ORIGINAL ARTICLE

HELLP Syndrome among Pregnant Women Delivering at a Tertiary Care Hospital in Kathmandu: A Descriptive Cross-sectional Study

Pooja Paudyal[1], Prezma Shrestha[2], Sunita Bajracharya[3], Ashma Rana[4]

Abstract

Background: Hemolysis, elevated liver enzymes, and low platelet (HELLP) syndrome is a serious obstetric complication with high risk of adverse maternal and perinatal outcomes. The aim of the study was to find the prevalence of HELLP syndrome and to analyze the maternal and perinatal outcomes.

Methods: This was a descriptive cross-sectional study conducted in a tertiary care center from April 13, 2016, to April 12, 2020, after obtaining ethical clearance from the Institutional Review Committee. All the women with HELLP syndrome who delivered in the hospital during the study period were enrolled. A convenience sampling technique was used. Data were analyzed using the Statistical Package for the Social Sciences version 24 software. Descriptive analysis was done and frequency and proportion were calculated for binary data.

Results: Prevalence of HELLP syndrome was 0.23%. The majority of the cases were in the 25–29 years age-group and the mean maternal age was 28.05 years. Twenty-seven (61.36%) were primigravida. Of 44, 27 (61.36%) delivered through lower segment cesarean section. Nineteen (43.18%) women were admitted to the high dependency unit. There were four (9.1%) maternal deaths. Most (68.18%) of the babies were preterm and 62.5% of the live-born babies were admitted to the neonatal intensive care unit. There were 20 perinatal deaths with a perinatal mortality of 45.45%.

Conclusion: Hemolysis, elevated liver enzymes, and low platelet syndrome is a dreadful complication with high morbidity and mortality. Timely termination of pregnancy is warranted to arrest further progress of pathophysiology.

Clinical significance: Outcomes in HELLP syndrome can be improved with early diagnosis and timely intervention.

Keywords: Hemolysis, Elevated liver enzymes, and low platelet syndrome, Maternal and perinatal outcome, Pregnancy.

Journal of South Asian Federation of Obstetrics and Gynaecology (2022): 10.5005/jp-journals-10006-2043

Introduction

Weinstein in 1982 coined the term HELLP syndrome (H-hemolysis; EL-elevated liver enzymes; and LP-low platelets) and described HELLP syndrome as an entity separate from traditional severe preeclampsia.[1] There is multisystem involvement in HELLP syndrome resulting in generalized vasospasm, microvascular endothelial damage, and intravascular platelet aggregation.[1,2]

The presence of this syndrome is associated with an increased risk of maternal death and increased rates of maternal morbidities such as pulmonary edema, acute kidney injury (AKI), disseminated intravascular coagulopathy (DIC), abruptio placentae, liver hemorrhage or failure, adult respiratory distress syndrome (ARDS), sepsis, and stroke.[2–4] The perinatal mortality and morbidities are also substantially increased with the reported perinatal death rates in recent series ranging from 7.4 to 20.4%.[3,5]

Since the occurrence of HELLP syndrome is low, there are not many studies on it in our country. The aim of the study was to find the prevalence of HELLP syndrome and to analyze the maternal and perinatal outcome.[6]

Methodology

This was a descriptive cross-sectional study conducted in the Department of Obstetrics and Gynecology of Tribhuvan University Teaching Hospital (TUTH) over a period of 4 years from April 13, 2016, to April 12, 2020. Ethical clearance was obtained from the Institutional Review Committee (IRC) of the Institute of Medicine. Convenience sampling technique was used and all patients diagnosed with HELLP syndrome during the study period were studied. Data were retrospectively collected from the record book of labor room, ICU, patient files, labor room audits, near miss, and maternal mortality audits of the department. Patients were classified according to the Mississippi classification. For this study, available history, clinical data, and detailed laboratory investigations were studied to find out:

- Patient profile: age, gravidity of patient.
- Maternal outcome (morbidity and mortality): Postpartum hemorrhage (PPH), eclampsia, AKI, DIC, blood and blood

[1]Department of Obstetrics and Gynecology, Tribhuvan University Teaching Hospital, Kathmandu, Bagmati, Nepal

[2–4]Department of Obstetrics and Gynecology, Institute of Medicine, Kathmandu, Bagmati, Nepal

Corresponding Author: Pooja Paudyal, Department of Obstetrics and Gynecology, Tribhuvan University Teaching Hospital, Kathmandu, Bagmati, Nepal, Phone: +9779841526853, e-mail: paudyalpooja@yahoo.com

How to cite this article: Paudyal P, Shrestha P, Bajracharya S, *et al.* HELLP Syndrome among Pregnant Women Delivering at a Tertiary Care Hospital in Kathmandu: A Descriptive Cross-sectional Study. J South Asian Feder Obst Gynae 2022;14(2):132–135.

