Maternal and Perinatal Outcome in Patients with HELLP Syndrome

By Rohit Chandrakant Kamble & Nilima. S. Gupte

Abstract - HELLP syndrome (haemolysis, elevated liver enzymes, and low platelets) is a component of hypertensive disorders of pregnancy which is associated with significant maternal as well as perinatal morbidity and mortality. Maternal mortality is due to consequences such as pulmonary oedema, renal failure, disseminated intravascular coagulation and subcapsular liver hematoma. Perinatal mortality appears to be primarily related to the gestational age at the time of delivery. This study evaluates the maternal and perinatal outcome in HELLP syndrome so that the management is improved resulting in reduced mortality and morbidity.

Objectives: A. To study maternal outcome in patients diagnosed with HELLP syndrome. B. To study perinatal outcome in patients with HELLP syndrome.

Keywords: HELLP syndrome, maternal and perinatal outcome.

GJMR-E Classification: NLMC Code: WQ 210

Strictly as per the compliance and regulations of:
Maternal and Perinatal Outcome in Patients with HELLP Syndrome

Rohit Chandrakant Kamble & Nilima. S. Gupte

Abstract- HELLP syndrome (haemolysis, elevated liver enzymes, and low platelets) is a component of hypertensive disorders of pregnancy which is associated with significant maternal as well as perinatal morbidity and mortality. Maternal mortality is due to consequences such as pulmonary oedema, renal failure, disseminated intravascular coagulation and subcapsular liver hematoma. Perinatal mortality appears to be primarily related to the gestational age at the time of delivery. This study evaluates the maternal and perinatal outcome in HELLP syndrome so that the management is improved resulting in reduced mortality and morbidity.

Objectives: A. To study maternal outcome in patients diagnosed with HELLP syndrome. B. To study perinatal outcome in patients with HELLP syndrome.

Methods: This study was conducted in department of obstetrics and gynaecology of medical college and tertiary health care centre. A consecutive series of 56 pregnant women above 24 weeks of gestational age with HELLP syndrome were admitted at a tertiary care hospital, during the period of 24 months from 30th November, 2015 to 31st October, 2017. History, clinical data, detailed laboratory investigations were studied and categorized by Mississippi classification for better analysis of complication and outcome in HELLP syndrome.

Results: Total 56 cases of HELLP syndrome were studied. Majority of the patients were primigravidae belonging to lower socio-economic status, which were unbooked with no proper antenatal care. 60.71% of the patients had maternal complications. The complications were severe anemia in 21.43%, renal complication in 21.43%, DIC in 19.64%, abruption 14.29%, respiratory complication 7.15%, ascites 3.57% and septicemia in 3.57% and maternal mortality rate was 14.28%. A high incidence of perinatal morbidity and mortality appears to be primarily related to the gestational age at the time of delivery.

Conclusion: HELLP syndrome is associated with increased maternal and perinatal morbidity and mortality. Once diagnosis is made, it warrants aggressive intervention with control of blood pressure, antiseizure prophylaxis and corticosteroid treatment and delivery. We have to increase grass root level antenatal care. Early detection and prompt management of pre-eclampsia is the most important approach to the prevention of HELLP syndrome.

Keywords: HELLP syndrome, maternal and perinatal outcome.

I. Introduction

Every woman wishes to have a healthy pregnancy which culminates in a healthy baby and a healthy mother. Unfortunately, some women develop dreaded complications that may result in adverse obstetric outcomes. These include Hypertensive disorders of pregnancy, Pre-eclampsia, Eclampsia and HELLP syndrome1. Pre-eclampsia occurs in 5-10% of pregnancies. The HELLP syndrome (haemolysis, elevated liver enzymes, and low platelets) is a variant of severe pre-eclampsia that is associated with significant maternal and perinatal morbidity and mortality2. HELLP syndrome develops in 6-12% of women with preeclampsia or eclampsia accounting for 0.4-0.7% of all pregnancies. Maternal mortality is due to consequences such as pulmonary oedema, renal failure, disseminated intravascular coagulation and subcapsular liver hematoma. Perinatal mortality appears to be primarily related to the Maternal and Perinatal Outcome in Patients with HELLP Syndrome gestational age at the time of delivery. HELLP syndrome is regarded as high risk for the mother and neonate compared to pre-eclampsia. Early diagnosis and identification of complication of HELLP syndrome and timely intervention form the main strategy of management.

