



“A CROSS SECTIONAL STUDY OF HELLP SYNDROME IN PREGNANCY COMPLICATED BY SEVERE PRE ECLAMPSIA IN A TERTIARY CARE HOSPITAL”

Gynaecology

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ABSTRACT

Background and objectives

Hemolysis, elevated liver enzymes and low platelets (HELLP) syndrome is a dangerous and life threatening complication in severe preeclampsia. It remains as an important cause of maternal and perinatal morbidity and mortality globally. The objective of this study was to find out the incidence of HELLP syndrome in pregnancies complicated by severe pre eclampsia and to assess the maternal and perinatal morbidity and mortality in women with HELLP syndrome secondary to severe pre eclampsia.

Methodology

A one year Cross sectional study was conducted in the labour room of KLE Academy of Higher Education and Research (KAHER), Belagavi for the period of one year from January 2016 to December 2016. Ethical clearance was obtained from the JNMC Institutional Ethics committee. The primary objective was to determine the incidence of severe pre eclampsia and HELLP syndrome in patients of severe pre eclampsia. The secondary objective was to study the associated maternal and perinatal morbidity and mortality.

Results

During the study period, a total of 6236 number of deliveries were conducted in the hospital. Among them, 312 (5%) pregnant women developed severe preeclampsia and 33 women developed HELLP syndrome (10.57%). The mean age was 25.18±3.81 years. Labour was induced in 21.21% of the women. Majority (66.67%) of the women had vaginal delivery, while the rest had caesarean section (33%). The most common indication for LSCS was HELLP 81.82%. Majority (84.85%) of the women had complications of HELLP alone while 9.09% of the women had HELLP syndrome associated with abruption.

The mean birth weight was 2.27±0.69 Kgs. All cases had live births. The requirement of NICU admission was noted in 18.18% and the most common cause of NICU admission was Meconium aspiration syndrome with fetal distress (50%). The perinatal mortality rate was 16.67%.

Conclusion and interpretation

HELLP syndrome is one of the rare complications of severe pre eclampsia. This study shows 5% incidence of severe preeclampsia and incidence of HELLP syndrome in pregnancy complicated by severe preeclampsia as 10.57%. The incidence in our study is high as our hospital is a tertiary care centre that receives referral cases (high risk with poor prognosis) from North Karnataka for further management.

KEYWORDS

HELLP syndrome; Maternal outcome; Perinatal outcome;

Introduction

HELLP syndrome is a dangerous and life threatening complication in women presenting with pregnancy complicated by severe preeclampsia. HELLP is abbreviated form for hemolysis, elevated liver enzymes and low platelets.

HELLP syndrome is a complication of severe pre eclampsia and was first described by Weinstein in 1982.¹ The occurrence of microangiopathic haemolysis, elevated liver enzymes and low platelets (HELLP) is a serious complication of pregnancy associated with statistically significant increase in maternal and perinatal morbidity and mortality. The syndrome is seen in 0.5%-0.9% of pregnancies and 10%-20% of patients with severe preeclampsia.

70% of the cases develop this condition before delivery and the remaining within 48 hrs after delivery. About 12 to 19% of these cases can be normotensive while proteinuria may be evident in 18% of the cases.²

The HELLP syndrome in general complicates 0.2 to 0.6% of all pregnancies and its incidence increases to 4 to 12% in severe pre eclampsia.³ However upto 15% of the patients will have neither hypertension nor proteinuria. Clinical features include jaundice, right upper quadrant pain, nausea, vomiting, headache and blurring of vision. 70% of HELLP syndrome develops in antepartum¹⁹ period (3rd trimester) and the rest in postpartum period within 48 hours of delivery.⁵

The complications of HELLP syndrome include adverse maternal outcomes: abruptio placenta, DIC; acute renal failure, pulmonary edema and intracerebral hemorrhages.¹⁴ The maternal mortality ranges from 1 to 24%. Perinatal complications include Intrauterine growth retardation (IUGR), low birth weight, respiratory distress syndrome

(RDS), sepsis, convulsions. The perinatal mortality which ranges between 18% to 20.3%.³

The present study was aimed to find out the incidence of HELLP syndrome in pregnant women presenting with severe preeclampsia and to determine the associated maternal and perinatal outcome.

Methodology

This cross sectional study was conducted in the labour room of KLE Academy of Higher Education and Research (KAHER), Belagavi for the period of one year from January 2016 to December 2016.

