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Original Research Article

HELLP syndrome on the rise: a major cause of maternal deaths

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ABSTRACT

Background: In the recent years, 2021 to 2022, there has been a sudden rise in the number of HELLP syndrome cases admitted to Modern Government Maternity Hospital, (MGMH) / Osmania Medical College. There were maternal deaths due to complications secondary to HELLP syndrome. Complications like placental abruption, DIC, PPH, PRAKI, pulmonary edema, were responsible for maternal deaths. The need for blood products has increased enormously. In our earlier study of eclampsia and imminent eclampsia from the same Institute, during 2004 to 2007, we did not find HELLP syndrome to be a major cause of maternal deaths. Hence, we proceeded with in depth study of the complications, morbidity and mortality and some management issues related to HELLP syndrome. All 70 cases of HELLP in this study had associated Preeclampsia/eclampsia.
Methods: This is a prospective analytical observational study of 70 cases of HELLP syndrome.
Results: Recurrent preeclampsia was noted in 6÷45=13.33%. Cases of hypothyroidism were observed in 6÷45=13.33%. There were four sets of twins, 8.88%. Placental abruption was noted in 10/70 women with HELLP, 14.28%, DIC occurred in 15÷70=21.42%, PPH occurred in 11÷45 cases, 24.44%, PRAKI was recorded in 16/70 patients, 22.85%, Pulmonary edema occurred in 5/70, 7.14%, PPCM in cases with HELLP syndrome were 2÷70=2.85%, Abdominal delivery was needed in 53÷70=75.71%, Maternal mortality in the present study was10÷70=14.28%, The perinatal mortality was 21.33%. Blood products were needed in 22/45 cases, (9.136) units on the average.
Conclusions: Dissemination of knowledge that immediate delivery should be planned in all cases of HELLP, irrespective of gestational age is the need of the hour. Postponing delivery would lead to complications.

Keywords: HELLP syndrome, HDP, Maternal mortality, PRAKI, Blood products, Immediate delivery

INTRODUCTION

HELLP syndrome is characterized by the three signs of haemolysis, elevated liver enzymes and thrombocytopenia. Haemolysis, one of the major characteristics of the disorder, is due to a microangiopathic haemolytic anaemia (MAHA). Red cell fragmentation is caused by high-velocity passage through damaged endothelium. Secondary to intimal damage, endothelial dysfunction and fibrin deposition, leads to platelet aggregation and disseminated intravascular coagulation. Destruction of red blood cells by haemolysis causes increased serum lactate dehydrogenase (LDH) levels and decreased haemoglobin concentrations.[1,2]

Haemolysis contributes substantially to the elevated levels of LDH, whereas elevated aspartate aminotransferase (AST) and alanine aminotransferase (ALAT) levels are mostly due to liver injury.

Preeclampsia is a hypertensive disorder seen in pregnancy that can cause end-organ damage and is the single greatest risk factor for HELLP and is present in more than 80% of all HELLP syndrome cases.[3,4]

Incidence of HELLP increases to 4-12% in severe preeclampsia. Majority of patients experience malaise, fatigue, and nonspecific complaints for a few days. Excessive weight gain and generalized edema may precede the syndrome. The complaint of epigastric or right upper quadrant pain is present only in half to two-thirds of patients.[5,6]

Two major classifications are used for the diagnosis of HELLP syndrome, based on haemolysis, elevated liver enzymes, and low platelet (PLT) count, namely, the Tennessee classification of complete and partial, in partial HELLP syndrome, evidence of severe preeclampsia–eclampsia in association with two of three laboratory criteria for HELLP syndrome.

According to the Mississippi triple-class system, the severity of HELLP syndrome is mostly characterised by the amount of platelet count.

