of >180/110 mmHg.

Table 10: Distribution of Urine protein.

Urine protein	Frequency	Percent
+1	52	52.0%
+2	32	32.0%
+3	16	16.0%

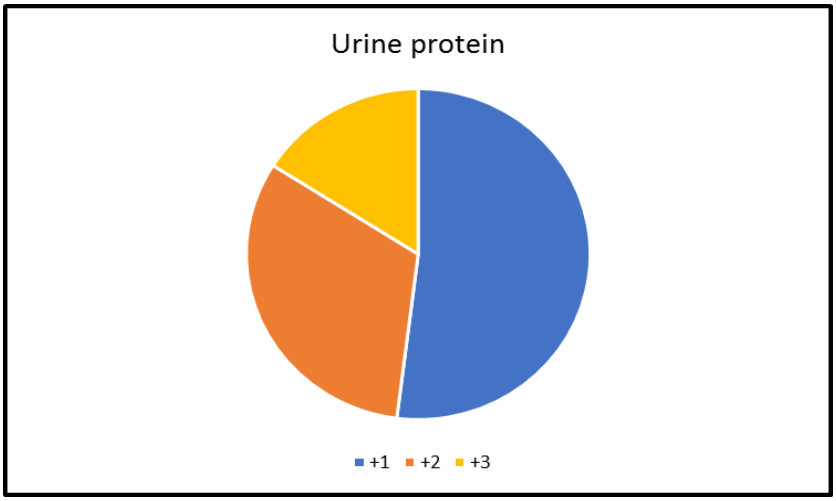


Table 10 shows the distribution of urine protein. 52% had +1 urine protein, 32% had +2 urine protein, and 16% had +3 urine protein.

Table 11: Distribution of Higher interventions.

Higher interventions	Frequency	Percent
Blood products	36	57.1%
Ionotropic support	9	14.3%
Ventilator support	12	19.0%
Dialysis	6	9.5%

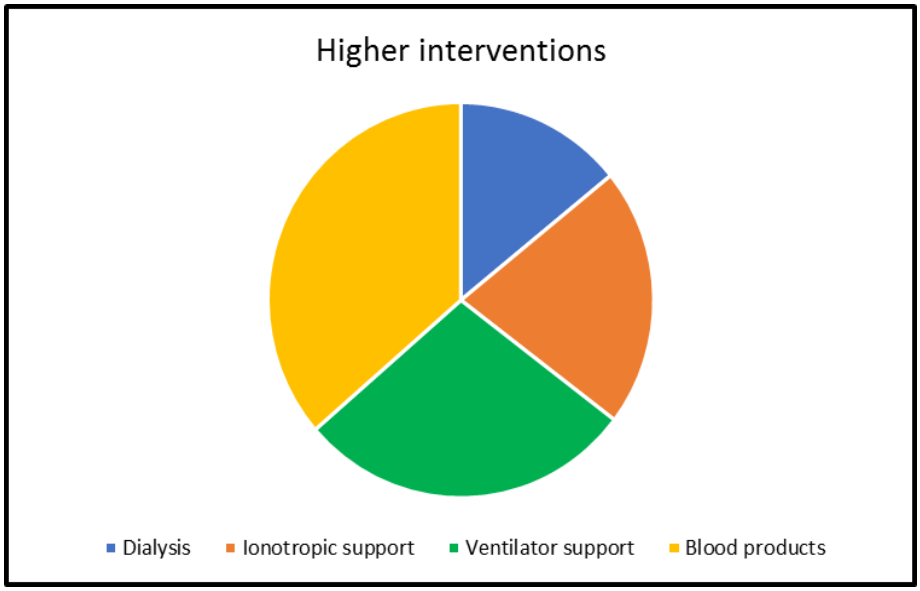


Table 11 shows the distribution of higher interventions. 57.1% required blood products, 19.0% were given ventilator support, 14.3% were given ionotropic support and 9.5% were given dialysis.

