



## HELLP SYNDROME: A MULTISYSTEMIC DISORDER AND ITS IMPLICATIONS ON FETO-MATERNAL OUTCOME

### Obstetrics & Gynaecology

**Dr. Yesha**

**Umbharatwala**

2nd year resident, Department of Obstetrics and Gynecology, Civil Hospital, Ahmedabad.

**Dr. Mahima Jain\***

Professor and Head of Unit, Department of Obstetrics and Gynecology, Civil Hospital, Ahmedabad.\*Corresponding Author

### ABSTRACT

**OBJECTIVE** The objective of this study was to evaluate the repercussions on maternal and perinatal outcomes amongst the women who developed HELLP syndrome either as a complication of eclampsia and preeclampsia or due to any other underlying multisystemic pathology. An observational, prospective, analytic study was done in a tertiary care hospital of Gujarat-Civil Hospital, Ahmedabad from June 2019 to January 2020.

**MATERIALS AND METHODS** A Prospective study was done in department of Obstetrics and Gynecology in civil hospital; Ahmedabad from period of June 2019 to January 2020 to re-evaluate in regard of symptoms, treatment options and fetomaternal prognosis.

**RESULTS** There were 2949 antenatal admissions during the course of study. Out of these 2949, 352 patients had preeclampsia /eclampsia with incidence of 11.93%. 8 patients (2.3%) had all the features of HELLP syndrome and 26 (7.9%) had partial HELLP syndrome. Mean age of all the patients with HELLP syndrome was 25.33±5.00 years. Mean gestational age of all the patients with HELLP syndrome was 36.33±3.62 weeks. Mean systolic and diastolic blood pressure of all the patients with HELLP syndrome was 163.21±18.57 mmHg and 109.32±9.16 mmHg respectively. Majority of the patients had complications associated with HELLP syndrome. Out of 8 patients of complete HELLP, 4 (50%) patients died. Among partial HELLP patients, 2 maternal deaths were seen (7.67%). Perinatal mortality rate among all the patients of HELLP syndrome was 36.5%.

**CONCLUSION** HELLP syndrome can be an extremely serious and complex multisystem disorder involving much more than just eclampsia and preeclampsia. Special considerations are to be taken in obstetric management as well as in intensive neonatal care to minimize the maternal and perinatal morbidity and mortality.

### KEYWORDS

Complete HELLP syndrome, Partial HELLP syndrome, Maternal Outcome, Prematurity, IUGR, Perinatal outcome, IUD.

### INTRODUCTION:

HELLP syndrome is one of the serious complication of preeclampsia with high risk for the mother and the fetus and is characterized by hemolysis, elevated liver enzymes and low platelet count. It was first suggested by Weinstein in 1982.<sup>1</sup>

This syndrome in general complicates 0.2-0.6% of all pregnancies but its incidence increases to 4-12% in severe preeclampsia.

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 the 27th week and 20% beyond 37th gestational week.<sup>2</sup> In the postpartum period the HELLP syndrome usually develops within 48 hours in women with hypertensive disorder of pregnancy. Although variable, the onset of the HELLP syndrome is usually rapid.<sup>3</sup> Majority of women with this syndrome have had hypertension and proteinuria, which may be absent in 10-20% of the cases.<sup>4</sup> Excessive weight gain and generalized edema precede the syndrome in more than 50% of the cases. The presentation of patients with HELLP syndrome is variable. The patients may have symptoms from flu like illness to gastrointestinal hemorrhage.<sup>5</sup> 90% of patients experience malaise, fatigue, and nonspecific complaints for a few days seeking medical evaluation. The ominous symptom of epigastric or right upper quadrant pain is present only in half to two-thirds of patients.<sup>6,7</sup>

There are two major classifications for diagnosing HELLP syndrome i.e.

- 1) Tennessee classification
- 2) Mississippi classification (Class 1, 2 and 3).

Diagnosis of the complete HELLP syndrome requires the presence of all 3 major components while partial or incomplete HELLP syndrome consists of only 1 or 2 elements of the triad.

Diagnosis of HELLP syndrome is an indication for immediate delivery if pregnancy is  $\geq 34$  weeks or at any gestational age if pulmonary edema, placenta abruption, non-reassuring fetal status and uncontrollable hypertension is present. All other cases require administration of magnesium sulfate, steroids and delivery within 24 hours after the second steroid dose.<sup>8</sup> Maternal and fetal condition, gestational age, bishops score, inducibility of the cervix are few factors which may be factors deciding mode of delivery.

This prospective study was conducted in the department of Obstetrics and Gynecology, Civil Hospital, Ahmedabad from June 2019 to January 2020 to re-evaluate in regard of symptom, treatment opinions and fetomaternal prognosis.

