

DOI: <http://dx.doi.org/10.18203/2320-1770.ijrcog20162986>

Research Article

Feto-maternal outcome in patients with HELLP and partial HELLP syndrome: a prospective 10 year study in Shri Guru Ram Rai Institute of Medical and Health Sciences, Uttarakhand, India

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Received: 08 July 2016

Accepted: 05 August 2016

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ABSTRACT

Background: The acronym HELLP was coined by Loise Weinstein in 1982 to describe a syndrome consisting of hemolysis (H) elevated liver enzyme (EL) and low platelets (LP). The purpose of the study was to detect and evaluate the fetal maternal outcome of HELLP and partial HELLP syndrome among preeclamptic patients.

Methods: Study analyzed fetal and maternal outcome in 110 patients with HELLP syndrome and 89 patients with partial HELLP Syndrome and compared with 1100 patients of preeclampsia only.

Results: 1210 patients were included in this study. Out of these patients HELLP syndrome, partial HELLP syndrome and preeclampsia were 10% and 7.3% and 82.7%. The systolic BP, gestational age at admission and at delivery, hematological and biochemical parameters, vaginal delivery and type of anesthesia were significantly different in HELLP syndrome and partial HELLP syndrome than in preeclampsia group. There was significant difference in perinatal outcome like birth weight, IUGR, neonatal death and NICU-admissions. Eclampsia was significantly increased in HELLP syndrome and partial HELLP syndrome.

Conclusions: HELLP and partial HELLP syndrome must be diagnosed as soon as possible. Partial HELLP and HELLP syndrome are equally dangerous. HELLP Syndrome is severe than preeclampsia in terms of maternal and perinatal outcome.

Keywords: HELLP syndrome, Partial HELLP syndrome, Preeclampsia

INTRODUCTION

The acronym HELLP was coined by Loise Weinstein in 1982 to describe a syndrome consisting of hemolysis (H), elevated liver enzyme (EL) and low platelets (LP). Some experts consider it as a severe form of preeclampsia, while others believe that HELLP syndrome and preeclampsia are separate disorders with overlapping features. As many as 15-20% of the patients with HELLP syndrome do not have antecedent hypertension or proteinuria.⁶

Complete HELLP syndrome

- Hemolysis-characteristic peripheral blood smear, decreased Hb and hematocrit, total bilirubin >1.2mg/dl
- Elevated liver enzymes-serum lactate dehydrogenase (LDH) > 600 IU/L aspartate aminotransferase (AST) >70 IU/L, alanine aminotransferase (ALT) >50 IU/L.
- Low platelet count platelets <150,000.

Presenting symptoms of HELLP syndrome include epigastric or right upper quadrant abdominal pain (65%),

nausea and vomiting 50%, malaise 90% and non-specific viral syndrome like symptoms.

Table 1: Sign and symptoms of HELLP syndrome.

Sign and symptoms	Percentage
Malaise	90%
Right upper quadrant/epigastric tenderness	90%
Proteinuria	87%
Hypertension	85%
Right upper quadrant/epigastric pain	65%
Headache	60%
Nausea vomiting	36%
Visual changes	17%
Bleeding	09%
Asitis	08%
Jaundice	05%
Shoulder or neck pain	05%
Pulmonary edema	6%

Partial HELLP syndrome

Pregnant women with preeclampsia do not always present the full picture of HELLP syndrome but there are changes in hematological indices and or liver function which adversely affect fetomaternal outcome. Sub-types of HELLP syndrome.

Depending upon laboratory abnormalities

1. Mississippi classification

A. Class 1 (most severe)

- Platelets <50,000
- AST or ALT > 70 IU/L
- LDH > 600 IU/L

B. Class 2

- Platelets 50,000- 1,00,000
- AST or ALT >70 IU/L
- LDH > 600 IU/L

C. Class 3 (least severe)

- Platelets 1,00,000-1,50,000
- AST or ALT > 40 IU/L
- LDH > 600 IU/L

2. Tennessee classification

A. True or complete

- Platelets <1,00,000
- AST > 70 IU/L
- LDH > 600 IU/L

B. Partial or incomplete Severe pre-eclampsia with any one of the following: ELLP, HEL, EL, LP

ELLP: Absence of hemolysis; HEL. Absence of low platelets; EL: Elevated liver enzymes LP: low platelets.¹

Any pregnant patient with epigastric or right upper quadrant abdominal pain in the second half of pregnancy, particularly if in association with nausea and or vomiting has HELLP Syndrome until proven otherwise.²

The category of women with at least two features of complete HELLP syndrome, are separately detected

The purpose of this study is to compare maternal and perinatal outcome among women with HELLP syndrome, partial HELLP syndrome and women with preeclampsia.