Table 12: Distribution of Blood products.

Blood products	Frequency	Percent
Whole blood	13	36.1%
Red cells	17	47.2%
FFP	6	16.7%

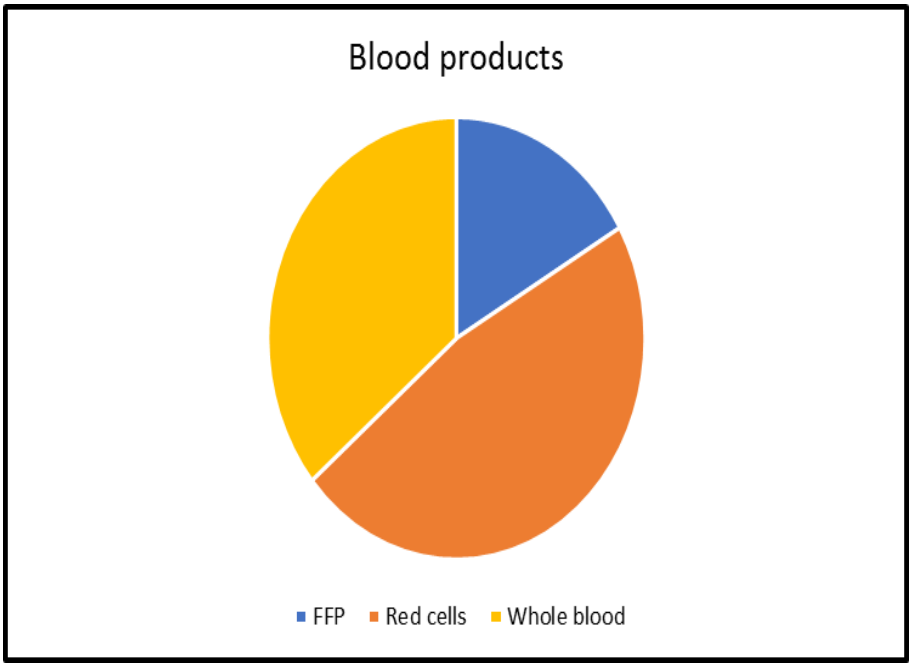
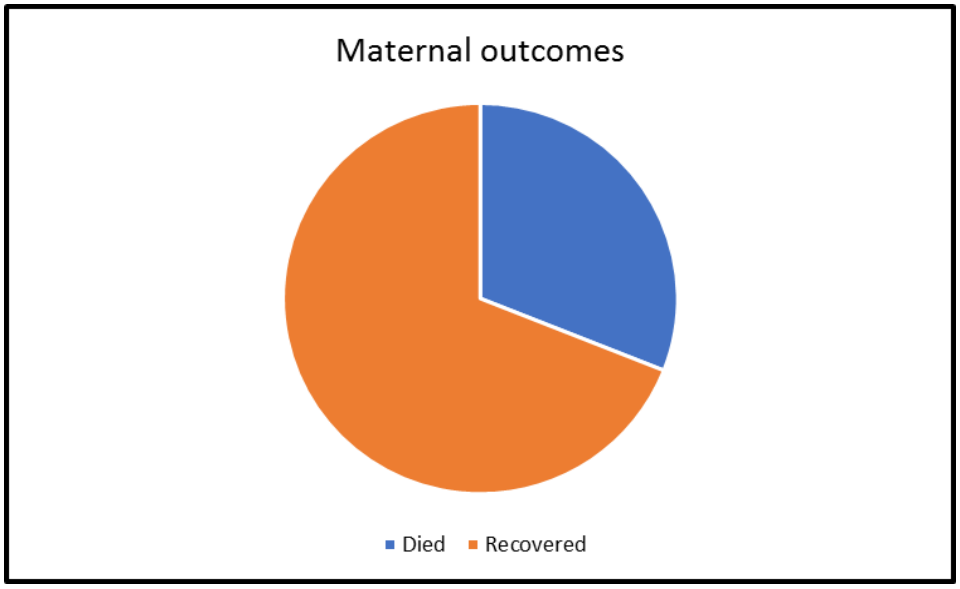


Table 12 shows the distribution of blood products. 47.2% were given red cells, 36.1% were given whole blood and 16.7% were given FFP.