HELLP syndrome: Mississippi triple-class system

class 1, platelet count <50,000, AST or ALT >70 IU/L, Total LDH >600 IU/L,

class 2, 50,000 >PLT (L) 100,000, AST or ALT 70 IU/L, Total LDH 600 IU/L,

class 3, 100,000 >PLT (L) 150,000, AST or ALT 40 IU/L, Total LDH 600 IU/L

A recent report in literature of treatment of HELLP syndrome with eculizumab, 7 (On the fourth postpartum day, platelets continued decreasing, and treatment with eculizumab was started (900 mg IV). The patient received all together four weekly doses of eculizumab (900 mg) and she started to recover rapidly.[7] It is possible that eculizumab, if initiated earlier, at the first signs of HELLP syndrome, might have been beneficial during the later course of the disease, potentially mitigating kidney injury, and thus preventing need for hemodialysis and later CKD.[7]

Objectives of the study

In the recent years, 2021 to 2022, there has been a sudden rise in the number of HELLP syndrome cases admitted to Modern Government Maternity Hospital, (MGMH)/Osmania Medical College. There were maternal deaths due to complications secondary to HELLP syndrome. Complications like placental abruption, DIC, PPH, PRAKI, pulmonary edema, were responsible for maternal deaths. The need for blood products has increased enormously. In our earlier study of eclampsia and imminent eclampsia from the same Institute, during 2004 to 2007, we did not find HELLP syndrome to be a major cause of maternal deaths. Hence, we proceeded with in depth study of the complications, morbidity and mortality and some management issues related to HELLP syndrome. All 70 cases of HELLP in this study had associated Preeclampsia/eclampsia.

METHODS

Study design

A prospective observational analytical study of 70 cases of HELLP syndrome.

Study place

In this paper we are including 45 cases of HELLP syndrome from MGMH/ Osmania Medical College, a government hospital, during a period of nine months, from August2021 to the end of April 2022. A prospective study of 25 cases of HELLP syndrome, duration of study was 28 months, from May 2011 to Aug 2013, managed at CARE Institute of Medical Sciences (CIMS), Hyderabad. A total of 70 cases of HELLP syndrome.

Study subjects

Pregnant women with preeclampsia and eclampsia with the laboratory evidence of HELLP syndrome, complete and partial, after 20 weeks of gestation till term and past term pregnancy are included in the study. All have delivered, except for one who died undelivered.

Objectives of the study

A total 70 cases of HELLP managed at two tertiary hospitals in Hyderabad are presented. The complications, morbidity and mortality are discussed.

The management of HELLP syndrome cases was as per the protocol followed in the Institute. Blood bank facilities were there in both the hospitals. Specialists, nephrologists, pulmonologists, physicians, neurologists were available for consultation. Specialist consultation was available from Osmania General Hospital, for MGMH.

Counselling of the patients attendants was done in every case regarding the severity of illness and complications that may occur.

Pregnant woman age, parity, period of gestation, severity of preeclampsia, eclampsia, class of HELLP syndrome, mode of delivery, need for blood products, number of units transfused, maternal complications like pulmonary edema, PRAKI, abruption placenta, disseminated intravascular coagulation, postpartum haemorrhage, PPCM, PRES,

vision impairment, mode of delivery, maternal mortality, perinatal mortality (PNM), birth weight were analysed. Associated clinical conditions like hypothyroidism, twin gestation, recurrence of preeclampsia have been recorded. The period of gestation when maternal deaths occurred have been analysed. Certain deficiencies in management have been pointed, some suggestions are included.

Ethical approval

The study was approved by the Institutional Ethics Committee.

RESULTS

MGMH data

Obstetric data and age of 45 cases

Primigravidae 18, constituted 40.0% of the total 45 cases of HELLP syndrome while multies 27, were 60.0 % of the total. Second gravida were 16, 35.55%, third were 8, 17.77% and fourth gravida were 3, 6.66% (Table 1).

Table 1: HELLP syndrome obstetric data and age of 45 cases.