Informed consent was taken from each patient prior to the start of the study. Total numbers of antenatal admissions during the course of study were recorded. The mothers suffering from hypertensive disorders of pregnancy were selected. Further, these patients were classified into different classes of hypertensive disorders of pregnancy. The patients who suffered from preeclampsia –eclampsia were studied and looked for the complication of HELLP syndrome.

### METHODOLOGY:

A Prospective study was done in department of Obstetrics and Gynecology in civil hospital; Ahmedabad from period of June 2019 to January 2020 to re-evaluate in regard of symptoms, treatment options and fetomaternal prognosis. They were divided in 2 groups as mentioned below.

**1. Group A (study group):** included 100 patients suffering from hypertensive disorders of pregnancy with preeclampsia and eclampsia. It was further subdivided into the following subgroups:

Subgroup A: Mild preeclampsia-patients with systolic blood pressure less than 160 mm Hg and diastolic blood pressure less than 110 mm Hg.

Subgroup B: Severe preeclampsia-patients with systolic blood pressure  $\geq 160$  mm Hg and diastolic blood pressure  $\geq 110$  mm Hg.

Subgroup C: Eclampsia Atypical preeclampsia

**2. Group B (control group):** included 100 normotensive antenatal patients.

Women were subjected to detailed history taking, clinical examination, presence of albumin in urine, hemoglobin, and platelet count and biochemical investigations. Labour was monitored and mode of delivery was noted. Patients were

Subjected to repeat biochemical investigations; hemoglobin level and platelet count in the postpartum period after 48 hours. Preeclampsia

and eclampsia patients complicated with HELLP syndrome with its implications on maternal and perinatal outcome were noted.

Maternal outcome was measured in terms of age of mother, parity, socioeconomic status, period of gestation, severity of preeclampsia, eclampsia, class of HELLP syndrome, mode of delivery, need for blood products, maternal complications like pulmonary edema, acute renal failure, abruptio placenta, disseminated intravascular coagulation, postpartum hemorrhage and maternal mortality.

Perinatal outcome was measured in terms of prematurity, immaturity, intrauterine fetal demise, birth asphyxia, APGAR score, neonatal jaundice, hypoglycemia, hypocalcemia, sepsis, NICU admission and early neonatal death. Baby was followed up to 7 days after birth.

**RESULTS:**

There were 2949 antenatal admissions during the course of study. Out of these 2949 total 352 patients had preeclampsia /eclampsia with incidence of 11.93%. 8 patients (2.3%) had all the features of HELLP syndrome and 26 (7.9%) had partial HELLP syndrome.

**Table 1: Clinical profile of the patients with HELLP syndrome.** Mean age of all the patients with HELLP syndrome was 25.33±5.00 years comparable with the study conducted by Bang NO i.e. 27+31±5.00 years.<sup>10</sup> Among the partial HELLP syndrome, majority of the patients had severe preeclampsia (33.33%), 25.4% had atypical preeclampsia with no proteinuria, 22.22% were with eclampsia and 19.05% had mild preeclampsia.

| Symptoms            | Partial HELLP(n=26) |     | Complete HELLP(n=8) |     |
|---------------------|---------------------|-----|---------------------|-----|
| Severe headache     | 13                  | 50% | 3                   | 37% |
| vomiting            | 7                   | 26% | 3                   | 37% |
| Epigastric pain     | 4                   | 15% | 5                   | 62% |
| Visual disturbances | 10                  | 38% | 4                   | 50% |

**Table 2: Lab investigations at the time of admission and 48 hours after delivery.**

|                                | Partial HELLP |            | Complete HELLP |            |
|--------------------------------|---------------|------------|----------------|------------|
|                                | Antepartum    | Postpartum | Antepartum     | Postpartum |
| Mean Hb(gm/dl)                 | 8.19          | 8.56       | 5.97           | 8.03       |
| Mean platelet count (lac/cumm) | 1.58          | 1.8        | 0.66           | 0.77       |
| Mean Billirubin (mg/dl)        | 1.43          | 0.95       | 2.48           | 2.16       |
| Mean SGOT (IU/L)               | 58            | 50         | 93             | 74         |
| Mean SGPT(IU/L)                | 60            | 49         | 97             | 67         |

Among complete HELLP patients, 4 (50%) had severe preeclampsia, 2 (25%) had atypical preeclampsia, 1 patient (12.5%) had eclampsia and 1 patient (12.5%) was with mild preeclampsia. 30.16% patients of partial HELLP had only elevated liver transaminases, 31.75% only low platelet count, 4.76% had both elevated liver enzymes. Majority of the patients were primi gravida<sup>11</sup> i.e. 63.49% in partial HELLP and 62.5% in complete HELLP syndrome. In group 2, primi gravidae and multigravida were 50% each (p=0.05).

