Original Research Paper

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FETO-MATERNAL OUTCOME IN HELLP SYNDROME

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ABSTRACT **Background:** HELLP Syndrome is a serious obstetric complication in pregnancy characterised by haemolysis, elevated liver enzymes and low platelet count. Incidence is 0.5-0.9% of all pregnancies and in 10-20% of cases with severe preeclampsia (PE) and eclampsia. Aim of the present study is to evaluate the incidence, demographic and clinical profile; and maternal and perinatal outcome in women with HELLP syndrome. **Methods:** All women with hypertension with 28 weeks of gestation admitted to labour room in a single unit of tertiary care hospital at Government medical College Kota, Rajasthan from January 2019 to June 2020 and fulfilled the inclusion criteria. **Results:** Incidence of HELLP syndrome was 1.9% of total deliveries and 15.3% of total HDP cases. Out of 50 cases of HELLP syndrome, 62% belonged to class III, 22% to class II and 16% to class I of Mississippi classification. Mean age of patients of HELLP syndrome in present study was 24.72 4.18 years. 32 (64%) were primigravida while 18 (36%) were gravida two or more. Mean gestational age in study group was 35.98+ -3.33 week. Maternal mortality was seen in 6 (12%) cases and most common cause attributed to MODS 4 (66.67%). **Conclusions:** HELLP Syndrome is a severe variant and a dreadful complication of PE and eclampsia, it needs early diagnosis which is based upon clinical and laboratory findings and timely intervention in the form of termination of pregnancy to arrest further progress of pathophysiology leading to complications.

KEYWORDS : HELLP syndrome, Preeclampsia, feto-maternal outcome.

INTRODUCTION

Pregnancy that culminates in a healthy mother and healthy baby is the aim of every obstetrician. But poor resources and lack of regular and appropriate antenatal care results in aggravation of HDP with resultant adverse outcome for both mother and neonate.

CLASSIFICATION OF HDP[1]:

The American College of Obstetricians and Gynaecologists (2013) describes four types of hypertensive disease:

1. Gestational hypertension—definitive evidence for the PE syndrome does not develop and hypertension resolves by 12 weeks postpartum.
2. PE and eclampsia syndrome.
3. Chronic hypertension of any etiology.
4. PE superimposed on chronic hypertension.

Diagnosis of Hypertensive Disorders[1]

Hypertension is diagnosed when blood pressure exceeds 140 mm Hg systolic or 90 mm Hg diastolic at least two readings 6 hours apart. Korotkoff phase V is used to define diastolic pressure[2].

Table 1:DIAGNOSTIC CRITERIA FOR PREGNANCY-ASSOCIATED HYPERTENSION[1]

Condition	Criteria required
Gestational hypertension	BP > 140/90 after 20 weeks in previously normotensive women
PE = hypertension and 1.Proteinuria ¶ Or	>= 300 mg/24 hour, urine protein:creatinine ratio >= 0.3, or Dipstick 1+ persistent (recommended if only sole available test)
2.Thrombocytopenia	Platelet count <1,00,000/
3.Renal insufficiency	Creatinine >Creatinine level >1.1 mg/dL or doubling of baseline (with no prior renal disease)
4.Liver involvement	Serum transaminase levels(AST or ALT) twice normal
5.Cerebral symptoms	Headache, visual disturbances, convulsions
6.Pulmonary oedema	-

PE occurs in 5-10% of pregnancies. The HELLP syndrome is a variant of severe PE that is associated with significant maternal and perinatal morbidity and mortality. It develops in 6-12% of women with PE or eclampsia accounting for 0.4-0.7% of all pregnancies.[2]

The pathophysiology is vasospasm and endothelial dysfunction, fibrin deposition resulting in varied degree of hepatic ischemic damage, microangiopathic hemolytic anaemia and thrombocytopenia. It develops in about 70% cases before delivery, peaking between 27th-37th gestational weeks[3]. It develops within the first 48 hours after delivery. The onset of HELLP Syndrome is rapid, variable and sometimes atypical, so the diagnosis is generally delayed for 5-7 days. Many of them are misdiagnosed with disorders, like cholecystitis, oesophagitis, gastritis, hepatitis, viral fever or idiopathic thrombocytopenia. Typical clinical symptoms are right upper quadrant pain abdomen or epigastric pain, nausea and vomiting. Depending upon laboratory abnormalities[4]:

Mississippi classification

A. Class 1

- Platelets <50,000
- Serum aspartate aminotransferase (AST) or Serum alanine aminotransferase (ALT) > 70 IU/L
- Serum lactate dehydrogenase (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

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

MATERIAL AND METHODS

The study was conducted from January 2019 to June 2020 in the Department of Obstetrics and Gynaecology at Government medical college, Kota in all women with hypertension with 28 weeks of gestation admitted to labour room in a single unit, after obtaining ethical approval and informed consent. They were followed up prospectively till delivery and during the duration of hospital stay. Based on careful history taking, complete general and local examination and necessary investigations (PBS, CBC, FBS, LFT, RFT, PT INR and Serum LDH, urinalysis, USG) their management was individualized according to gestational age, results of

investigations and Bishop's score.

Inclusion criteria:

Blood pressure 140/90 mm of Hg, 28 weeks gestation with P-eclampsia with one or more of the following suggestive of HELLP syndrome-

- Hemolysis detected by either Peripheral blood smear or elevated Indirect bilirubin or elevated LDH levels.
- Elevated liver enzymes.
  1. LDH > 600 IU/L
  2. AST > 70 IU/L
  3. ALT > 70 IU/L
- Decreased Platelet count < 1,50,000/cumm.

Exclusion criteria:

Known cases of

1. Hepatic disease
2. Hemolytic anemias
3. Platelet disorders
4. Chronic hypertension
5. Chronic Renal Diseases
6. Multiple gestations
7. Placenta previa
8. Acute Fatty liver of Pregnancy

RESULTS

Study included 2750 patients. HDP found in 325 (12.6%) cases of which total 2570 patients were screened. There were 325(12.6%) cases of HDP which 115(4.4%) were mild PE, 88(3.4%) were severe PE and 72(2.8%) developed eclampsia. Incidence of HELLP syndrome was 1.9% per total deliveries and 15.3% per total HDP. As per Mississippi classification, out of 50 cases of HELLP studied majority of the cases 31 (62%) belonged to class III, 11 (22%) cases were class II and 8 cases (16%) were class I.

Table2: DEMOGRAPHIC DETAILS

Age (years)	**n = 50**
20-24	27 (54%)
25-29	14 (14%)
30-34	7 (14%)
Gravida	
G1	32 (64%)
G2	12 (24%)
>=G3	6 (12%)
Residence	
Urban	29 (58%)
Rural	21 (42%)
Booked/ unbooked status	
Booked	8 (16%)
Unbooked	42 (84%)
Distribution according to gestational age	
28-31	5 (10%)
32-36	21 (42%)
>=37	24 (48%)

Table3: CLINICAL DETAILS

DISTRIBUTION ACCORDING TO SYMPTOMS				
	Class I	**Class II**	**Class III**	**n = 50**
Nausea/vomiting	4 (50%)	5 (45.5%)	14 (45.2%)	23 (46%)
Headache	5 (62.5%)	4 (36.4%)	10 (32.3%)	19 (38%)
RUQ pain	2 (25%)	0	2 (6.5%)	4 (8%)
BOV (blurring of vision)	2 (25%)	4 (36.4%)	7 (22.6%)	13 (26%)
Vomiting + RUQ pain	1 (12.5%)	0	2 (6.5%)	3 (6%)
Headache + BOV	2 (25%)	2 (18.2%)	5 (16.1%)	9 (18%)
All symptoms	1 (12.5%)	0	1 (3.2%)	2 (4%)
Any one of these symptoms	6 (75%)	9 (81.8%)	15 (48.4%)	30 (60%)
DISTRIBUTION ACCORDING TO CLINICAL SIGNS				
Mild hypertension	6 (75%)	8 (72.7%)	21(67.7%)	35 (70%)
Severe hypertension	2 (25%)	3 (27.3%)	10 (32.3%)	15 (30%)
Edema (+)	6 (75%)	11 (100%)	29 (93.5%)	46 (92%)
Oliguria /hematuria (+)	2 (25%)	6 (54.5%)	6 (19.4%)	14 (28%)
Anemia	5 (62.5%)	6 (54.5%)	14 (45.2%)	25 (50%)
Jaundice	5 (62.5%)	5 (45.5%)	5 (16.1%)	15 (30%)
URINE ALBUMIN				
Nil	0	0	4 (12.9%)	4 (8%)
1+	3 (37.5%)	4 (36.4%)	16 (51.6%)	23 (46%)
2+	3 (37.5%)	5 (45.5%)	10 (32.3%)	18 (36%)
3+	2 (25%)	2 (18.2%)	1 (3.2%)	5 (10%)
DISTRIBUTION OF CASES ACCORDING TO FUNDOSCOPIC CHANGES				
Normal	3 (37.5%)	4 (36.4%)	23 (74.2%)	30 (60%)
Any grade changes	5 (62.5%)	7 (63.6%)	8 (25.8%)	20 (40%)
DISTRIBUTION ACCORDING TO MODE OF DELIVERY				
Caesarean section	4(50%)	7(63.7%)	23(74.2%)	34(68%)
Vaginal delivery	4(50%)	4(36.4%)	8(25.8%)	16(32%)