Gravida status	N= 45	%	Mean age in years
Multies	27	60.0	
Primi	18	40.0	23.4
2nd Gravida G2P1L1 -15 G2P1LO -1	16	35.55	23.71
3rd Gravida G3P2L2 -5 G3A2 -1 G3P2L1 -2	8	17.77	25.66
4th Gravida And + G4P3L3 - 1 G4P3L2 - 1 G5P2L2A2 -1	3	6.66	28

The average age of the women was ranging from 23.4 years for primies, 23.71 years for second pregnancy, 25.66 years for third and 28 years for 4th gravidae. All were between 23 to 28 years.

HELLP syndrome: associated clinical conditions and risk factors

HELLP associated with eclampsia, were 17-37.77%, Severe hypertension with HELLP were 21, 46.66%.

Recurrent preeclampsia was noted in 6÷45=13.33%. Cases of hypothyroidism were observed in 6÷45=13.33%. There were four sets of twins, 8.88% (Table 2).

HELLP syndrome. associated complications in 45 cases

Placental abruption was diagnosed in 8÷45 cases, 17.77%. PPH was managed in 11-24.44%, DIC occurred in 9-20.0%. PRAKI was managed in 5, 11.11%.

Table 2: HELLP syndrome- associated clinical conditions and risk factors.

Clinical conditions	Total 45, No.	%
Eclampsia,	17	37.77
Imminent eclampsia	3	
Antepartum Ecl.	11	
Postpartum Ecl.	3	
Severe hypertension	21	46.66
Recurrent preeclampsia	6	13.33
Hypothyroid-5 Hyperthyroid-1	6	13.33
Twin gestation DCDA twins - 2 MCDA – 2	4	8.88
Diabetes	4	8.88

Table 3: HELLP syndrome- associated complications in 45 cases in MGMH.

Complication	No. of cases-45	%
Placental abruption	8	17.77
PPH	11	24.44
DIC	9	20.0
PRAKI	5	11.11
Severe anaemia	18	40.0
Blood products	22	48.88
Ascites	6	13.33
Pleural effusion	3	6.66
Scar dehiscence in previous LSCS	3	6.66
Pulmonary oedema	3	6.66
Vision impairment, Retinopathy	2	4.44
Status eclampticus	1	2.22
PRES	1	
PPCM	1	2.22
Pancreatitis	1	2.22
Aspiration pneumonitis	1	2.22
Septic shock	1	2.22
Intra peritoneal bleeding	1	2.22
Abdominal wall haematoma	-	-

Severe anaemia in 18 women, 40.0%, in some secondary to APH and PPH, and in some, pregnancy with anaemia needed active management. Blood products, sometimes massive transfusion was needed in 22-48.88%.

Ascites was observed in 6 cases, 13.33%. Pulmonary oedema in 3-6.66%, scar dehiscence in previous LSCS, 3-6.66%, Pleural effusion in 3-6.66% of cases were noted. Vision impairment, retinopathy complications in two, 4.44%. Status eclampticus, PPCM, aspiration pneumonitis, pancreatitis occurred in one case each, 2.22% (Table 3).

Table 4: HELLP syndrome – 45 cases- mode of delivery and birth weight, delivered= 44, twins- four sets (one died undelivered).

Mode of delivery	Number -44	%	Details (one died undelivered)
Labour induced	19	43.18	
Vaginal	13	29.54	
LSCS	31	70.45	
Birth weight	Total- 47	%	Twins- 4 sets
<1 kg early onset	7	14.89	400 gms, I kg-IUD, I kg dead, still birth-1kg, IUD- 550gms, Dead- 250 g, 1.0 kg-NND
1.1-1.5	7	14.89	1.5, 1.2, 1.2, 1.5, 1.5, 1.5, 1.5.
1.6-2.0	13	27.66	2.0, 2.0, 2.0, 1.7, 2.0, 1.6, 1.8, 1.7, 1.9, 2.0, 1.8, 2.0, 1.8.
2.1-2.5	10	21.27	2.5,2.1,2.3,2.5,2.2, 2.3,2.5-IUD, 2.5, 2.3, 2.3
2.6-3.0	8	17.02	3.0, 2.6, 2.8, 2.9, 3.0, 2.9, 2.9 3.0.
3.1-3.5	3	6.38	3.4, 3.5, 3.3.

