

Original research article

A Study of Maternal Outcome in Case of HELLP and Partial HELLP Syndrome in a Tertiary Care Hospital - Kalaburagi

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Abstract

HELLP syndrome is a severe complication of pregnancy with high risk for both fetus and mother, some pregnant women develop just one or two of the characteristics of this syndrome which is called as partial HELLP syndrome. Maternal morbidity and mortality are due to consequences such as pulmonary oedema, renal failure, DIC, this study evaluates the maternal outcome in HELLP syndrome so that the management is improved resulting in reduced mortality and morbidity.

Objectives: This study was designed to understand maternal outcome in HELLP and Partial HELLP syndrome in pregnant women at GIMS hospital kalaburgi.

Methodology: This study is a Prospective analytical study conducted in OBG department in GIMS Kalaburgi from April 2021 to September 2021 (6 months).

Inclusion criteria: Antenatal women above 20 weeks gestation who fulfilled the criteria for HELLP and Partial HELLP syndrome were included in study.

Detailed history, clinical examination, BP measurement, Obstetric Examination, blood investigation were done and categorized by Mississippi Classification for better evaluation.

Maternal outcome were noted and subjected to Statistical analysis.

Exclusion criteria: all antenatal women with mild pre-eclampsia who does not fulfill the Lab criteria of HELLP syndrome.

Conclusion: Once diagnosis of HELLP syndrome is confirmed management depends on several obstetric and maternal variables like gestation age, severity of lab abnormalities, fetal status, early detection and prompt management of preeclampsia is the most important approach to prevent HELLP and Partial HELLP syndrome, we have to increase grass root level antenatal care.

Keywords: HELLP syndrome, Mississippi classification

Introduction

Hypertensive disorders of pregnancy complicate up to 10% of pregnancies and constitute one of the major causes of maternal and perinatal morbidity and mortality worldwide¹. The syndrome of hemolysis, elevated liver enzymes, and low platelets, otherwise referred to as HELLP syndrome, has historically been classified as a complication or progression of severe preeclampsia, some pregnant women develop just one or two of the characteristics of this

syndrome which is called as partial HELLP syndrome¹. The HELLP syndrome occurs in about 0.5 to 0.9% of all pregnancies and in 10 to 20% of cases with severe preeclampsia. In about 70% of the cases, the HELLP syndrome develops before delivery with a peak frequency between the 27th and 37th gestational weeks; 10% occur before the 27th week, and 20% beyond the 37th gestational week. The mean age of pregnant women with HELLP syndrome is usually higher than in women with preeclampsia. Two major guidelines are used for HELLP syndrome diagnosis based on haemolysis, elevated liver enzymes, and low platelet (PLT) count, namely, the Tennessee classification and Mississippi triple-class system. According to the Mississippi triple-class system, the severity of HELLP syndrome is mostly characterised by the amount of PLT²

Main diagnostic criteria of the HELLP syndrome

The Tennessee classification system diagnostic criteria for HELLP are:

- Hemolysis
- Increased LDH (> or =600 IU/L)
- Increased AST (>or =70 IU/L)
- Low platelets (< 100 x 10⁹/L)

The HELLP syndrome may be complete or incomplete.

Mississippi classification measures the severity of the syndrome using the lowest observed platelet count along with the other two main clinical criteria (LDH and AST). Class I is the more severe, with a relatively high risk of morbidity and mortality, compared to the other two classes. An ischemic-reperfusion injury starts the liver damage in HELLP syndrome, The spiral arteries which fail to remodel because of inadequate trophoblast invasion or defective endothelial apoptosis result in ischemia of the placenta. This causes activation of endothelium, which is accompanied by an increased release of antiangiogenic factors to cause hypertension and proteinuria. It may lead to multiorgan microvascular injury, which is the reason for liver damage in HELLP syndrome. In addition, abnormal oxidation of fatty acids by the fetus and release of metabolic intermediates into the mother's circulation causes liver and vascular dysfunction. This occurs when the fetus has an inherited defect in mitochondrial fatty acid oxidation. The inflammatory component includes an increase in leukocytes and pro-inflammatory cytokines with a reduction in anti-inflammatory cytokines³. The average gestational age of presentation of HELLP syndrome is 34 weeks. The majority of women with HELLP syndrome have hypertension and proteinuria prior to diagnosis. Patients are usually multiparous and over the age of 35 years old. Patients are often overweight and have edema in 50% of the cases. Many present with right upper quadrant or epigastric colicky pain with nausea and vomiting. This is usually preceded by malaise 1 to 2 days earlier. 30% to 60% also have a headache, and 20% have a visual disturbance. The condition exacerbates during the night. The symptoms continuously progress^{4,5}. Maternal morbidity and mortality are due to consequences such as pulmonary oedema, renal failure, DIC and sub capsular liver hematoma, this study evaluates the maternal outcome in HELLP syndrome so that the management is improved resulting in reduced mortality. The onset of HELLP Syndrome is rapid, variable and sometimes atypical, so the diagnosis is generally delayed for 5-7 days. Many of them are misdiagnosed with disorders, like cholecystitis, oesophagitis, gastritis, hepatitis, viral fever or idiopathic thrombocytopenia. Typical clinical symptoms are right upper quadrant pain abdomen or epigastric pain, nausea and vomiting. Pain abdomen may be colicky, intermittent associated with malaise few days before actually diagnosing it to be HELLP Syndrome