Table 13: Distribution of Maternal outcomes.

Maternal outcomes	Frequency	Percent
Recovered	69	69.00%
Died	31	31.00%
Total	100	100.00%



In Table 13, maternal outcomes show that 31% of the participants died, whereas 69% recovered.

Table 14: Distribution of Baby maturity.

Baby maturity	Frequency	Percent
Preterm	84	84.00%
Term	16	16.00%
Total	100	100.00%

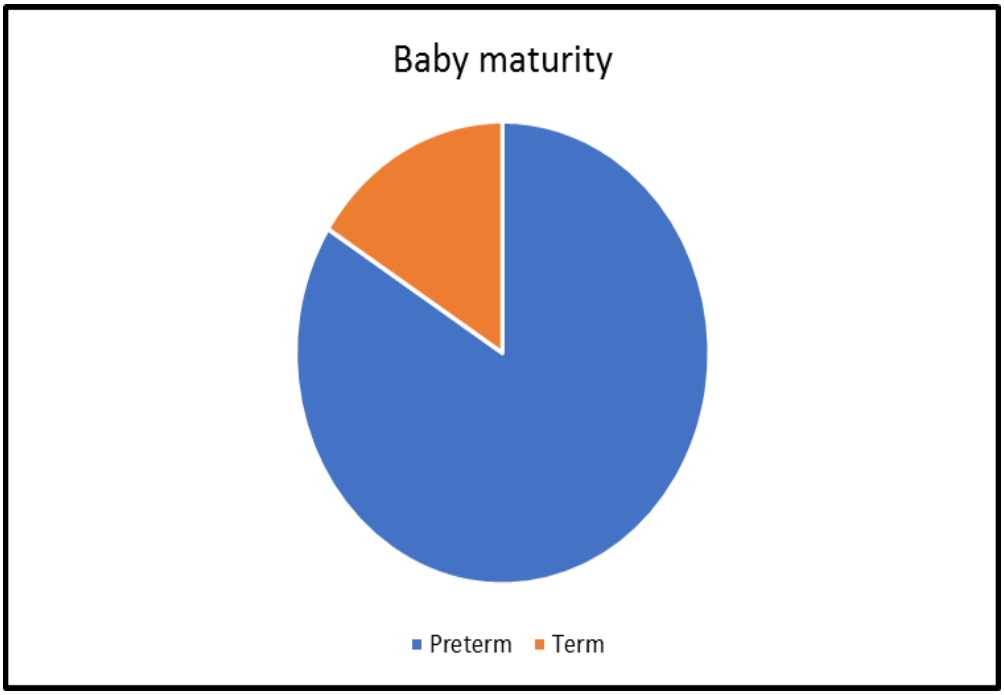


Table 14: illustrates the distribution of baby maturity, with 84% of the babies being preterm and 16% being term.

Table 15: Distribution of Baby weight.

Baby weight	Frequency	Percent
Low	69	69.0%
Normal	31	31.0%
Mean weight	1.97±0.77 kg	