Mode of delivery

Labour was induced in 19 - 43.18% women with HELLP syndrome. Caesarean delivery was necessary in 31-70.45%, Failed induction in some, previous caesarean delivery, twin gestation, a term live foetus in a case with abruption, the need for immediate delivery were some indications for abdominal delivery. Vaginal delivery was possible in 13-29.54% of women. One woman with HELLP syndrome died undelivered. There were 4 sets of twin gestation in 45 women (Table 4).

Birth weight

There were a total of 47 neonates and aborted foetuses with 4 sets of twins. In the <1 kg, early onset preeclampsia, HELLP group, 7-14.89%, women had pregnancy wastage. (IUD, still birth, dead, aborted). Weight in the range of 1.1-1.5 kg, there were 7-14.89%, 1.6-2.0 kg, 13 - 27.66%, 2.1-2.5 kg, 10-21.27%, 2.6-3.0 kg, 8-17.02%, 3.1-3.5 kg, 3-6.38% neonates were there. There was one IUD with 2.5 kg, due to placental abruption.

Early onset HELLP, <1 kg, accounted for 14.89%, Full term were 6.38%. The remaining 38-80.85%, were between 28 to 38 weeks of gestation (Table 4).

HELLP syndrome – 45 cases: gestational age in weeks, maternal deaths and PNM

Between 22 to <28 gestation in weeks, there were 5-11.11% There was one maternal death at this gestational age. At 28-30 weeks, there was only one case – 2.22%, one maternal death, Primi, 30 weeks, statsus eclampticus. Between 31-34 weeks gestation, there were 13 cases, -28.88%, and three maternal deaths occurred in this group, 1. G2PILI1previous CS, 34 weeks. 2. Primi, 34 weeks. And 3. G2P1L1 32 weeks. Between 35-37 weeks, 12 women, -26.66%, no maternal death in this group. In the 38-40 weeks group, 10-22.22%, delivered with one maternal death, G3P2L2, 38 weeks 3 days. There were 4-8.88%, in the 40+ weeks gestation. The maternal mortality was 6÷45=13.33%.

Maternal mortality

In four deaths, the sequence of events, in HELLP and DIC, abdominal delivery, followed by atonic PPH, blood products transfused, haemorrhagic shock and in two cases, pulmonary edema leading to death. In one case cerebral infarcts in a case of status eclampticus and HELLP syndrome. One case died due to pulmonary edema, while transfusion of two units of PRBC for severe anaemia, she died undelivered (Table 5).

The PNM was 11/48=22.91% (Table 5).

Fetal growth restriction and PNM

Fetal growth restriction, FGR (IUGR), was diagnosed in 13/44 cases, 29.54%. Low APGAR scores were observed in 4/34 cases, 11.76%. Perinatal Mortality was 22.91% (Table 6).

The patients with HELLP syndrome admitted to CARE institute of Medical Sciences (n=25) are more elderly, 6 women, 28.6% are between 30- 40+ age group. Three of these have conceived after IVF procedures. More number of patients with complications like PRAKI, PPCM, PRES, Intra peritoneal bleeding were admitted to CARE hospital, a multi-speciality hospital, in the private sector. Since in this paper we are including 45 cases of HELLP syndrome from MGMH/ Osmania Medical College, a government hospital with total free medical service to the public and from a tertiary private sector hospital, this paper would project a more representative data of HELLP syndrome.

Table 5: HELLP syndrome – 45 cases- gestational age in weeks, maternal deaths and PNM.