METHODS

The Study was conducted over a period of 10 years in the department of obstetrics and gynecology, Shri Guru Ram Rai Institute of Medical and Health sciences Dehradun, Uttarakhand which is a tertiary level hospital and medical college. After obtaining ethical approval 1210 patients were included in this study who comprised of antenatal patients attending outpatient department, admitted from emergency, admitted in antenatal ward as booked patients or referred from outside. Inclusion criteria include Blood pressure 140/90 or more and proteinuria of 300 mg/24 hours or more after 20 weeks of pregnancy for preeclampsia group. For HELLP syndrome group above mentioned abnormal laboratory parameters along with criteria for preeclampsia. For partial HELLP syndrome at least two above mentioned abnormal parameters of HELLP with criteria for preeclampsia

Exclusion criteria included known heart disease leading to hypertension, essential hypertension, renal disease, and previous history of jaundice or liver disease, coarctation of aorta, pheochromocytoma and systemic lupus erythromatosus. The Patients were subjected to detailed history, clinical examinations and investigations. Patients were categorized into 3 groups:

- Patients with preeclampsia having the features of HELLP syndrome
- Patients with preeclampsia having only partial HELLP syndrome
- Patients with preeclampsia without the features of complete HELLP syndrome or partial HELLP syndrome.

Following parameters were assessed: maternal age, parity, gestational age at the time of admission, gestational age at delivery, systolic blood pressure, diastolic blood pressure, laboratory parameters like Hb%, packed cell volume, bilirubin levels, peripheral blood smear, platelet count, LDH level, AST levels ALT levels,

maternal complications, mode of delivery, type of anesthesia, placental changes. The following perinatal factors were analyzed: birth weight, Apgar score at 1 min of birth, NICU admission and neonatal complications.

RESULTS

Total 1210 patients were included in study. Out of 1210 cases 1100 were pre eclampsia and 110 cases were HELLP Syndrome. Out of 110 cases complete HELLP syndrome were found in 21 cases and remaining 89 patients presented partial HELLP syndrome Table 2 and 3 one showing distribution of HELLP syndrome, Partial

HELLP syndrome and preeclampsia, according to maternal age, parity, SBP, DBP, gestational age on admission and delivery, number of booked cases and laboratory parameters. No significant difference in age and parity were found among the HELLP syndrome partial HELLP syndrome and preeclampsia group. Majority of patients in all three groups did not present with severe hypertension. Both the systolic and diastolic blood pressure was higher in HELLP syndrome group than preeclampsia group. Gestational age on admission and delivery in patients with HELLP and partial HELLP syndrome were found to be significantly less than in patients with pre eclampsia.

Table 2: Distribution of patients according to various parameters.

Various parameters	Preeclampsia (n = 1100)	HELLP syndrome (n = 110)	P value (between PE and HS)	Partial HELLP syndrome (n = 89)	P value (between PE and PHS)
Age (in years)	23.6±4.19	23.6±4.2	0.91	24.2±4.75	0.61
Parity					
Primi	667 (66.55%)	70 (63.64%)	0.422	59 (66.55%)	0.816
Multi	433 (33.45%)	40 (36.36%)		30 (33.45%)	
SBP(in mm of Hg)	168.2±14.12	178.6±15.12	0.02	178.3±15.18	0.14
DBP(in mm of Hg)	104.6±5.07	107.3±7.26	0.02	106.6±7.07	0.14
GA on admission	36 weeks 3 days ±2 weeks 2 days	35 week±2 weeks	0.01	35 week± 3 weeks	.04
GA at delivery	36 weeks 4 days ±2 weeks	35 weeks±3 weeks	0.00	35 week±3 weeks 2 days	0.003
Booked cases	823 (74.82%)	70 (63.64%)	0.001	38(42.69%)	0.016

Table 3: Laboratory parameters of the various groups.