The ethical clearance was obtained from the Institutional Ethical committee, Jawaharlal Nehru Medical College, Belgaum.

Women with Gestational age >24 weeks and features of severe preeclampsia that is presence of Hypertension – systolic > 160 mm Hg or diastolic > 110 mm Hg on two occasions at least 4 hours apart alongwith proteinuria were included in the study. Among them those who developed HELLP syndrome based on Mississippi classification of HELLP syndrome⁶ were further studied. Those with medical disorders like chronic hypertension, renal disease, epilepsy and not willing to participate in the study were excluded from the study. A written and informed consent was obtained prior to the enrolment.

The selected women were interviewed to obtain demographic data, obstetric history and current pregnancy details. These women were subjected to clinical examination. Subsequently, blood investigations including Haemoglobin levels, blood group, platelet count, prothrombin time, activated partial thromboplastin time, peripheral smear, serum fibrinogen, urine albumin, microscopy, lactate dehydrogenase, liver function tests, renal function tests were done.

These women were treated with antihypertensive drugs: ie, nifedipine and labetalol. Magnesium sulphate was administered intramuscular for therapeutic and prophylaxis purposes. Termination of pregnancy based on the BISHOPS score by vaginal delivery or a caesarean section was done for obstetric indications. Mother and the baby were monitored for one week in the postpartum period.

The primary outcome was to determine the incidence of HELLP syndrome in severe pre eclampsia and complications. The secondary outcome was to determine the associated maternal and perinatal outcome.

Statistical analysis

The data was analysed using SPSS statistical software version 20.0. The categorical data was expressed as rates and continuous data was expressed as mean \pm standard deviation (SD). The comparison of continuous data done using independent sample 't' test. A probability value (p value) of ≤ 0.05 was considered as statistically significant.

Results

During the study period, a total of 6236 number of deliveries were conducted. Among them, 312 (5%) pregnant women developed severe preeclampsia. Out of which based on Mississippi classification of HELLP syndrome, 33 (10.57%) of the women developed HELLP syndrome. During the study period the incidence of severe preeclampsia was found to be 5.00% and HELLP syndrome was 10.57% of the women with severe preeclampsia.

Most of the women were age group between 26 to 30 (45.45%). The mean age was 25.18 ± 3.81 years. Most of the women were primi (45.45%) and para 1 (45.45%) while 9.09% of the women were para 2. The most common clinical presentation was headache (36.36%) followed by nausea (15.15%), chest pain (9.09%), Vomiting (6.06%), jaundice (6.06%), right upper quadrant pain (3.03%). Magnesium sulphate administration was done in 33.33% of the women.

In the present study it was observed that, the mean platelet count was significantly low ($p < 0.001$) and mean SGOT ($p < 0.001$), SGPT ($p < 0.001$) and LDH ($p < 0.005$) were significantly high in women who developed HELLP syndrome.

According to MISSISSIPPI classification, 20 women belonged to HELLP 1, 9 women in HELLP 2 and 4 women in HELLP 3 category.

Labour was induced in 21.21% of the women while 24.24% of the women had spontaneous labour. The most common indication for the induction of labour was severe preeclampsia (57.14%) followed by HELLP (28.57%). Majority (66.67%) of the women had vaginal delivery and 33.33% of the women underwent LSCS. The most common indication for LSCS was HELLP (81.82%) followed by fetal distress (18.18%). All the women had live births (100%).

Out of 33 women with HELLP syndrome, majority (84.85%) of the women had complication of HELLP alone while 9.09% of the women had HELLP along with abruption and 3.03% of the women each had HELLP with DIC, HELLP with eclampsia and HELLP with abruption with renal failure respectively.

Neonatal outcome was available in 33 babies. Of them 36.36% of the babies weighed between 2.500 to 2.999 kg. The mean birth weight was 2.27 ± 0.69 Kgs. The requirement of NICU admission was noted in 18.18% and the most common cause of NICU admission was Meconium aspiration syndrome with birth asphyxia (50%). In spite of having all live births, there were 5 early neonatal deaths noted because of extreme prematurity with RDS. So the perinatal mortality rate came up to 16.67%.

Discussion

The triad of hemolysis, elevated liver enzymes and low platelets poses a serious threat to the maternal and fetal outcome. It is reported that, the HELLP syndrome occurs in about 0.5 to 0.9% of all pregnancies and in 10 to 20% of cases with severe preeclampsia.³ In this study 5% of the women developed severe pre eclampsia, that was higher than that in Aabidha et al (5%)⁸

HELLP syndrome was seen in 10.57% of the patients, which does not differ significantly from other authors⁸. However other authors have

reported a higher incidence in their setting.^{1,11} Chawla sushil⁷ reported an incidence of 0.45% in general population and 3.7% of the hypertensive patients.