Gestation in weeks	No. of cases N = 45	Maternal death, gestation- weeks.	Cause of death	Perinatal outcome
22 to <28	5 – 11.11%	1.Primi 22 weeks 6 days	HELLP, abruption, IUD, Hysterotomy, Atonic PPH Blood- 7 units, Haemorrhagic shock and Pulm edema.	IUD-4
28-30	1 - 2.22%	2. Primi 30wks Status eclampticus, LSCS done.	2. Status eclampticus left hemiparesis. HELLP, Large cerebral infarcts, obstructive hydrocephalus, emergency MPVP shunt done, Aspiration pneumonitis	
31-34	13 - 28.88%	3. G2PILI1 previous CS. 34 weeks. 4. Primi, 34 wks 5. G2P1L1 32 weeks	3. MCDA Twins, LSCS done, PPH atonic, Relaparotomy, 11 units bl.products, Haemorrhagic shock, Died 6 hrs after LSCS. 4, 34 wks, HELLP, severe IUGR, LSCS done, Atonic pph, 17 units of Blood products, PRAKI , DIALYSIS - 2 times, Sepsis. 5.Complete HELLP, severe anaemia, Pulm edema after 2 PRBC transfusion, died undelivered.	IUD, One, - I kg Still birth-1kg, One 1.0 kg- NND, one
35-37	12 – 26.66%	--		One NND Day -1
38-40	10 – 22.22%	6. G3P2l2, 38 weeks 3d	6. HELLP, Abruption with IUD, LSCS, Atonic PPH, Medical mx, % units bl.products given, Haemorrhagic shock and Pulmonary edema.	
40+	4 – 8.88%			
Total no. 45	45	6/45 = 13.33%		11/48 = 22.91%

Results from CARE hospital

Material

This was a prospective study, duration of study was 28 months, from May 2011 to August 2013, managed at CARE Institute of Medical Sciences, Hyderabad.

Table 6: HELLP syndrome – fetal growth restriction and perinatal mortality.

Perinatal outcome	Total=45	%
FGR (IUGR)	14/45	29.54
Low APGAR Delayed cry- 2 Deeply asphyxiated- 1 Asphyxia- 1	4/34	11.76
Perinatal outcome IUD – 7 SB – 1 NND – 2+1	11/48	22.91
Perinatal mortality	11/48	22.91
Maternal mortality	6/45	11.36

Twenty-five cases of HELLP syndrome with severe pre-eclampsia and/or eclampsia managed at CARE hospital are presented in this paper. HELLP lab data (Table 7). HELLP syndrome, 25 cases managed at CARE hospital, 2011-2013.Values of PLATELET COUNT, LDH U/L, SGOT U/L, SGPT U/L, in 25 cases. The mean and standard deviation are calculated for 25 cases. This also indicates the severity of HELLP syndrome in 25 cases.

Obstetric status

Primies were 9 -36%, multies were 16=64%, no living child – 5, Multies with a living child – 11.

Age wise distribution of cases

Age <20 years, 3 - 14.3%, 21-25 years, 8 cases, 28.6%, 26-29 years, 8-28.6%, 30-39, three cases, 14.3% and above 40 years, three –14.3%.

Three patients were 40 to 43 years old, out of which two were IVF conceptions, total IVF 4/25. Severe Pre-

eclampsia was noted at an early gestational age in the elderly age group (Table 8). HELLP Syndrome, N=25, CARE Institute of Medical Sciences. Age wise distribution of cases.

Table 7: HELLP syndrome, 25 cases managed at CARE hospital, 2011-2013.

Name	Platelet count thousand/ cumm	LDH U/L	SGOT U/L	SGPT U/L
Mean	86220.00	1558.12	240.36	487.48
STD	50914.57	2063.65	405.27	1638.74

Values of platelet count, LDH U/L, SGOT U/L, SGPT U/L, in 25 cases. The mean and standard deviation are calculated for 25 cases.

Severity of HELLP syndrome

As per the Tennessee classification, complete HELLP were 19-76%. partial HELLP were 6-24%, HEL-4, EL-1, LP-1. As per the Mississipi classification, class1 were 6, 24 %, class2 were 14, 56%, class 3 were 5, 20%.

Mode of delivery in 25 cases

Patients were referred after caesarean delivery in 13 cases, 13- 52%, LSCS was done at CARE institute of Medical Sciences in 9-36%, Hysterotomy was done in one – 4% and vaginal delivery in one – 4%, 1 had induced abortion.