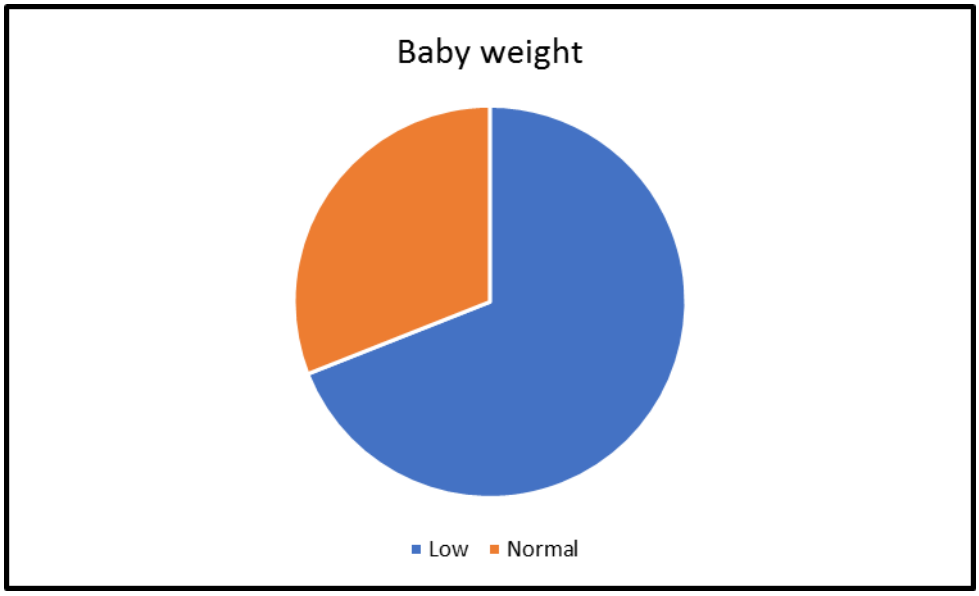


Table 15 illustrates the distribution of baby weight, with 69% of the babies with low birth weight and 31% with normal birth weight. Mean weight was 1.97±0.77 kg.

Table 16: Distribution of APGAR >7.

APGAR >7	Frequency	Percent
Yes	62	62.00%
No	38	38.00%
Total	100	100.00%

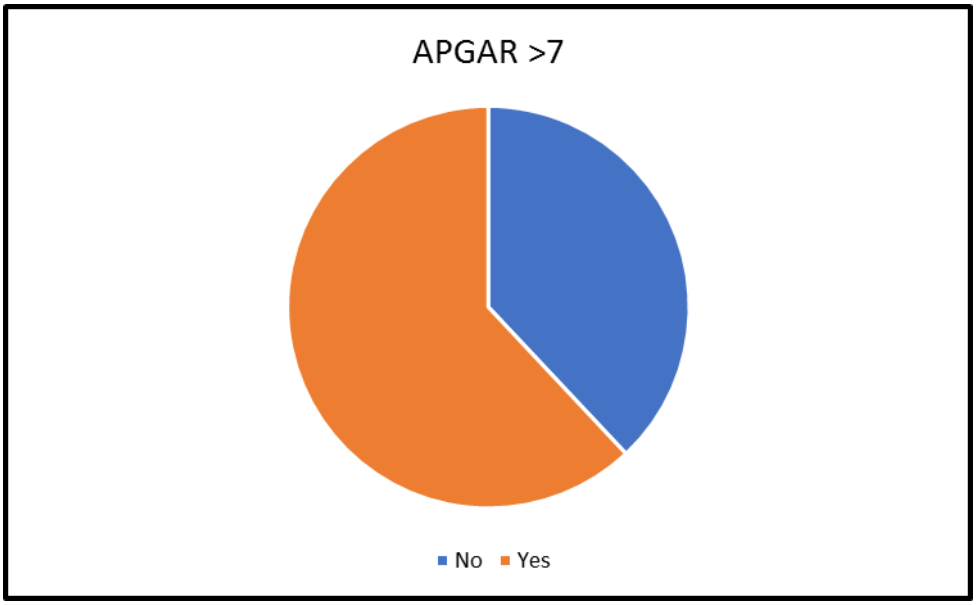


Table 16 shows the distribution of APGAR scores greater than 7, indicating that 62% of the babies had a favorable score, while 38% did not achieve this threshold.

Table 17: Distribution of Fetal outcomes.