Methods

This is a Prospective analytical study conducted in OBG department in GIMS Kalaburgi for a period of 6 months i.e. April 2021 to September 2021, including 147 cases of severe preeclampsia and Eclampsia, out of which 46 cases developed HELLP and Partial HELLP Syndrome.

Inclusion criteria;

Antenatal women above 20 week gestation who fulfilled the criteria for HELLP and Partial HELLP syndrome were included in study

Exclusion criteria;

All antenatal women with mild pre-eclampsia who does not fulfill the Lab criteria of HELLP and Partial HELLP syndrome.

The selected cases were studied with history, clinical data and detailed laboratory investigations done including complete haemogram, peripheral blood smear, coagulation profile, liver profile, renal profile values which have been recorded and HELLP Syndrome cases were classified according to Mississippi classification. Mississippi classification is based on platelet count Nadir: Class I – Less than 50,000 per cubic Millimeter; Class II – >50,000 to less than 1,00,000 per cubic millimeter; Class III – >1,00,000 to 1,50,000 per cubic millimeter

RESULTS

In the present study of 6 months with 4255 admitted obstetric cases, 352 were preeclampsia cases, of which 147 were severe Preeclampsia and 32 were eclampsia, which were analyzed prospectively of which 46 cases were diagnosed as HELLP and partial HELLP Syndrome, of 46 cases 28 cases were of partial HELLP and 18 cases were of HELLP syndrome.

According to Mississippi classification,

Class I - 6 cases

class II – 17 cases

class III - 23 cases

Out of 46 cases of HELLP Syndrome, 38 cases (82%) were referred cases from Primary health center (Table 2)

Table 1: Mississippi classification (University of Mississippi 2006 criteria).³

Mississippi classification
Class I Platelet count $\leq 50,000/\text{mm}^3$ Sr.AST or Sr. ALT ≥ 70 IU/L Sr.LDH ≥ 600 IU/L
Class II Platelet count $> 50,000 - \leq 100,000/\text{mm}^3$ Sr.AST or Sr. ALT ≥ 70 IU/L Sr. LDH ≥ 600 IU/L
Class III Platelet count $> 100,000$ to $\leq 150,000/\text{mm}^3$ Sr.AST or Sr. ALT ≥ 40 IU/L Sr.LDH ≥ 600 IU/L

Table 2: No. of cases according to Mississippi classification

Total
Class I 6
Class II 17
Class III 23

60% cases were in the age group of 21-25 years .

In present study, 54% were primigravidae of which more of class II (48%) and about 46% were multigravida of which more of class III(61%). (Table 3)

Table 3: No. of cases according to gravida.

Gravida	Class I	Class II	Class III	Total
Primi(54%)	3	12	10	25
Multi(61%)	3	5	13	21

The most commonly observed feature is dizziness - 5 cases (33.3%), renal complications like oliguria, haematuria, renal failure - 3 cases (20%). Fever, malaise, body pains - 1 case (6.6%), Non specific symptoms 1 case (6.6%).

Table 4: No. of cases according to gestational age.