All the patients developed HELLP syndrome in the antepartum period only. This finding is similar to a parallel study¹³. Whereas Sushil Chawla⁷ reported that 20% cases developed HELLP in the postpartum period.

Based on Mississippi classification⁶ majority of the women had HELLP I (60.61%) followed by HELLP II (27.27%) and HELLP III (12.12%), in contrast to Lakshmi Narayana Kota¹³, who reported 20% cases in class 1, and 40% each in class 2 and 3.

The mean age of the patients was 25.18 years, vs 27.7 years in Turgut et al¹⁰ and 24.25 years with Sushil Chawla⁷. This suggest that the frequency of HELLP syndrome peaked in the age group between 26 to 30 years that is, young women. The young age of the women observed in the present study can be explained by the socio cultural practice of early marriage in Indian population.

In this study 45.45% of the women each belonged to primi para and para 1, slightly higher than that found in a similar study. In this study most of the women presented with headache (36.36%) which was consistent with a parallel study¹⁰.

In this study most of the women (42.42%) delivered between 37 to 40 weeks and 36.36% of the women delivered between 32 to 36 weeks while 15.15% of the women delivered at gestational age 32 weeks. However the mean gestational age was 36.13 ± 3.39 weeks suggestive of mostly term delivery, which was slightly higher than that reported by previous authors¹⁰.

Once the diagnosis of HELLP syndrome is confirmed, the decision is to be made regarding the mode of delivery. The labour was induced in 21.21% of the women and the most common indication was severe preeclampsia (57.14%). more two thirds that is, 66.67% of the women had vaginal delivery and 33.33% of the women underwent LSCS, suggesting higher rate of vaginal delivery. The rate of vaginal delivery observed in the present study was very high compared the study by Turgut A et al.¹⁰ who reported rate of vaginal delivery as only 18.9%. Lakshmi Narayana Kota¹³ reported 86.6% of cases delivered by caesarean section. The most common indication for LSCS was HELLP syndrome itself (81.82%) followed by fetal distress (18.18%).

In this study the most common associated complication along with HELLP syndrome was noted was abruption in 9.09% of the women followed by DIC (3.03%) and abruption with renal failure. (3.03%). These observations are consistent with those of Ashwini et al¹⁴. In contrast to these observations, Turgut A et al.¹⁰ in their study found that acute renal failure was significantly higher in the HELLP syndrome group. Liu et al.¹¹ also found significantly higher acute renal failure in the HELLP group.

It is heartening to know that no maternal mortality occurred in our study as compared to 1.5%⁹ and 0.9%¹⁰ in other studies. This can be explained by the multidisciplinary approach and the excellent care given to the mother admitted in the labour room in our setup. Lakshmi Narayana Kota¹³ reported a maternal mortality of 61.66%. Curriel-Balsera et al.,¹ Ngwenya S. et al.⁹ and Quah et al.¹⁴ reported 1.5%, 1.7% and 1.3% maternal mortality in their settings, respectively

In this study all the patients had live births (100%), consistent with studies from previous authors⁸.

However, the perinatal mortality rate in our study was 16.67% which can be attributed to the 5 early neonatal deaths due to extreme prematurity and RDS. In contrast to this, Lakshmi Narayana Kota¹³ and Sushil Chawla⁷ have reported a 45.8% and 46.2% perinatal mortality rates, which is very high as compared to our study.

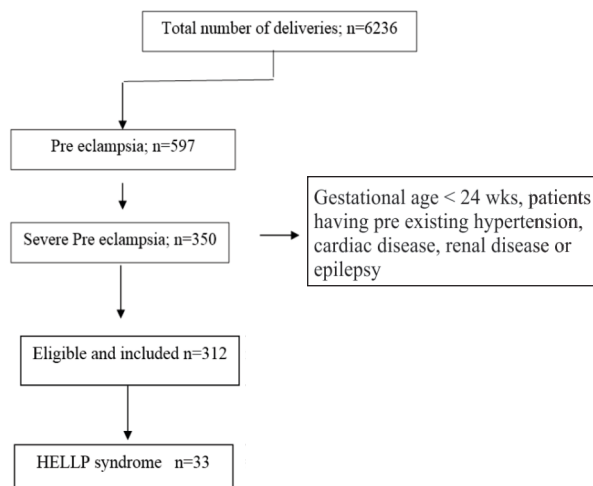
20 (61%) of the babies were preterm. As the mean gestational age was 36.13 weeks, more than one third (36.36%) of the babies weighed between 2.500 to 2.999 kg and the mean birth weight was 2.27 ± 0.69 Kgs suggesting normal birth weight, higher as compared to other studies^{9,10}.