Fetal outcomes	Frequency	Percent
Recovered	78	78.00%
Died	22	22.00%
Total	100	100.00%

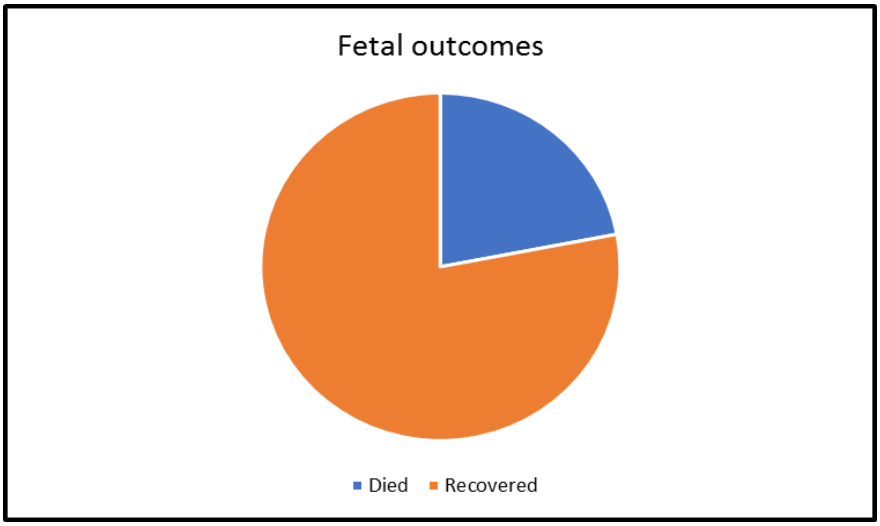


Table 17 details fetal outcomes, with 78% of the babies recovering and 22% dying.

DISCUSSION

In our study, the distribution of age among the participants shows that the majority, 66%, fall within the 21-30 years age group. This is followed by 15% who are younger than 20 years, 14% who are 31-40 years old and 5% who are 41-50 years old. The mean age of the participants is 27.01±6.30 years.

Chawla S. et al which has the average age of the patients was between 19–31 years (mean age 24.25 years).[6] Lakshmi NK et al stated that, 60% cases were in the age group of 21-25 years.[21] Amrit Pal Kaur et al stated that, mean age of all the patients with HELLP syndrome was 25.33±5.00 years.[12]

In our study, the distribution of gravida, revealing that a significant majority of 72% of the participants are multigravida(most commonly second gravida), meaning they have been pregnant more than once. Conversely, 28% are primigravida.

Campos A et al found that most of the women with HELLP syndrome were nulliparous, without differences between the two groups (p = 0.60).[22] Shelat PM et al stated that, 52.5% participants are primigravida, 47.5% participants are multigravida.[14] Amrit Pal Kaur et al stated that, majority of the patients in the present study were primigravida, 63.64% in complete HELLP and 66.55% in partial HELLP syndrome.[12]

In our study, the distribution of gestational age indicates that most participants, 48%, are in the 34-36 weeks range. Those between <30 weeks constitute 18%, while those at 30-34 weeks make up 34%. The mean gestational age is 33.00±3.80 weeks.

Durugkar K et al showed most patients with HELLP syndrome were between 33-36 weeks (38.2%) and majority of patients in partial HELLP group were of gestation age >36 weeks (54.5%).[11] George, et al stated that, maximum numbers of cases were recorded at gestational age 32-36 wk.[24]

In our study, the hemoglobin (HB) levels range from a minimum of 5.50% to a maximum of 10.50%, with a mean of 8%. Serum bilirubin levels have a mean of 1.80. The SGOT values range from 30.00 to 8178.00, averaging 459.08. SGPT ranges from 13.00 to 4376.00, with a mean of 428.20. LDH levels show considerable variability, from 58.00 to 9867.00, with a high mean of 3713.22. Platelet counts range broadly from 10,000 to 220,000, with a mean of 66,227.10 and a standard deviation of 3693.03, indicating significant variations in the laboratory parameters among participants.