Source of support: Nil

Conflict of interest: None

product transfusion, high dependency unit (HDU) admission, mortality.
- Perinatal outcome (morbidity and mortality): Intrauterine fetal death (IUFD), stillbirth, early neonatal death (NND), prematurity, low birth weight (LBW), neonatal intensive care unit (NICU) admission.

All data were entered into a master chart and descriptive analyses were conducted using the SPSS 21 software. Qualitative variables were expressed as percentages and quantitative variables as means.

Inclusion Criteria

All pregnant women with preeclampsia with one or more of the following:

- Hemolysis detected by either peripheral smear or elevated Indirect bilirubin (>1.2 mg%) or elevated LDH levels (>600 u/L).
- Elevated liver enzymes (AST >70 u/L).
- Decreased platelet count <150,000/cumm.

Exclusion Criteria

- Known case of hepatic disease.
- Known case of hemolytic anemia.
- Known case of platelet disorders.
- Acute fatty liver of pregnancy.

Definition

Mississippi classification—(University of Mississippi 2006 criteria).[6]

Class I (severe thrombocytopenia): platelets <50,000/mm^3, AST or ALT >70 IU/L, LDH >600 IU/L.

Class II (moderate thrombocytopenia): platelets 50,000–100,000/mm^3, AST or ALT >70 IU/L, LDH >600 IU/L.

Class III (mild thrombocytopenia): platelets 100,000–150,000/mm^3, AST/ALT >40, LDH >600 IU/L.

Results

Over the study period of 48 months, 44 patients were diagnosed with HELLP syndrome. The prevalence of HELLP syndrome was 0.23% (44/19163 deliveries).

The majority of the cases were in the 25–29 years age-group. Mean maternal age was 28.05 years with a range of 16–39 years. Twenty-seven (61.36%) were primigravida and the rest were multigravida with maximum gravidity being five. The mean gestational age at delivery was 33.4 weeks with the minimum gestational age being 26 weeks and the maximum being 40 weeks. Majority of 28 (63.63%) patients were referred while the rest were booked cases (Table 1).

Forty (90.9%) cases were diagnosed antenatally while the rest four (9.09%) were diagnosed in the postpartum period; two out of the four resulted in maternal mortality.

According to the Mississippi classification, 16 (36.4%) patients were class I HELLP and 23 (63.6%) class II. Maternal and perinatal outcomes were worse in class I HELLP with all four (100%) maternal mortality and 12 (60%) perinatal mortality occurring in class I (Table 2).

Of the 44 patients, 27 (61.36%) delivered through lower segment cesarean section (LSCS) and 17 (38.63%) delivered vaginally. Among those vaginal deliveries, 11 were IUFD, one was a stillbirth and only five resulted in live births, while in the LSCS group all 27 were live births. Of the four maternal mortalities, two had a LSCS and two had vaginal delivery. High dependency unit admissions and blood transfusion were more in the LSCS group (Table 3).

Table 1: Demography of women with HELLP syndrome

	n (%)
Age (years)	
<19	5 (11.36)
20–24	5 (11.36)
25–29	17 (38.63)
30–34	13 (29.54)
≥35	4 (9.09)
Gestational age (weeks)	
<28	4 (9.09)
28–32	15 (34.09)
33–36	11 (25)
37–40	14 (31.81)
Gravidity	
Primi	27 (61.36)
Multi	17 (38.6)
Booked/referred	
Referred	28 (63.63)
Booked	16 (36.36)

Table 2: Classification of cases according to Mississippi classification

HELLP	*n (%)*	*Maternal mortality n = 4*	*Perinatal mortality n = 20*
Class I	16 (36.4)	4 (100%)	12 (60%)
Class II	28 (63.6)	0 (0%)	8 (40%)
Class III	0	NA	NA

There were four (9.1%) maternal mortalities in this study. Nineteen (43.18%) cases needed High dependency unit admission and 36 (81.81%) patients needed blood products transfusion mainly platelet-rich plasma (PRP). Life-threatening complications occurred in the form of eclampsia in nine (20.45%) abruption in six (13.36%), PPH in four (9.1%), DIC in six (13.36%), AKI in eight (18.18%), and multiorgan failure in seven (15.9%) (Tables 3 and 4).