II. Aims and Objectives of the Study

- To study maternal outcome in patients diagnosed with HELLP syndrome
- To study perinatal outcome in these patients with HELLP syndrome.

III. Methodology

This was prospective observational study done over a period of 24 months i.e., Nov. 2015 to Oct. 2017. Total 56 cases of HELLP syndrome were studied. This study was conducted in department of obstetrics and gynaecology of medical college and tertiary health care centre

a) Inclusion Criteria

- All antenatal patients with pre-eclampsia and eclampsia complicated with HELLP syndrome.

b) Exclusion Criteria

- All patients with chronic hypertension
Patients with any systemic illness
Patients with hematological disorders
Patients with renal and liver disorders
Patients with autoimmune disorders

56 patients who were diagnosed as HELLP syndrome complicating preeclampsia and eclampsia were included in the study after satisfying inclusion and exclusion criteria. Written informed consent was taken from patients. After admitting the patients detailed history, complete general examination, systemic and obstetric examinations was done. Laboratory investigations for confirmation of HELLP syndrome and preeclampsia were done.

HELLP syndrome cases were classified according to mississippi classification

**c) Mississippi Classification (University of Mississippi 2006 Criteria)**

| Class | Platelet < 50,000/mL | AST or ALT > 70 IU/L | LDH > 600 IU/L |
|-------|----------------------|----------------------|---------------|
| Class I |                      |                      |               |
| Class II | Platelet 50,000-1,00,000/mL | AST or ALT > 70 IU/L | LDH > 600 IU/L |
| Class III | Platelet 1,00,000-1,50,000/mL | AST or ALT > 40 IU/L | LDH > 600 IU/L |

**IV. Results**

The following data was obtained from the present series of 56 cases studied at tertiary care hospital, in department of obstetrics and gynaecology from 30th November, 2015 to 31st October, 2017.

**Table 1: A classification of HELLP as per Mississippi’s classification Class**

| Class | No of Patients | Percentage |
|-------|----------------|------------|
| Class 1 | 10 | 17.86% |
| Class 2 | 23 | 41.07% |
| Class 3 | 23 | 41.07% |
| Total | 56 | 100.00% |

Majority of the cases belonged to class II and class III HELLP, 23 each (41.07%) followed by class I HELLP, 10 (17.86%).

48.21% of cases were in the age group 20-24 years (Table 2).

**Table 2: No. of cases according to age group**

| Age Group in years | Class 1 | Class 2 | Class 3 | Total | %  |
|--------------------|---------|---------|---------|-------|----|
| < 20               | 2       | 3       | 5       | 10    | 17.86% |
| 20-24              | 4       | 13      | 10      | 27    | 48.21% |
| 25-29              | 1       | 7       | 6       | 14    | 25.00% |
| 30-34              | 2       | 0       | 2       | 4     | 7.14%  |
| >35                | 1       | 0       | 0       | 1     | 1.79%  |
| Grand Total        | 10      | 23      | 23      | 56    | 100.00% |

In present study majority of the patients presented with severe preeclampsia and there were 20 cases (35.71%) with mild pre-eclampsia.

**Table 3: No. of cases according to parity**

| Gravida/Para | Class 1 | Class 2 | Class 3 | Total | %  |
|--------------|---------|---------|---------|-------|----|
| Primi        | 5       | 12      | 16      | 33    | 58.93% |
| Multi        | 5       | 11      | 7       | 23    | 41.07% |
| Total        | 10      | 23      | 23      | 56    | 100.00% |

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

| Class  | Total | %  |
|--------|-------|----|
| < 28 weeks | 3     | 16.07% |
| 29-32 weeks | 1     | 14.28% |
| 33-36 weeks | 3     | 26.78% |
| >37 weeks | 3     | 42.85% |

In present study majority of the patients presented with severe preeclampsia and there were 20 cases (35.71%) with mild pre-eclampsia.