Amrit Pal Kaur et al stated that, the mean platelet count in the patients with complete HELLP in the present study was 0.668±0.40 lacs/cumm[12] comparable with the study by Osmanagaoglu MA et al i.e. 62,676±38,333.37/cumm.[16] Amrit Pal Kaur et al stated that, mean LDH levels in the present study at time of admission was 832.17±249.81 U/L in partial HELLP patients and 1798.25±1196.25 U/L in complete HELLP patients.[12] In the study by Rakshit A et al, mean LDH levels in partial HELLP was 996.1±246.3 U/L and in complete HELLP was 1018.5±383.7 U/L.[17]

In our study, 48% of the participants underwent lower segment cesarean section (LSCS), while 25% had normal vaginal deliveries, 14% had undergone instrumental - forceps delivery and 13% had undergone instrumental – vacuum for delivery. 28% had Antepartum and 72% had postpartum deliveries

Amrit Pal Kaur et al stated that, among the patients of partial HELLP, 58.73% had vaginal delivery and 41.27% had cesarean section. Among complete HELLP, 25% had vaginal delivery and 75% underwent cesarean section.[12] Shelat PM et al stated that, 13 had vaginal deliveries and 27 patients underwent LSCS thus caesarean section

being most common mode of termination in HELLP syndrome.[14] Lakshmi NK et al stated that, All 15 cases (100%) were antepartum[21] which was comparatively higher than in of Ara S et al 75%.[23]

In our study, the most common complication are Antepartum eclampsia affects 28%, disseminated intravascular coagulation (DIC), affecting 26% of the participants and postpartum eclampsia affects 14%. Acute renal failure and pulmonary edema are less common, affecting 5% and 7% of the participants, respectively. 7% had thrombocytopenia, 6% had acute liver injury, 4% had placental abruption, 3% had oliguria and 2% had subcapsular liver haematoma.

Shelat PM et al stated that, most common complication in this study were acute renal failure (27.5%) and DIC (22.5%).[14] Study by Durugkar K et al and Kaur AP et al showed most common complications to be of DIC (14.1%) and eclampsia (21.1%) subsequently.[11,12]

In our study, 81.3% had severe and 18.7% had non severe preeclampsia. 40% had blood pressure of >160/100mmHg, 34% had blood pressure of >140/90 mmHg and 26% had blood pressure of >180/110 mmHg.

Amrit Pal Kaur et al stated that, 22.22% patients with partial HELLP had eclampsia and 12.5% patients of complete HELLP had eclampsia[12] and this was comparable with study by Bang NO et al in which 23% had eclampsia with HELLP syndrome.[18]

Gabbalkaje Shiva Anitha et al stated that, majority of the patients presented with BP >160/110 mm Hg (36 cases, 64.29%). The mean systolic BP was 158.79 ±17.23, and the mean diastolic BP was 112 ±13.72.[15]

In our study, 57.1% required blood products, 19.0% were given ventilator support, 14.3% were given ionotropic support and 9.5% were given dialysis. 47.2% were given red cells, 36.1% were given whole blood and 16.7% were given FFP.

Lakshmi NK et al stated that, in this study, 9 cases (60%) needed intensive care management; of which 8 cases were discharged home healthy and 1 case death occurred. All 9 cases (60%) were treated with FFP, platelet transfusion and other blood products.[21]

In our study, maternal outcomes show that 31% of the participants died, whereas 69% recovered.

Amrit Pal Kaur et al stated that, total 14 maternal deaths were seen out of 71 patients with HELLP syndrome (19.7%).[12] Tiwari P et al stated that, total maternal deaths were seen with HELLP syndrome (37.5%).[19] Lakshmi NK et al stated that, the maternal mortality was 1 (6.66%) because of late referral in bad condition.[21] It is comparable to Sibai BM et al (1.8%),[20] Isler CM et al (7.8%),[25] Vigil-de Gracia P (2.3%),[28] Sowjanya et al (4.5%),[26] Visser W et al (14.1%).[27]

In our study, the distribution of baby maturity revealing that, 84% of the babies being preterm and 16% being term. The distribution of baby weight revealing that, 69% of the babies with low birth weight and 31% with normal birth weight. Mean weight was 1.97±0.77 kg. The distribution of APGAR scores greater than 7, indicating that 62% of the babies had a favorable score, while 38% did not achieve this threshold. Fetal outcomes revealing that, 78% of the babies recovering and 22% dying.