TABLE 3- MATERNAL AND PERINATAL OUTCOME

DISTRIBUTION OF CASES ACCORDING TO MATERNAL COMPLICATIONS		
Hematological complications		
	Anemia	25(50%)
	D.I.C	6 (12%)
Respiratory complications		
	Pulmonary embolism	1 (2%)
	Pulmonary edema	1 (2%)
Renal complications		
	Oliguria and/or Hematuria	14 (28%)
	A.R.F.	1 (2%)
Obstetric complications		
	APH	8 (16%)
	PPH	3 (6%)
	CPD/Obstructed labor	4 (12.9%)
	Malposition/ Malpresentation	7(14%)
	APE	13(26%)
	PPE	2(4%)
	PRES	1 (2%)
	MODS	4 (8%)
DISTRIBUTION OF CASES ACCORDING TO PERINATAL OUTCOME		
	Preterm	52%
	IUGR	34%
	MAS	14%
	IUD	8%
	NICU admission	50%
	Neonatal deaths	12%

Most common indications for cesarean section (Cs) was fetal distress 10 (20%), malposition 7 (14%), IUGR 6 (12%), APH 6 (12%) and previous cs with worsening parameters 5 (10%). Total deaths in present study were 6(12%). Majority of maternal deaths 4(66.7%) occurred in class II patients wherein MODS accounted for 4 (8%), pulmonary embolism 1 (2%), pulmonary edema with DIC 1 (2%) deaths.

DISCUSSION

In our study incidence of HELLP syndrome was 1.9% per total deliveries and 15.3% per total HDP. The incidence is quoted by different studies viz. 0.19% in total deliveries and 23% in patients with HDP by **Shelat P.M.et al (2020)**[5] 38% in patients with HDP by **Kaur A.P. et al (2018)**[6] **Rakshit A. et al (2014)**[7] reported 12.6% incidence and **Tandon A. et al (2016)**[4] reported 17.3% incidence in hypertensive patients

Majority of the women in present study were primipara 32(64%) which is comparable to **Kaur A.P. et al (2018)**[6] 47 (66.2%), **Tandon A. et al (2016)**[4] 129 (64.8), **Rakshit A. et al (2014)**[7] 46 (60.5%),**Kamble R.C. and Gupte N.S.(2018)**[2] 33 (58.9%) and **Shelat P.M.et al (2020)**[5] 21 (52.5%) respectively all of whom reported higher number of primiparas in their studies as compared to multiparas.

In present study maximum number of patients of HELLP were unbooked 42(84%) similar to study by **Shelat P.M.et al (2020)**[5] 25(62.5%).

However, **Tandon A. et al (2016)**[4] 108(54.3%) and **Rakshit A. et al (2014)**[7] 44(57.9%) have reported higher incidence of HELLP syndrome in their booked cases. Despite ANC booking women are not regular or persistent for visits as required leading to development of complications like HELLP.Mean gestational age in present study was

35.98±3.33 weeks and that reported by **Kaur A.P. et al (2018)**[6] was 36.33±3.62 weeks; **Shelat P.M.et al (2020)**[5] >36 weeks in 16(40%); **Tandon A. et al (2016)**[4] and **Rakshit A. et al (2014)**[7] both reported mean gestational age 35±3 weeks respectively.