Majority of the neonates had APGAR score of > 7 at 1 minute interval (66.67%) The mean APGAR score at one minute was 6.39±1.06 which was comparable to the study by Turgut A. et al.¹⁰ At 5 minutes interval APGAR score of ≥ 7 was noted in majority of the of the babies (90.91%). The mean APGAR score was 7.91±1.10. In another study¹⁰, the mean APGAR score at 5 minutes was noted as 8.0±1.2 which was consistent with the present study. In this study, the requirement of NICU admission was noted among 18.18% of the babies and the most common cause of NICU admission was meconium aspiration syndrome with birth asphyxia (50%) on the contrary in a study by Turgut A. et al.¹⁰ the rate of NICU admission was 69.5% and most common cause was hyperbilirubinemia.

Conclusion

Overall the present study shows a 10.57% incidence of HELLP syndrome in women with severe preeclampsia. So, the incidence of HELLP syndrome is on the rise and aggressive management is needed to prevent morbidity and mortality. A high degree of suspicion is the mainstay in diagnosis and prompts multi disciplinary teamwork, immediate and prompt delivery, remains the cornerstone in the management of HELLP syndrome. Though the maternal and perinatal mortalities are high, they can be reduced by timely availability of blood products, ICU facilities and NICU care. However these findings need further validation due to potential limitations of the study. The limitations of the study were smaller subset of proportion of women with HELLP Syndrome which limited us to determine the significant risk factors and single centre study design which limits us to generalize the results on entire population. Further large multicentric studies involving higher subset women with HELLP Syndrome focusing risk factors may provide insights into HELLP syndrome.

Management and delivery of HELLP syndrome mothers and infants should be performed at tertiary care centers, where highly trained neonatal and intensive care unit personnel and facilities are available, and a team approach with obstetricians and specialized pediatricians is essential to improve both the maternal and neonatal outcomes.



Clinical and laboratory parameters	HELLP syndrome				p value
	Yes (n=33)		No (n=279)		
	Mean	SD	Mean	SD	
Age (Years)	25.18	3.81	26.30	4.51	0.127
Systolic (mm Hg)	164.18	11.12	161.91	12.53	0.280
Diastolic (mm Hg)	101.94	10.24	106.70	10.82	0.016
Haemoglobin (g/dL)	10.51	2.59	11.30	2.16	0.105
Platelet count (per cu mm)	56266.67	35238.12	217114.00	96710.69	< 0.001
SGOT (IU/L)	239.91	38.33	52.64	113.88	< 0.001
SGPT (IU/L)	175.03	34.09	41.15	83.73	< 0.001
Uric acid (mg/dL)	6.72	1.86	6.21	5.57	0.271
Serum Creatinine (mg/dL)	0.81	0.24	2.29	15.27	0.108
LDH (U/L)	690.94	514.77	427.46	263.65	0.005
Fibrinogen	360.32	98.88	328.18	104.84	0.266
Gestational age (weeks)	36.00	3.43	36.34	3.52	0.744

Distribution of women according to gestational age

Gestational age	Number of cases	HELLP 1	HELLP 2	HELLP 3
<32 weeks	5	4	1	0
32 to 36 weeks 6 days	12	8	2	2
37 to 39 weeks 6 days	14	8	4	2
>40 weeks	2	0	2	0
Total	33			

Mode of delivery

Mode of delivery	Number of cases	HELLP 1	HELLP 2	HELLP 3
Vaginal Delivery	22	13	6	3
Caesarean section	11	7	3	1
Total	33			

Maternal complications

Pulmonary oedema	0
Cardiac complications	0
Eclampsia	3%
Abruption	6%
Renal complications	3%
DIC	3%
Maternal I death	0

Perinatal outcome

	Total	HELLP 1	HELLP 2	HELLP 3
Preterm	20	12	3	2
IUGR	16	7	6	3
Still birth	0	0	0	0
Low APGAR	14	7	5	2
IUD	0	0	0	0
Early neonatal death	5	3	2	0

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