Mean gestational age among partial HELLP syndrome patients was 36.34±3.75 weeks and among complete HELLP patients was 36.32±2.60 weeks and comparable with the study conducted by Kaur AP et al i.e. 36.06±3.50 weeks in partial HELLP and 35.00±4.3589 weeks in complete HELLP syndrome.<sup>12</sup> Mean systolic and diastolic blood pressure in all the patients with HELLP syndrome was 163.21±18.5 mmHg and 109.32±9.16 mmHg comparable with mean systolic and diastolic blood pressure in the study by Chawla S et al i.e. 166±18.65 and 110.5±12.7 mmHg, respectively.<sup>13</sup> The mean platelet count in the patients with complete HELLP in the present study was 0.668±0.40 lacs/cumm comparable with the study by Osmanagaoglu MA et al i.e. 62,676±38,333.37/cumm.<sup>14</sup>

**Mode of delivery:**

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. Among group 2, 68.5% had vaginal delivery and 31.5% underwent cesarean section (p=0.04). Perinatal mortality rate among all the HELLP syndrome patients was 43.7%.

Majority of the patients had complications associated with HELLP syndrome. Out of 8 patients of complete HELLP, 4 (50%) patients died. Among partial HELLP patients, 2 maternal deaths were seen (7.67%). The cause of death in case of maternal mortality was disseminated intravascular coagulation+ septicemia+ acute renal failure (DIC+SEPTICEMIA+AKI) and other related consequences.

**Table 3: Maternal complications:**

|                    | Partial HELLP(n=26) |       | Complete HELLP(n=8) |       | Group 2(n=100) |
|--------------------|---------------------|-------|---------------------|-------|----------------|
| PPH                | 3                   | 4.5%  | 2                   | 25%   | 7(2.3%)        |
| DIC                | 2                   | 2.63% | 3                   | 37.5% | 0              |
| Abruption placenta | 8                   | 13.8% | 2                   | 25%   | 0              |
| Pulmonary edema    | 3                   | 7.94% | 2                   | 25%   | 0              |
| Renal shutdown     | 3                   | 6.35% | 4                   | 50%   | 0              |
| Maternal death     | 2                   | 13%   | 4                   | 50%   | 0              |

**Table 4: Perinatal complications:**

|                      | Partial HELLP(n=26) |        | Complete HELLP(n=8) |       | Group 2(n=100) |      |
|----------------------|---------------------|--------|---------------------|-------|----------------|------|
| prematurity          | 6                   | 23.71% | 4                   | 50%   | 6              | 3%   |
| Respiratory distress | 8                   | 30.16% | 4                   | 50%   | 6              | 3%   |
| IUGR                 | 8                   | 34.5%  | 3                   | 37.5% | 1              | 0.5% |
| IUD                  | 7                   | 31.75% | 3                   | 37.5% | 3              | 1.5% |
| Neonatal death       | 3                   | 11.5%  | 2                   | 25%   | 2              | 0.5% |

**DISCUSSION:**

HELLP syndrome is a multisystemic disorder with incidence of 0.17-0.85% of all pregnancies. It is characterized by thrombocytopenia, microangiopathic hemolysis and altered liver function, considered as a consequence of microvascular endothelial activation and cell injury. Although its etiopathogenesis is still not completely understood, One school of thought for its occurrence is due to change in immune fetomaternal balance, platelet aggregation, endothelial dysfunction, arterial hypertension, and error of fatty acid oxidative metabolism and hepatic involvement that occurs by intravascular fibrin deposition and hypovolemia.

HELLP syndrome should be considered on any pregnant patient presenting beyond 34 weeks of gestation or immediately postpartum with significant new onset epigastric pain until proven otherwise. To meet diagnostic criteria

- 1) Elevated liver enzymes (AST/ALT)>70IU/L
- 2) Total serum LDH>600IU/L
- 3) Platelet count<1 lac/mm3

A prospective study was done in department of Obstetrics and Gynecology in civil hospital; Ahmedabad from period of January 2019 to July 2019 to re-evaluate in regard of symptoms, treatment options and fetomaternal prognosis.

Hemolysis may be indicated by elevated total bilirubin(>1.2 mg/L), LDH and AST elevations, characteristic findings in peripheral smear (schistocytes), hematuria and worsening of anemia. Maternal morbidity here can be explained by acute renal failure, hepatic infarct, hepatic hematoma, hepatic rupture, disseminated intravascular coagulation, postpartum hemorrhage pulmonary edema and rarely liver cell failure. The rate of mortality in any of these severe complications is higher. Perinatal morbidity and mortality here can be explained due to prematurity that leads to neonatal birth asphyxia and its consequences.

**CONCLUSION:**

HELLP syndrome can be an extremely serious and complex multisystem disorder involving much more than just eclampsia and preeclampsia. Special considerations are to be taken in obstetric management as well as in intensive neonatal care to minimize the maternal and perinatal morbidity and mortality.

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