**Table 5: Distribution of cases according to severity of hypertension**

| Clinical signs | Class 1 | Class 2 | Class 3 | Total | %  |
|---------------|---------|---------|---------|-------|----|
| BP Mild       | 2       | 8       | 10      | 20    | 35.71% |
| Severe        | 8       | 15      | 13      | 36    | 64.29% |
Maximum patients i.e., 58.92% of HELLP syndrome had platelet count less than 1 lakh/ml. Serum lactate dehydrogenase was raised in all patients with HELLP syndrome. All patients with HELLP syndrome had raised serum AST was 70 IU/L. 55.36% (31 cases) had bilirubin levels > 1.2 mg/dl while 44.64% (25 cases) had bilirubin levels < 1.2 mg/dl. 25% (14 cases) had abnormal renal function parameters. 67.86% (38 cases) had serum uric acid levels > 6 mg/dl. 33 cases (58.93%) required transfusion of blood or components while 23 cases (41.07%) did not require any blood and blood products.

Table 6: No. of cases according to laboratory investigations

|                | Class 1 | Class 2 | Class 3 |
|----------------|---------|---------|---------|
| platelet       | 10      | 23      | 23      |
| LDH >600 IU/L  | 25      | 20      | 11      |
| AST/>70 IU/L   | 30      | 16      | 10      |
| UA>6mg         | 8       | 15      | 15      |
| Bilirubin >1.2 | 8       | 14      | 9       |
| Srcreat >1.2mg/dl | 5     | 4       | 5       |

Table 7: Distribution of cases according to blood and blood products

| Blood and blood products | Transfusion       | Class 1 | Class 2 | Class 3 | Grand Total |
|--------------------------|-------------------|---------|---------|----------|-------------|
| Not Transfused           | 0                 | 8       | 15      | 23       | 41.07%      |
| Transfused               | 10                | 15      | 8       | 33       | 58.93%      |
| Grand Total              | 10                | 23      | 23      | 56       | 100.00%     |

Table 8: Cases according to maternal outcome

|                | Class 1 | Class 2 | Class 3 | Total | %     |
|----------------|---------|---------|---------|-------|-------|
| Anemia         | 4       | 5       | 3       | 12    | 21.43%
| Pum edema      | 1       | 1       | 0       | 2     | 3.57%
| Resp infection | 1       | 1       | 0       | 2     | 3.57%
| Oliguria       | 1       | 1       | 0       | 2     | 3.57%
| Hematuria      | 1       | 1       | 1       | 3     | 5.36%
| Renal failure  | 4       | 3       | 0       | 7     | 12.50%
| Abruption      | 4       | 3       | 1       | 8     | 14.29%
| DIC            | 8       | 3       | 0       | 11    | 19.64%
| Ascites        | 0       | 1       | 1       | 2     | 3.57%
| sepsis         | 1       | 1       | 0       | 2     | 3.57%
| Death          | 2       | 4       | 2       | 8     | 14.28% |

Table 9a: Perinatal outcome

|                | Class 1 | Class 2 | Class 3 | Grand Total | %    |
|----------------|---------|---------|---------|-------------|------|
| Pre Term       | 11      | 10      | 5       | 26          | 46.43%
| APGAR <6       | 16      | 12      | 7       | 35          | 62.50%
| IUGR           | 9       | 7       | 1       | 17          | 30.36%
| MAS            | 3       | 2       | 2       | 7           | 12.50%
| Sept           | 0       | 1       | 0       | 1           | 1.79%
| NICU admission | 11      | 10      | 4       | 25          | 44.64% |

Table 9b: Perinatal outcome

|                | Class 1 | Class 2 | Class 3 | Total | %    |
|----------------|---------|---------|---------|-------|------|
| Live birth     | 6       | 17      | 13      | 36    | 64.29%
| Still birth    | 3       | 5       | 6       | 14    | 25.00%
| IUFD           | 1       | 1       | 4       | 6     | 10.71%
| END            | 1       | 3       | 2       | 6     | 10.71%
| Take home      | 5       | 14      | 11      | 30    | 53.57%

V. Discussion

HELLP syndrome is life threatening complication considered to be variant of preeclampsia and eclampsia. Early identification of risk factors in pregnancy and timely intervention gives better maternal and perinatal outcome. In our study mean maternal age was 23.09 ± 4.45 (18-35 years) which was comparable to James N Martin et al., (1991) 22.9 ± 5.5 (14-42 years). Majority of the patients in the present study were primigravidae (33 cases) 58.93% comparable to Sibai BM Taslim et al., (1986) 52% and Martin JN et al., (1999) 51%.