Gestational age (weeks)	No. of cases	Class II	Class III	Class III
28-32	4 (8.6%)	1	2	1
32-37	18(39%)	2	10	6
>37	24(52%)	3	5	16

Out of 46 cases of HELLP and Partial HELLP syndrome 4 cases were between 28 to 32weeks(8.6%) , and 8 cases were between 32-37 weeks (39%), 24 cases were more then 37 week (52%)

Table 5:Mode of delivery

Mood of delivery	Class I	Class II	Class III	Total
LSCS	2	9	13	24 (52.1%)
Vaginal delivery	4	8	10	22(47%)

Out of 46 cases of HELLP and Partial HELLP syndrome , 24 cases (52.1%) have undergone Lower segment cesarean section and 22 (47%) have delivered vaginally

Table 6: No. of cases according to laboratory findings.

AST >70IU/L	ALT >70IU/L	LDH >600IU/L	Sr. bilirubin >2mg/dl	Sr. uric acid >7mg/dl	Sr. creatinine >1.2mg/dl
6	6	11 (73.3%)	7 (40%)	5 (66.6%)	4(46.6%)

According to the investigations, laboratories threshold that indicate Out of 46 cases 6 had AST >70IU/L and 6 had ALT >70 I/L and 11 had LDH more then 600 IU/L and 7 had sr bilirbin >2mg/dl and 5 had sr.uric acid > 7 mg/dl and 4 had sr. Creatinine 1.2 mg/dl (Table 6)

Table 7: No. of cases according to platelet Count by Mississippi classification.

Total No. of cases	Class I (<50,000/mm ³)	Class II (50,000 to 1,00000/mm ³)	class III (>1,00000 TO 1,50000/mm ³)
46	6(13%)	17(36%)	23(50%)

According to platelet count by Mississippi classification out of 46 cases , 6 belong to Class1 (13%) and 17 belong to class 2(36%) and 23 belong to class 3 (50%) .(table 7)

Maternal morbidity in the form of Eclampsia, pulmonary edema, abruption PPH, Renal failure, pleural effusion, multiorgan failure etc. and 1 patient who underwent peripartum hysterectomy due to uncontrolled PPH and persistent, uncorrectable coagulopathy death occurred, on the whole 19.5% of maternal morbidity in 46 cases.

Table 8: Cases according to maternal outcome.

Complications	No. of cases	Class I	Class II	Class III
Heart failure				
Pulmonary edema	1	1	0	0
Severe anaemia	6	1	4	1
Abruption	1	1	0	0
PPH	4	2	2	0
PPH+ Eclampsia	1	0	0	1
Eclampsia	6	1	3	2
Multiorgan failure DIC+ARF				
	1	0	1	0
Haematuria+B/L Retinal Detachment	0	0	0	0
maternal death	2	1	1	

In 46 cases of HELLP and partial HELLP Syndrome, 20 cases(43.4%) developed various maternal complications, of which 1 case had multiorgan failure who died due to uncontrollable, persistent, uncorrectable coagulopathy with peripartum hysterectomy belonging to class II. Maternal morbidity is 19.5%, and maternal mortality is 4.36%. 10 cases (66.6%) have average birth weight of >2kg- 2.5kg of which 5 belonged to class III. In present study, 24 term deliveries (52.3%), of which 2 are IUFD. Preterm babies were 18 (39 .6%), 7 of them were born alive with IUGR. Total number of live births was 42/46 (91.3%); of which 18 babies were preterm with IUGR 7 (15.6%) and 2 were IUFD and 2 were still born . The overall perinatal morbidity (15.3%) and mortality was 5 (10.6%) each. The perinatal mortality rate is comparatively more than in the study by Sowjanya et al (35.33%). Birth asphyxia and prematurity were the commonest causes of perinatal mortality rates. In our study, 19.5% maternal morbidity and 4.3% maternal mortality is seen.

Table 9: Perinatal outcome.

Complications	Total No. of cases	Class I	Class II	Class III
Term	24	3	5	16
Preterm	18	2	10	6
IUGR	7	0	3	4
Birth asphyxia	4	2	2	0
Still births	2	0	1	1
Low APGAR	4	2	2	0
NICU admissions	6	2	2	2
IUFD	2	2	0	0

Table 10: Maternal and perinatal outcome.