Peri-natal outcome

Live births –20, still birth-1, IUD – 1, NND - 1 abortions-2, (26 weeks gestation).

Complications in 25 cases

Eclampsia–8, abruption–2, pulmonary edema–2, AKI-11, PRES–3, PPCM–1, cardiac arrest on admission in ER –2, DIC–6, Eisenmenger syndrome with HELLP -1, septic shock with AKI -1.

Table 8: HELLP syndrome, N=25, CARE Institute of Medical Sciences. Age wise distribution of cases.

Variables	No. of cases	N=25%
Age in years		
<20	3	14.3
21-25	8	28.6
26-29	8	28.6
30-39	3	14.3
>40	3	14.3
Primies /Multies		
Primies	9	36
Multies, no living child	5	
Multies with a living child	11	
Multies	16	64

Maternal deaths

Were four in 25 cases. The causes were HELLP with DIC in two, septic shock with AKI in one, HELLP in a patient with Eisenmenger syndrome – one.

Table 9: HELLP syndrome, complications in 70 cases, comparative studies.

Complication	CARE No. 25	MGMH No. 45	Total No. 70	%	Kaur[8] Jan 2016 August 2017 No 71	2011-2018 Group III 396[10]	Group IV 127[10]	Osmanagaoglu[11] No. 37 1992-2004.	Bahadur[14] 24 months No-40
Eclampsia with HELLP (Remaining – HELLP with PE.)	No. 8	17	25	35.71				cerebral hemorrhage (40%)	
Need for blood transfusion		22		48.88		84.3%,	42.5%		
Number of transferred units		9.136				3.4±1.1,	3.5±0.8		
Multiple complications						19.9%,	26%		
Placental abruption	2	8	10	14.28	16.90	30.3%,	19.7%	11 %	1-2.5%
PPH	-	11		24.44	11.26				3-7.5%

Continued.

Complication	CARE No. 25	MGMH No. 45	Total No. 70	%	Kaur[8] Jan 2016 August 2017 No 71	2011-2018 Group III 396[10]	Group IV 127[10]	Osmanagaoglu[11] No. 37 1992-2004.	Bahadur[14] 24 months No-40
DIC	6	9	15	21.42	5.63			5 %	9-22.9%
PRAKI	11	5	16	22.85	11.26			11 %	30%
Pulmonary edema	2	3	5	7.14	9.85	19.9%,	34.6%		2=5%
Bilateral pleural effusion	1	3	4	5.71				3 %	
Ascitis		6		13.33				11 %	
Vision impairment, Retinopathy	1	2	3	4.28					8-20%
PRES	3	1	4	5.71				cerebral edema (8%)	1-2.5%
PPCM	1	1	2	2.85					
Septic shock	1	1	2	2.85					2-5%
Intra peritoneal bleeding	3	1	4	5.71					
Abdominal wall haematoma	2								
PNM-5/27 Twins 2 sets	5/27 = 18.51%	11/48 = 22.91%	16/75	21.33	43.7 %				42.5%
Maternal Mortality	4	6	10	14.28	19.71%	6.1%,	5.5%	11 maternal deaths (30%).	Nil

DISCUSSION

In the present study of 70 cases, primigravidae 18, constituted 40.0% of the total 45 cases of HELLP syndrome, (MGMH) while multies 27, were 60.0 % of the total. Obstetric status from CARE, 25 cases, primies were 9 -36%, multies were 16 = 64%, In 70 cases, primies constituted 38.57%. This is in contrast to that reported by Kaur et al where majority of the patients were primigravid, 63.64% in complete HELLP and 66.55% in partial HELLP syndrome.[8]

In the present study from MGMH data, between 22 to <28 gestation in weeks, there were 5-11.11%, with a peak frequency between 28th and 37th gestational weeks of 57.77%; between 38-40 weeks group, 10-22.22%, there were 4-8.88 %, in the 40+ weeks gestation.