Systolic BP in this study was class I 138±4, class II 151±18 and class III 175±12 which were comparable to Martin JN et al., class I 156±24, class II 158±22 and class III 163±19.
Majority of the patients in this study delivered vaginally 83.93% which was higher than Vigil P de Gracia 7 29% and Shafika Banoo 15 60%.

**Table 10: Maternal outcome**

| Complications         | Imir GA 16 | Vigil P de Gracia 7 | Fernazdez 11 | Hadded et al 12 | Ahmed et al 13 | Present study |
|-----------------------|------------|---------------------|---------------|-----------------|----------------|---------------|
| DIC                   | 17%        | -                   | 38%           | 8%              | 62.5%          | 19.64%        |
| Respiratory           | 25%        | -                   | 1.1%          | 10%             | -              | 7.15%         |
| ARF                   | 25%        | 12%                 | 4%            | 5%              | 18.75%         | 12.5%         |
| Ascites               | 14%        | -                   | -             | 5%              | -              | 3.57%         |
| Abruptio placenta     | 10.9%      | 12%                 | 28%           | 10%             | 25%            | 14.29%        |
| Hematuria             | 4.6%       | 22%                 | -             | -               | -              | 5.36%         |
| Sepsis                | 3.1%       | -                   | -             | -               | -              | 3.57%         |

Majority of the HELLP were full term i.e., gestational age >37 weeks (42.85%) comparable to Vigil P de Gracia 7 40%.

**Table 11: Perinatal outcome**

| Complications          | Kim YH 6 | Sibai BM et al 14 | Svendson HK 14 | Imir GA 16 | Present study |
|------------------------|----------|-------------------|----------------|------------|---------------|
| NICU admission         | 85.7%    | 28.3%             | -              | -          | 44.64%        |
| Preterm                | -        | -                 | 70%            | -          | 46.43%        |
| IUGR                   | 47.6%    | 31.6%             | 38.6%          | 54.7%      | 30.36%        |
| Still birth            | -        | 19.5%             | -              | -          | 25%           |
| IUD                    | 4.8%     | 28.5%             | -              | 18.8%      | 10.71%        |
| APGAR <6               | 66.7%    | 38.1%             | 19.5%          | 23.4%      | -             |
| RDS                    | 38.1%    | -                 | 40%            | 20.3%      | 10.71%        |
| Sepsis                 | 85.7%    | -                 | -              | 7.8%       | 1.79%         |
| Neonatal death         | 19.5%    | 17.4%             | -              | 20.3%      | 10.71%        |

Cesarean delivery in present study was 16.07% which was lesser than Vigil P de Gracia 7 71% and Shafika Banoo 16 40% and Hadded et al., 12 63%. Majority of the indication for cesarean section were fetal distress, CPD, previous cesarean section and worsening maternal parameters with failed induction.

In this present study transfusion of bold and blood products was required in 58.93% which was comparable with Imir GA 16 62.5% and higher than Vigil P de Gracia 7 29%.

In the present study, DIC 19.64% was lesser than Ahmed et al., 13 62.5%, Fernandez 11 38.1%, but higher than Hadded et al., 12 8%. Abruptio in the present study 14.29% was comparable to Hadded et al., 12 10%, Imir GA10 10.9%, Vigil P de Gracia 7 12%, but lesser than Ahmed et al., 13 25% and Fernandez 11 28%. This is because of early recognition and prompt treatment of severe preeclampsia with HELLP. Acute renal failure in the present study 12.5% was comparable to Hadded et al., 12 5%, Fernandez 11 4%, but lesser than Imir GA 16 25%,
Ahmed et al., 1318.75% and Vigil P de Gracia7 12%. Ascites in the present study was 3.57% comparable to Hadded et al.,12 5%, but lesser than Imir GA10 14%. Sepsis in the present study was 3.57% comparable to Imir GA10 of 3.1%.