The average birth weight in this study was 1781.25 g with birth weight ranging from 700 to 3250 g. There were 32 live births out of 44 cases while 11 were IUFD and 1 stillbirth. Of the 32 live births, 20 needed NICU admission and 12 survived while 8 resulted in early NND. Most were preterm births 30 (68.18%), among them 18 were live births (Table 5). Twelve of the preterm live-born babies developed respiratory distress syndrome (RDS) and seven died. There was one more NND in this study which was a term baby but expired due to meconium aspiration syndrome (MAS). The perinatal mortality rate (PNMR) was 45.45%.

Discussion

The prevalence of HELLP syndrome was 0.23% in this study. According to other studies HELLP syndrome occurs in about 0.5–0.9% of all pregnancies.[2,7,8] The commonest age-group was 25–29 years with the average age being 28.05 years and most patients were primigravida probably because of the predominance of preeclampsia in the first pregnancy. Similar to this finding was

Table 3: Comparison according to the mode of delivery *n* (%)

				Perinatal outcome			
Delivery mode	*Maternal mortality*	*HDU admission*	*Blood transfusion*	*IUFD*	*Stillbirth*	*Live-birth*	*NND*
Vaginal 17 (38.63)	2 (4.54)	7 (15.9)	12 (27.27)	11 (25)	1 (2.27)	5 (11.36)	2 (4.54)
LSCS 27 (61.36)	2 (4.54)	12 (27.27)	24 (54.5)	0	0	27 (61.36)	6 (13.63)
Total 44	4 (9.1)	19 (43.18)	36 (81.81)	11 (25)	1 (2.27)	32 (72.72)	8 (18.18)

Table 4: Maternal complications *n* (%)

Eclampsia	9 (20.45)
Abruptio	6 (13.36)
PPH	4 (9.1)
DIC	6 (13.36)
AKI	8 (18.18)
Multiorgan failure	7 (15.9)
Maternal mortality	4 (9.1)

Table 5: Perinatal outcome *n* (%)

Live birth—32 (72,72)	**Stillbirth**—1 (2.27)	**IUFD**—11 (25) 0
NICU admission—20 (62.5)		
Low APGAR—8 (25)		
NND—8 (25)		
Term—14 (31.8)		
Preterm—30 (68.18)		

seen in the study by Murray et al. wherein mean age was 29 years and 70% were primigravida.[9] However in the study by Lakshmi et al. commonest age-group was 21–25 years probably reflecting trends of earlier marriages in India.[10]

The mean gestational age at delivery was 34.4 weeks, similar to the study by Yıldırım et al. where it was 34 weeks.[11] In this study, 40 (90.9%) cases were diagnosed antenatally while the rest four were diagnosed in the postpartum period; similar to the finding in the study by Kapan et al. in which two-thirds cases were diagnosed antenatally.[12] The four cases who were diagnosed in the postpartum period were all referred cases and had a worse outcome with two out of four resulting in maternal mortality as they had been referred late in a moribund state.

According to the Mississippi classification, 16 (36.4%) patients were class I HELLP and 23 (63.6%) were class II. Maternal and perinatal outcomes were worse in class I HELLP with all four (100%) maternal mortality and 12 (60%) perinatal mortality occurring in class I. Contrary to this 20% cases were in class I and 40% cases were class II and 40% class III HELLP syndrome in a study by Lakshmi et al.[10]

Mode of delivery was vaginal in 17 (38.63%) and 27 (61.36%) delivered by LSCS. In a study by Sujatha et al., 42% delivered by LSCS.[13] Lower segment cesarean section was the preferred mode of delivery as the development of help warrants immediate termination. Vaginal delivery was conducted for IUFD cases and those in advanced labor.

Patients developed complications like AKI, DIC, abruption, and the majority needed high dependency unit admissions and blood transfusion similar to study by Sitaula et al.[8]

Maternal mortality was 9.1%, similar to Sujatha et al. where it was 11.6% and in Lakshmi et al. it was 6.66%.[10,13]

In our study, perinatal mortality was 45.45%. In literature perinatal mortality is reported between 6.6 and 60%.[2,3,5] As 68.18% were preterm, high perinatal mortality was more a consequence of prematurity rather than the severity of HELLP syndrome. In cases with timely intervention, before IUFD occurred, live birth resulted in 32 cases. Of the 32 live-born, only eight died as a result of good neonatal care. Of those who had NND, only one was a term, the rest were all preterm who died due to complications of prematurity. The smallest baby to survive was a 28 weeks 950 g baby.