Laboratory parameters	Preeclampsia (n = 1100)	HELLP syndrome (n = 110)	P value (between PE and HS)	Partial HELLP syndrome (n = 89)	P value (between PE and PHS)
Hb (gm%)	10.4±1.21	9.1±1.21	0.00007	9.3±1.31	0.005
PCV (%)	32.4±2.6	23.8±4.22	0.000	25.2±3.08	0.005
Platelet count (cmm)	263449±80021.31	160590±55000	0.000	185534±78218.14	0.002
LDH (u/I)	892±349.3	1016.4±383.7	0.000	986.1±236.3	0.000
Total bilirubin (mg/dl)	0.8±.45	2.6±1.51	0.000	2.3±1.53	0.000
AST (u/I)	58.3±10.03	148.2±73.00	0.000	144.8±70.3	0.000
ALT (u/I)	41±6.43	148.3±70.80	0.000	143.5±66.67	0.000

Table 4: Distribution of preeclampsia, HELLP syndrome (complete and partial) and partial HELLP syndrome, according to H, HLP, HEL, ELLP.

Distribution of preeclampsia					
Haemolysis in peripheral blood smear	126 (11.51%)	75 (68.18%)	0.001	50 (56.25%)	0.001
Haemolysis and low platelet count				2 (2.247%)	
Haemolysis and elevated liver enzymes				30 (33.70%)	
Low platelet count and elevated liver enzymes				7 (7.86%)	

Booked cases in both HELLP syndrome (63.64%) and partial HELLP syndrome (42.69%) were found to be significantly less than in patients with preeclampsia (74.82%)

The laboratory parameters in HELLP and partial HELLP syndrome were found to be significantly different than preeclampsia group.

Table 5: Mode of delivery in various groups.

Mode of delivery	Preeclampsia (n = 1100)	HELLP syndrome (n = 110)	P value (between PE and HS)	Partial HELLP syndrome (n = 89)	P value (between PE and PHS)
CS	824 (74.82%)	80 (72.72%)	0.422	61 (68.63%)	0.559
Emergency	708 (64.36%)	80 (72.72%)	0.137	61 (68.63%)	0.367
Elective	116 (10.55%)	0		0	
VD	276 (25.09 %)	30 (27.26%)	0.028	28 (31.46%)	
Spontaneous	95 (8.63%)	0	0.029	0	0.007
Induced	181 (16.19%)	30 (27.27%)		28 (31.46%)	

Table 6: Type of anaesthesia.

Type of anaesthesia	Preeclampsia (n=1100)	HELLP syndrome (n = 110)	P value (between PE and HS)	Partial HELLP syndrome (n = 89)	P value (between PE and PHS)
Spinal anaesthesia	760 (69.09%)	45 (56.25%)	<0.001	39 (63.93%)	0.011
General anaesthesia	63 (5.73%)	35 (43.75%)		22 (24.71%)	

Table 7: Characteristics of preeclampsia, HELLP syndrome and partial HELLP syndrome according to macroscopic features of placenta.

Macroscopic picture	Preeclampsia (n = 1100)	HELLP (n = 110)	Partial HELLP (n = 89)	P value between PE and H	
Abruption	22 (2%)	52 (47.27%)		11 (12.4%)	
Calcification	117 (10.63%)	52 (47.27%)	0.562	11 (12.5%)	0.363
Infarction	18 (1.63%)	4 (9.09%)		2 (6.25%)	

Table 8: Perinatal outcome.

Perinatal outcome					
BW (in gm)	2474.5±425.32	1813±628.86	0.000	2020±666.63	0.0047
Apgar score (at 1 mn)	5.3±2.72	5±2.59	0.139	5.2±2.52	0.28
IUD	24 (2.18%)	20 (18.18%)	0.003	18 (20.22%)	0.009
IUGR	208 (18.9%)	26 (23.63%)	0.412	22 (25%)	0.337
Neonatal Death	13 (1.17%)	34 (37.4%)	0.001	11 (12.57%)	0.038
Admission in NICU	297 (27%)	75 (68.18)	0.001	55 (62.1%)	0.011

In patients with partial HELLP syndrome 2.25% had hemolysis and low platelet counts while 56.25% had hemolysis and 33.70% had hemolysis and elevated liver enzymes 7.86% had low platelet counts (Table 4).

In Table 5 and 6 shows characteristics of HELLP syndrome, partial HELLP syndrome and preeclampsia according to mode of delivery, type of anaesthesia, naked eye features of placenta, perinatal and maternal outcome. Majority of patients in all three groups underwent caesarian section. Emergency caesarian sections were more than elective caesarian section in all three groups.

There were no statistically significant differences among the three groups.

Spontaneous vaginal delivery rate were less than induced patients in all categories. Patient with HELLP syndrome and partial HELLP syndrome mostly underwent general anaesthesia during caesarian section but spinal anaesthesia was predominant in preeclampsia group. Rate of spinal anaesthesia were significantly less in HELLP syndrome (40.00%).