In the present study, most common symptom was headache 19(38%), nausea or vomiting 23(46%), RUQ pain 4(8%) and visual disturbances in 13(26%) which are comparable to other studies.[4,6,7]

Cs is decided for obstetric and medical indications like previous cs, bad obstetric history (BOH), malpresentation, APH, CPD, etc. which may vary in different sets of populations and need larger studies for their evaluation. Cs rate was 68% which is comparable to **Tandon A. et al (2016)**[4](70.9%); **Rakshit A. et al (2014)**[7] (71.1%) whereas **Shelat P.M.et al (2020)**[5] (32.5%); **Kaur A.P. et al (2018)**[6] (45.1%);**Kamble R.C. and Gupte N.S.(2018)**[2] (16.1%) lower cs than ours.

In present study, incidence of prematurity was 26(52%); **Shelat P.M.et al (2020)**[5]10 (25%); **Kamble R.C. and Gupte N.S.(2018)**[2] 26 (46.4%) and **Kaur A.P. et al (2018)**[6] 19 (26.8%).

In present study, incidence of IUGR was seen in 17(34%) which is comparable to **Kaur A.P. et al (2018)**[6] 25 (35.2%): **Kamble R.C. and Gupte N.S.(2018)**[2]17 (30.4%); **Rakshit A. et al (2014)**[7] 20 (26.3%);**Tandon A. et al (2016)**[4] 48 (26.1%) and **Shelat P.M.et al (2020)**[5] 6 (15%).

Neonatal deaths in present study was 6 (12%) which is comparable to **Kamble R.C. and Gupte N.S.(2018)**[2] 6 (10.7%) and **Kaur A.P. et al (2018)**[6] 8 (11.3%).

In present study, NICU admissions were in 25 (50%) which is comparable to **Tandon A. et al (2016)**[4] 130 (65.3%) and **Rakshit A. et al (2014)**[7] 50 (65.8%).

IUFD in present study was 4 (8%) as compared to **Kaur A.P. et al (2018)**[6] 23 (32.4%);**Tandon A. et al (2016)**[4] 38 (19.1%) and **Rakshit A. et al (2014)**[7] 14 (18.4%). In present study, incidence of eclampsia was 16(32%), abruption 8 (16%), PPH 3(6%), ARF 1(2%), DIC 6(12%), MODS 4(8%) and death 6(12%).

Shelat P.M. et al (2020)[5] reported eclampsia 6(15%), abruption 5(12.5%), PPH 6(15%), ARF 11(27.5%), DIC 9(22.5%), MODS 3(7.5%) and death 3(7.5%).

Kaur A.P.et al (2018)[6] reported eclampsia 15(21.1%), abruption 3(4.2%), PPH 8(11.3%), ARF 8(11.3%), DIC 4(5.4%) and death 14(19.7%).

Kamble R.C. and Gupte N.S. (2018)[2] reported abruption 8(14.3%),ARF 7(12.5%), DIC 11(19.6%), sepsis 2(3.6%) and death 8(14.3%).**Tandon A. et al (2016)**[4] reported eclampsia 68(34.2%), abruption 25(12.6%), ARF 31(15.6%), DIC 15(7.5%), MODS 15 (7.5%), sepsis 15(7.5%) and death 25(12.6%). **Rakshit A. et al (2014)**[7] reported eclampsia 26(34.2%), abruption 10(13.2%), ARF12(15.8%), DIC 6(7.9%), MODS 6(7.9%), sepsis 67.9% and death 10(13.2%).

CONCLUSION

Present study conducted on 50 cases of HELLP syndrome reveals majority of cases were unbooked and from rural areas. 68% required caesarean section and 78% required blood and blood products transfusion. Despite care in ICU and HDU there were 12% maternal deaths and 20% perinatal deaths.

1. Illiteracy and ignorance leading to poor compliance in antenatal care results in late diagnosis.
2. Diagnosis of HELLP syndrome is by clinical suspicion and confirmation by a laboratory tests which might not be available at peripheral centres.
3. Regular ANC and timely referral to well-equipped tertiary care centres if possible, in critical care ambulances is essential to bring down maternal and perinatal loss due to HELLP syndrome.

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