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.[9]

Placental abruption was noted in 10/70 women with HELLP, 14.28 %, in this series, compared to 16.90%, 30.3%, 19.7%, 11%, in some less, similar to this study in some and more in some.[8,10,11]

Abruption is a known complication of HDP. Abruption with associated preeclampsia- the number of cases with hypertension complicating pregnancy in a series of cases of abruption were 102-57%, severe preeclampsia in 32/180-17.77%. Normal blood pressure was recorded in 62-34.44% at admission.[12] This is similar to our previous study 68/116, (58.62%) cases of abruption were associated with preeclampsia.[13]

DIC occurred in 15÷70=21.42 % in this study. A similar figure has been reported 22.9% in.[14] A DIC rate of 5.63%, 5%, less than our series, was reported in the literature.[8,11]

PPH occurred in11/45 cases, 24.44% in this study, more when compared to 11.26% and 7.5% in.[8,14]

PRAKI was recorded in 16/70 patients, 22.85 % in this series of cases, compared to other studies, 11.26%, 11% and 30%.[8,11,14]

Pulmonary edema occurred in 5/70, 7.14% in this study. A similar percentage reported by, 5%.[14] Pulmonary edema, a

greater occurrence of 9.85%, 19.9%, 34.6% have been reported by others (Table 9).[8,10]

PPCM in cases with HELLP syndrome were 2÷70=2.85%. In four of the six cases of PPCM, 4÷6=66.66%, preeclamsia was associated including one case of HELLP syndrome, from Care hospital, association with HELLP syndrome has been reported.[15]

Mode of delivery in 70 cases- abdominal delivery was needed in 53÷70=75.71% in this series. Almost similar figures were reported, vaginal delivery in 27.27% and LSCS in 72.72% among complete HELLP patients.[16]

Maternal mortality in the present study was 10/70=14.28%. Where as a maternal mortality of 19.71%, reported is close to this study.[8] A maternal mortality of 6.1%, 5.5% has been reported, which is less than our rate.[10] A mortality rate higher than this study, 30%, has been reported in the literature.[11]

The perinatal mortality in this study was 21.33%. This is less compared to 43.7%, and 42.5% reported in other studies (Table 9). HELLP Syndrome, Complications in 70 cases, comparative studies.[8,14]

PRAKI seems to be a major complication of HELLP syndrome. PPH could be secondary to DIC had to be tackled in 24.44% of women with mortality in some.

Blood products were needed in 22/45 cases, (9.136) units on the average. This is more compared to 3.4±1.1, 3.5±0.8.[10] The need for blood transfusion was 48.88% in the study, compared to 84.3%, 42.5%.[10]

In cases of eclampsia, cerebral haemorrhage and CNS events were responsible for maternal deaths. But in cases of HELLP syndrome, the occurrence of DIC, abruption and PPH, made it a more devastating condition with a great need for multiple units of blood products transfusion. The causes of maternal deaths in 10/70 cases – Maternal deaths in CARE were four in 25 cases. The causes were HELLP with DIC in two, septic shock with PRAKI in one, HELLP in a patient with Eisenmenger syndrome – one. Maternal mortality in 45 cases, MGMH- in four deaths, the sequence of events, in HELLP and DIC, abdominal delivery, followed by atonic PPH, blood products transfused, haemorrhagic shock and in two cases, pulmonary edema leading to death. In one case cerebral infarcts in a case of status eclampticus and HELLP syndrome. One case died due to pulmonary edema, while transfusion of two units of PRBC for severe anaemia, she died undelivered.

The HELLP syndrome cases managed at the Institute of Obstetrics and Gynaecology, MGMH/OMC, have increased phenomenally in the study. Whether referrals have increased or the Covid pandemic had any effect needs to be thought of. One explanation put forward is that during the monthly collectors meeting with the medical officers regarding maternal deaths review, intense verbal autopsy of each maternal death has resulted in a greater referral to tertiary hospitals, as the doctors at different hospitals did not wish to take risk of managing HELLP syndrome cases with life threatening complications.