Conclusion

The maternal and perinatal outcome of HELLP syndrome depends on the severity, timely intervention, and availability of ICU, dialysis, ventilatory support, and blood and blood products transfusion along with NICU with advanced neonatal care. Even though the only effective treatment of HELLP syndrome is delivery; with the involvement of a multidisciplinary team, including obstetricians, critical care team, and the neonatologist, maternal and fetal outcomes can be improved.

Limitations

The small sample size and retrospective nature of this study are its limitations.

Clinical Significance

Maternal and fetal outcomes in HELLP syndrome can be improved with early diagnosis and timely intervention.

Orcid

Pooja Paudyal https://orcid.org/0000-0002-7522-0759
Prezma Shrestha https://orcid.org/0000-0001-7962-872X
Sunita Bajracharya https://orcid.org/0000-0001-8467-3277
Ashma Rana https://orcid.org/0000-0003-3117-7207

References

1. Weinstein L. Syndrome of hemolysis, elevated liver enzymes, and low platelet count: a severe consequence of hypertension in pregnancy. Am J Obstet Gynecol 1982;142(2):159–167. DOI: 10.1016/s0002-9378(16)32330-4.
2. Sibai BM, Ramadan MK, Usta I, et al. Maternal morbidity and mortality in 442 pregnancies with hemolysis, elevated liver enzymes, and low platelets (HELLP syndrome). Am J Obstet Gynecol 1993;169(4):1000–1006. DOI: 10.1016/0002-9378(93)90043-i.
3. Audibert F, Friedman SA, Frangieh AY, et al. Clinical utility of strict diagnostic criteria for the HELLP (hemolysis, elevated liver enzymes,

and low platelets) syndrome. Am J Obstet Gynecol 1996;175(2): 460–464. DOI: 10.1016/s0002-9378(96)70162-x.
4. Martin JN Jr, Rinehart BK, May WL, et al. The spectrum of severe preeclampsia: comparative analysis by HELLP (hemolysis, elevated liver enzyme levels, and low platelet count) syndrome classification. Am J Obstet Gynecol 1999;180(6 Pt 1):1373–1384. DOI: 10.1016/s0002-9378(99)70022-0.
5. Visser W, Wallenburg HC. Temporising management of severe pre-eclampsia with and without the HELLP syndrome. Br J Obstet Gynaecol 1995;102(2):111–117. DOI: 10.1111/j.1471-0528.1995.tb09062.x.
6. Martin JN Jr, Rose CH, Briery CM. Understanding and managing HELLP syndrome: the integral role of aggressive glucocorticoids for mother and child. Am J Obstet Gynecol 2006;195(4):914–934. DOI: 10.1016/j.ajog.2005.08.044.
7. Geary M. The HELLP syndrome. Br J Obstet Gynaecol 1997;104(8): 887–891. DOI: 10.1111/j.1471-0528.1997.tb14346.x.
8. Sitaula S, Manandhar T, Thapa BD, et al. Prevalence of hemolysis, elevated liver enzymes, low platelet count syndrome in pregnant women in a tertiary care hospital. JNMA J Nepal Med Assoc 2020;58(226):405–408. DOI: 10.31729/jnma.4921.
9. Murray D, O'Riordan M, Geary M, et al. The HELLP syndrome: maternal and perinatal outcome. Ir Med J 2001;94(1):16–18. PMID: 11322219.
10. Lakshmi NK, Kavitha G, Prabha Devi K, et al. Study on HELLP syndrome–maternal and perinatal outcome. Int J Reprod Contracept Obstet Gynecol 2017;6:714–719. DOI: 10.18203/2320-1770.ijrcog20170411.
11. Yıldırım G, Güngördük K, Aslan H, et al. Comparison of perinatal and maternal outcomes of severe preeclampsia, eclampsia, and HELLP syndrome. J Turk Ger Gynecol Assoc 2011;12(2):90–96. DOI: 10.5152/jtgga.2011.22.
12. Kapan M, Evsen MS, Gumus M, et al. Subcapsular liver hematoma in HELLP syndrome: case report. Gastroenterology Res 2010;3(3): 144–146. DOI: 10.4021/gr2010.04.178e.
13. Sujatha M, Meena M. A comparative study of maternal and perinatal outcome in patients with and without HELLP syndrome. Int J Reprod Contracept Obstet Gynecol 2017;6(1):49–53. DOI: 10.18203/2320-1770.ijrcog20164420.