Table 9: Maternal complications.

Maternal complications					
Eclampsia	79 (7.18%)	40 (44.30)	0.001	28 (31.46%)	0.008
MOD	39 (3.54%)	9 (8.18%)		6 (6.74%)	
ARF	43 (3.90%)	20 (18.18%)		11 (12.35%)	
Placental abruption	23 (2.09%)	14 (12.72%)		11 (12.35%)	
DIC	23 (2.10%)	10 (9.09%)		5 (5.61%)	
Sepsis	35 (3.18%)	10 (9.09%)		5 (5.617%)	
Death	10 (0.90%)	20 (18.18%)		5 (5.617%)	

Table 10: Onset of complications.

Onset of complications			
Antepartum	120 (11.09%)	30 (27.27%)	22 (24.70%)
Postpartum	47 (4.2%)	26 (23.66%)	28 (31.20%)

DISCUSSION

HELLP Syndrome was diagnosed in 1982 but controversies present regarding the diagnosis and prognosis of this disease. This study used laboratory criteria for diagnosis of the disease. Partial HELLP Syndrome may be missed or underestimated by the treating doctor.

According to the study prevalence of the complete HELLP syndrome is 1.73%, partial HELLP Syndrome with preeclampsia is 7.3% and preeclampsia is 91.6. Abbade JF et al found the complete HELLP 1.8%, Partial HELLP 12.9%, preeclampsia 47.1%.³ Results are comparable to the study.

According to study by Guzel AI et al HELLP syndrome was 0.6%.⁴ The results are not comparable to the study. The reason may be the most of the patients in the study were primigravida and less than 24 years old. Similar results were reported by Rashid A et al.⁵

Mean diastolic BP for partial HELLP syndrome was 104.6±5.01, 107.3±7.26 respectively. Even though HELLP Syndrome considered being a variant of severe Eclampsia its severity is reflected in its laboratory parameters. But not in the usual clinical parameter of Blood Pressure that typical reflects disease severity of preeclampsia. This is similar to the findings of Hemant S et al and Heram K et al.^{6,9}

Caesarian Section rate in HELLP was very high in the study as pregnancy was terminated as soon as disease was diagnosed to avoid worsening of condition. This resulted in increased in cesarean section rate and preterm delivery. In our study cesarean section rate in preeclampsia, HELLP and partial HELLP is respectively 74.82%, 72.72%, 68.63% with a p value of 0.669, thereby ruling out any significant difference among the value.

The results are comparable with Rakshit A et al and Rath W et al.^{5,7}

Women with partial HELLP syndrome have significant maternal and perinatal complications which are almost as dangerous as in HELLP syndrome. It emphasizes the importance of recognizing HELLP and partial HELLP syndrome as distinct entity which are associated with serious maternal and perinatal complications.

Present study showing significantly increased incidence of eclampsia in HELLP syndrome group and partial HELLP syndrome than that in preeclampsia. Similar results are documented by Rakshit et al and Aydin S et al.^{5,8} Placental findings seen with bad perinatal prognosis in both HELLP and partial HELLP syndrome. Usually mother with altered liver functions received fresh frozen plasma and mother with low platelets (<50000/cu mm) received platelet transfusion. Sepsis was mainly observed in referral patients with poor antenatal care. Maternal deaths were due to disease itself or its complication. A significant number of patients with HELLP and partial HELLP were referred from outside. This underlies the importance of awareness of diagnosis of both HELLP and partial HELLP syndrome and timely referral to tertiary care hospital for early and proper treatment.

CONCLUSION

HELLP and partial HELLP syndrome must be diagnosed as early as possible in pregnant or post-partum patient with preeclampsia. Present study suggests that all pregnant or post-partum women with hypertension should be investigated for complete blood counts, platelet count and liver enzyme along with all routine tests. This will help treating obstetrician to make an early diagnosis of partial HELLP or HELLP syndrome to allow early intervention for better fetomaternal outcome.

HELLP syndrome is severe than preeclampsia in term of maternal and perinatal outcome.

Partial HELLP syndrome is almost as grave as HELLP syndrome. Continued research work is required to calculate exact prevalence in Uttarakhand state, India.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Tandon A, Chaudhari P, Gupta V, Ramola M. Feto-maternal outcome in patients with HELLP and partial HELLP syndrome: a prospective 10 year study in Shri Guru Ram Rai Institute of Medical and Health Sciences, Uttarakhand, India. *Int J Reprod Contracept Obstet Gynecol* 2016;5:3066-71.