Outcome	Total	Class I	Class II	Class III
Maternal morbidity	9/46 (19.5%)	3/46 (6.5%)	3/46 (6.5%)	3/46 (6.5%)
Maternal mortality	2/46 (4.3%)	1/46(2.1%)	1/46 (2.1%)	--
Perinatal morbidity	7/46 (15.2%)	--	3/46 (6.5%)	4/46 (8.6%)
Perinatal mortality	5/46(10.6%)	--	3/46 (6.5%)	2/46 (4.3%)

DISCUSSION

HELLP and Partial HELLP Syndrome is a life threatening complication, considered to be a severe variant of Preeclampsia and Eclampsia. The incidence of HELLP Syndrome in the present prospective study is 1.08% (46/4255cases) which is comparatively lesser, than in the study of Sowjanya² et al 15.5% and 6.5% in the study of Ara S et al.^{3,4} This may be due to better laboratory facility and better interpretation of Sibai's diagnostic Criteria. Early identification of risk factors in pregnancy and timely intervention gives better maternal and perinatal outcome. In the study of 46 cases of HELLP and Partial HELLP Syndrome, 39 from pre eclampsia and 7 from eclampsia were analyzed. In 46 cases, only 18 cases (39%) were booked comparable to 38.23% of booked cases of Ara S et al and 52.64% of Sowjanya et al studies, Sibai⁷ BM (21%), Isler CM⁸ et al 32.8% and 60.36% (28 cases) were unbooked in the study.^{5,6} Our study had 32 (82%) referral cases. 25 cases (54%) belonged to Primi gravida and 21 cases (61%) belonged to multi parous women. All 46 cases (100%) were antepartum which was comparatively higher than in of Ara S et al 75% and majority, 18 cases (39%) of them were between >32 and 37 gestational weeks comparable to Vigil-de Gracia P 40%.⁹ In all these cases studied, 22 (47%) were delivered vaginally and 24 cases (51.6%) were delivered by caesarean section. The main complications were DIC, renal failure, pulmonary edema, abruption, multi organ failure, PPH, eclampsia. The outcome of HELLP and partial HELLP Syndrome depends on the severity, timely intervention, availability of tertiary care facilities like ICU, dialysis, ventilatory support and equipment and availability of blood and blood products. In this study, 9 cases (19%) needed intensive care management; of which 7 cases were discharged home healthy and 2 case death occurred. All 9 cases (60%) were treated with FFP, platelet transfusion and other blood products. In the present study, the maternal mortality was 2 (4.3%) because of late referral in bad condition. It is comparable to Sibai BM et al (1.8%), Isler CM et al (7.8%), Vigil-de Gracia P (2.3%), Sowjanya et al (4.5%), Magann EF et al (23.2%), Visser W et al (14.1%).⁷⁻⁸

The perinatal deaths were 5 cases (10.6%) comparable to Sibai BM(33.3%), Magann EF et al (23.2%), Liu et al (42%), Visser W (14.1%), Sowjanya et al 35.33%.⁸⁻¹⁰ The main cause for perinatal deaths in OUR study was prematurity (86.6%) comparatively higher than in Ara S

49.62%, Sowjanya et al 35.33% followed by birth Asphyxia .The still birth rate in the present study was 2 cases(13.33%). Expectant management, appropriate intervention, NICU facility will improve the perinatal outcome. In our present study, vaginal delivery was done in 22 cases as they were in labour. In 13 cases, active management was taken in the form of termination of pregnancy by caesarean section irrespective of gestational age as delivery is the definitive management to prevent further complications and to save the mother, remaining 11 cases were pre-LSCS . Caesarean section rate in the present study was 24 cases (52%). It is comparable to 71% of Vigil-de Gracia P, 63% Hadded O et al.^{7,11}

CONCLUSION

Early registration and regular antenatal checkups play a major role in early diagnosis and classification of HELLP and partially HELLP Syndrome¹⁶. Availability of better transport facilities and prompt referral is essential. HELLP Syndrome must be treated in tertiary care center as it is one of the dreadful obstetric complication which needs multidisciplinary team approach, availability of life saving facilities like mechanical ventilators, dialysis equipment and blood products neonatal care facilities. For this reason, obstetrician at any level should be attentive, alert and need to improve quality care and make efforts for early identification even at its atypical presentation and should be able to provide skilled management techniques till the case is shifted to tertiary care center. The Global mortality rate of HELLP Syndrome has been reported to be as high as 25%.¹⁰ That's why it is critical for expecting mothers to be aware of the condition and its symptoms, so they can receive early diagnosis and treatment. Doctors should enhance their skills in antenatal care to identify high risk factors at primary health centre and community health centre.

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