In this present study, maternal mortality was 14.28% and was higher than Imir GA10 7.8% and Ahmed et al.,13 6.25%. It is higher than Hadded et al.,12 1%, Vigil P de Gracia7 2.3%, Haram K et al.,14 2.5% and Sibai BM2 1.8%.

In this present study, preterm babies were 26 i.e 46.43% was lesser than Svendson H14 70%.

For APGAR ≤6, 62.5% in this study was comparable to Kim YH6 66.7%, IUGR 30.36% comparable to Sibai et al.,3 31.6%, still birth 25% comparable to Sibai et al.,2 19.5%. Neonatal death in this study 10.71% was comparable to Sibai et al.,2 17.4%. IUD 10.71% in this study was lesser than Imir GA10 18.8% and higher than Kim YH6 4.8%.

In this present study, perinatal mortality (46.43%) was comparable to Gul et al.,16 42%, but higher than Sibai BM2 33.3%, Magann EF et al.,17 23.2% and Willey Visser18 14.1%. Majority of the causes of Perinatal mortality in our study were prematurity (46.43%), still birth (25%), SGA (30.36%) and birth asphyxia (83.33%).

VI. Conclusion

In our study done over a period of 2 years, there were 56 cases of HELLP syndrome. Once the diagnosis of HELLP syndrome has been made, it warrants aggressive intervention with control of blood pressure, antiseizure prophylaxis, corticosteroid treatment for fetal lung maturity and expeditious delivery. HELLP syndrome, among pre-eclampsia and eclampsia cases is associated with significant maternal morbidity and mortality and perinatal mortality and morbidity. The present study shows maternal mortality of 14.28% but still perinatal mortality constitutes 46.43%. In order to reduce the maternal and perinatal mortality, It is highly desirable that obstetric care providers at all levels become knowledgeable about the early diagnosis and management of HELLP syndrome.

We have to intensify our efforts to reduce preeclampsia with HELLP syndrome from the grass root level with regular antenatal care, early detection of preeclampsia and its prompt management and early detection of complications with timely intervention. This will go a long way in preventing this catastrophic disease.

Vigilant fetal monitoring (including electronic fetal monitoring), prompt timely intervention at the periphery and improvement of neonatal care facilities with good prenatal care at the foremost are needed to reduce the perinatal mortality in the present study.
liver enzymes and low platelet) syndrome. Am J Obstet Gynecol. 2000 Aug; 183(2): 444–8. https://doi.org/10.1067/mob.2000.105915 PMid:10942484

13. Ahmed FA, Amin A, Naeem NK. HELLP syndrome, A clinical variant of pre-eclampsia. Annals. 2007 Apr-Jun; 13(2).

14. Svendson HK, Abildgaard U. The HELLP syndrome, clinical issues and management, A review. BMC Pregnancy and Child Birth. 2009; 9(8):1471–2393.

15. Banoo S, Makhdoomi TA, Mir S, Malik J. Incidence of HELLP syndrome in sever pregnancy induced hypertension and its impact on maternal and fetal outcome. JK Practitioner. 2007 Apr-Jun; 14(2).

16. Gul A, Cebeci A, Aslan H, Polat I, Ozdemivi A, Ceylan Y. Perinatal outcomes in severe preeclampsia-eclampsia with and without HELLP syndrome. Gynecol Obstet Invest. 2005; 59:113–8. https://doi.org/10.1159/000082648 PMid:15591806.

17. Magann EF, Bass D, Chauhan SP, et al. Antipartum corticosteroids; Disease stabilization in patients with the syndrome of HELLP. Am J Obstet Gynecol. 1994; 171:1148–53. https://doi.org/10.1016/0002-9378(94)90054-X.

18. Visser W, Wallenburg HCS. Temporising management of severe preeclampsia with and without the HELLP syndrome. British Journal of Obstet and Gynecology. 1995 Feb; 102:111–7. https://doi.org/10.1111/j.1471-0528.1995.tb09062.x PMid:7756201.