Lakshmi NK et al stated that, 10 cases (66.6%) have average birth weight of >1kg-2.5kg of which 5 belonged to class III. In present study, 2 term deliveries (13.3%), of which 1 baby is alive and healthy and another is term IUFD. Preterm babies were 13 (86.6%), 7 of them were born alive with IUGR. Total number of live births was 8/15 (53.3%); of which 7 babies were preterm with IUGR (46.6%) and 1 was term, healthy baby. The overall perinatal morbidity and mortality was (46.6%) each.[21]

Lakshmi NK et al stated that, the perinatal deaths were 7 cases (46.6%)[21] comparable to Sibai BM(33.3%),[20] Liu et al (42%),[29] Visser W (14.1%),[27] Sowjanya et al 35.33%.[26]

Abramovici et al[30] suggested that low birth weight, low APGAR scores and intrauterine death rates were higher in HELLP syndrome cases than severe preeclampsia at <36 weeks of gestation. Yıldırım et al,[31] found that birth weight and gestational age at delivery were lower in infants of subjects with HELLP syndrome than in infants of those with severe preeclampsia. The percentage of oligohydramnios and of absent or reversed end diastolic flow, and the 5-min Apgar score, except FGR, were comparable among women with severe preeclampsia and HELLP syndrome. FGR was higher in subjects with severe preeclampsia than in those with HELLP syndrome.

The findings from this study underscore the paramount importance of early recognition and prompt management of HELLP syndrome. Given its association with severe feto-maternal outcomes, the study advocates for vigilant monitoring of pregnant women, especially those with known risk factors for preeclampsia. Early intervention, including the consideration of timely delivery, is critical to prevent the escalation of maternal and fetal complications. The study also calls for the development and adherence to standardized clinical protocols, ensuring that healthcare providers are equipped to manage this complex condition effectively.

CONCLUSION

The study provides a comprehensive examination of the profound and often life-threatening impacts this condition can have on both the mother and the fetus. The

study findings reveal that HELLP syndrome is associated with a high incidence of maternal complications, including liver dysfunction, renal failure, disseminated intravascular coagulation (DIC) and an increased risk of haemorrhage, which collectively contribute to maternal morbidity and in some cases, mortality. On the fetal side, the outcomes are equally alarming. The study highlights that HELLP syndrome often leads to preterm delivery, which is necessitated by the need to mitigate the risks posed to the mother. Preterm births are associated with a spectrum of neonatal complications, including respiratory distress syndrome (RDS), intraventricular haemorrhage (IVH) and long-term neurodevelopmental issues. Intrauterine growth restriction (IUGR) is also commonly observed increasing the perinatal mortality rate. The study concludes by emphasizing the crucial importance of early detection and aggressive management of HELLP syndrome to improve outcomes for both the mother and the fetus. This includes regular monitoring for signs of preeclampsia, rapid and accurate diagnosis of HELLP syndrome, and timely delivery, often before term, to prevent further deterioration of maternal and fetal conditions. The findings advocate for the implementation of standardized protocols in managing pregnancies complicated by HELLP syndrome, ensuring that healthcare providers are prepared to address the complex challenges posed by this condition. In essence, this study sheds light on the dire consequences of HELLP syndrome and underscores the need for heightened awareness, prompt medical intervention, and specialized care to reduce the adverse feto-maternal outcomes associated with this life-threatening condition.

ACKNOLEDGEMENTS

We thank to all professors and staff of Dr shankarrao Chavan government medical college, nanded.

We also thank all the patients who gave us consent to take part in the study.

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