While progress has occurred in the management of eclampsia over the last two decades, better antihypertensives, anticonvulsant Magnesium sulphate, prostaglandins for labour induction, better anaesthesia for caesarean delivery, HELLP syndrome is now contributing to a greater mortality.

During a period of 34 months, from 2003-2007 at Government maternity hospital, Osmania medical college, Hyderabad, 666 women with Eclampsia and imminent eclampsia were managed. Maternal mortality was 17/666 (2.55%). Cerebrovascular events were responsible in 13/17- 76.46%, pulmonary embolism in two, aspiration pneumonia in one and sepsis in one.[17] HELLP syndrome did not figure as a cause of maternal mortality.[17]

A prospective, observational study was conducted among all the obstetric patients admitted to the ICU between October 2011 and December 2012 during a period of 15 months at CARE Institute of Medical Sciences. HELLP syndrome and eclampsia (n=4, 57%) were the major causes of maternal deaths. Leading cause of maternal mortality was HELLP syndrome with DIC. Hypertensive disorders of pregnancy was the commonest cause of admission to ICU. HELLP syndrome cases admitted to ICU were 9/52, 17.30%.[18]

During the years 2019-2020, among the 77 cases of HDP, that were managed in the institute, in the Institute of Obstetrics and Gynaecology, Modern Government Maternity Hospital (MGMH)/Osmania Medical College, Hyderabad, HELLP syndrome were N=7 (7÷77=9.09%).[19]

All 70 cases of HELLP in this study had associated preeclampsia/eclampsia. The complications of HELLP syndrome in various studies have been mentioned in the review article.[20]

The importance of planning immediate delivery in HELLP syndrome should be the mainstay of treatment.

The average admittance-to-delivery time was 9.5 h (95% CI, 6.2 to 12.8, SEM=1.67) for the HELLP syndrome patients who were admitted directly to the hospital, and 21.9 h (95% CI, 9.2 to 34.6, SEM=6.5) for the transferred patients.[21]

It is advised to arrange the delivery within 24–48 h after the diagnosis is made.[22,23]

Suggestions for improvement

Less than 28 weeks, early onset PE, an early decision must be made to terminate the pregnancy.

In some cases blood pressure was not recorded at the antenatal check up, the patients were admitted in a severely compromised state. Every woman, pregnant or otherwise should have a BP recording, when she presents with any ailment, which is a basic mandated requirement in medical practice. In some cases the RMP and ASHA workers are the first persons to be contacted. These RMP Doctors and ASHA workers should be provided with BP apparatus and made to record BP, and institute medicines, to control BP, like oral Nifidepine, or labetalol.

We need to educate the doctors, nurses, ANMs, RMPs, ASHA workers, regarding the need to monitor BP at every antenatal checkup, and referral to higher centres, unless this is done, some women would be victims of HDP and consequences.

Majority of PE and HELLP are occurring from 30 to 40 weeks of pregnancy. The diagnosis of HELLP should mandate immediate delivery. Delay in delivery in HELLP syndrome would lead to severe DIC, abruption, IUD, PPH more difficult to control due to DIC. Delay in delivery would lead to other complications like PRAKI, pulmonary edema and a greater requirement of blood products.

To prevent HELLP, cases with less severe PE should be delivered at 37 weeks of gestation, the severe cases by 34 weeks, which would have prevented HELLP syndrome in 30% of the cases as observed from the data.

These three messages need to be communicated to all those attending women during pregnancy.

Limitations of the study

One of the limitations has been admission of 45 cases of HELLP syndrome within a nine month period, in MGMH. One reason could be greater referrals due to more intense scrutiny of maternal death review. Or Covid pandemic has some impact, we could not collect any data.

CONCLUSION

Dissemination of knowledge that immediate delivery should be planned in all cases of HELLP, irrespective of gestational age is the need of the hour. Postponing delivery would lead to complications.

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