

Maternal and Neonatal Outcomes in HELLP Syndrome, Partial HELLP Syndrome and Severe Pre-Eclampsia: Eleven Years Experience of an Obstetric Center in the North of Iran

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Submitted: Sep 2, 2013; **Accepted:** Oct 8, 2013; **Published:** Dec 2, 2013

Abstract: *Objective:* This study aimed to determine the maternal and neonatal outcomes in hemolysis, elevated liver enzymes and low platelets syndrome (HELLP), partial HELLP syndrome (PHS) and severe pre-eclampsia: an eleven years experience of an obstetric center in the North of Iran. *Methods:* This retrospective observational study was done on pregnant women admitted in the Yahyanejad Hospital in the Babol University of Medical Science during 1998-2009. A total of 327 pregnant women were categorized into three groups: severe pre-eclampsia, PHS and HELLP syndrome. Data were analyzed by appropriate tests for continuous or categorical outcomes with differences considered significant if $P < 0.05$. *Findings:* Our finding demonstrated that the rate of caesarean section, blood transfusion, acute renal failure, admitting in Intensive Care Unit and liver hematoma were significantly greater in the pregnancy with HELLP syndrome versus severe pre-eclampsia ($p < 0.05$). *Conclusion:* Maternal and neonatal morbidities increased among that HELLP syndrome. So, immediate diagnosis and proper management could be attempted to improve maternal and prenatal outcomes.

Key words: HELLP Syndrome • Preclampsia • Partial HELLP Syndrome

INTRODUCTION

Hypertensive disorders of pregnancy were the most common medical complication that occurs in 5-10% of all pregnancies [1-2]. Among the types of gestational hypertension, pre-eclampsia is the most dangerous form is associated with proteinuria [2]. Pre-eclampsia is a multisystem disorder with unknown etiology that can observe as eclampsia or HELLP syndrome (hemolysis, elevated Liver enzymes and low platelets) [3]. The HELLP syndrome is a serious health hazard during pregnancy [1-4] and 60% of cases are required delivery by cesarean section [5].

The HELLP syndrome is characterized by the presence of all three major components, while partial HELLP syndrome (PHS) consists of only one or two elements of the triad [6]. Although, the incidence of HELLP syndrome varies from 2 to 12%, 5-20% of the patients with HELLP syndrome are associated with hypertension and proteinuria [7]. The incidence of PHS is greater and is probably estimated from 21 to 24 % [8]. Maternal outcome in HELLP syndrome include: hepatic rupture, acute renal failure (ARF), disseminated intravascular coagulation (DIC), abruption placenta, pulmonary and cerebral edema, intracranial hemorrhage and hypovolemic shock [7, 3]. Prenatal outcomes such as

respiratory distress syndrome (RDS), intra uterine growth restriction (IUGR) and intra uterine Fetal death (IUFD) were reported about 7.7- 60% in preterm delivery [9]. In a quest were reported patients with a history of HELLP are at the increased risk for preeclampsia and HELLP is associated with long-term morbidities such as depression and chronic hypertension [10].

Present study aimed to determine maternal and prenatal outcomes of HELLP syndrome and PHS, because there is a little information about it in the north of Iran. Then we compare maternal and prenatal outcomes between women with HELLP syndrome, PHS and women who have sever pre-eclampsia but normal laboratory tests for HELLP syndrome.

MATERIALS AND METHODS

This retrospective observational study done among admitted the patients in the Yahyanejad Hospital in the Babol Medical University during 1998 and 2009. We reviewed maternal and neonatal medical charts in women who were admitted with a diagnosis of sever pre-eclampsia, HELLP syndrome and PHS. Exclusion criteria included multiple pregnancy, fetal anomalies and patients with renal and liver disease, pre-eclampsia with PHS or HELLP syndrome and hematological diseases. Gestational age was determined from the first day in the last menstrual period (LMP), if women were unsure their LMP, the gestational age was used to the findings of a dating ultrasound scan that had been done before 20 weeks of pregnancy.

We received the ethic permission from the ethic committee of Babol University of Medical Science. Patients were categorized into three groups: severe pre-eclampsia, HELLP syndrome and PHS. Severe

pre-eclampsia was defined as a blood pressure $\geq 160/90$ mm Hg and proteinuria ≥ 2 in dipstick or proteinuria of at least 2g/24 h, intrauterine fetal growth restriction, persistent headache, persistent of epigastric pain, serum creatinin levels >1.2 mg/dl and visual disturbances but without alterations in laboratory tests for HELLP syndrome. HELLP syndrome is characterized based on three criteria, including: thrombocytes $< 100,000$ mm³, aspartate aminotransferase (AST) >70 UI/L, lactate dehydrogenase (LDH) > 600 UI/L and PHS was defined by the presence of one or two of these parameters. Maternal and neonatal data recorded in the records were reviewed for maternal outcome such as hepatic rupture, ARF, DIC, abruption placenta, pulmonary edema, cerebral edema, intracranial hemorrhage, hypovolemic shock and prenatal outcomes such as RDS, IUGR and IUFD. Statistical analyses were performed with the chi-square test and Fisher's Exact test and statistical significance was considered at $p < 0.05$.

RESULTS

In this retrospective study, out of 375 patients during 11 year with severe pre-eclampsia, HELLP syndrome and PHS after applying the exclusion criteria, 309 patients with severe pre-eclampsia, HELLP syndrome and PHS were enrolled and their maternal and neonatal outcomes were noted . 89(28.8%) patients with severe pre-eclampsia, 203 (65.7%) patents with PHS and 17(5.5%) patients with HELLP syndrome remained for the study. The mean age in our patients was 26.59 ± 5.85 . The Maternal demographic and clinical characteristics for severe pre-eclampsia, PHS and HELLP are shown in Table 1. We found the parity greater than one in 31 cases (34.8%) of the severe pre-eclampsia and 73 cases (36%) of the PHS and also,

Table 1: Maternal demographic and clinical characteristics in the three group under study

	Severe pre-eclampsia N=89	Partial HELLP syndrome N=203	HELLP syndrome N=17	P-Value
Age(yr)	26.39±5.69	26.67±6.03	26.65±4.76	0.93
Gravidity (%)				
1	50(56.2)	113(55.7)	8(47.1)	0.77
≥2	39(43.8)	90(44.3)	9(52.9)	
Parity (%)				
0	58(65.2)	130(64)	5(29.4)	0.015
≥1	31(34.8)	73(36)	12(70.6)	
Gestational age at delivery (wk)	35.83±3.61	35.84±2.94	33.76±2.58	0.031
Birth Weight (gr)	2582.06±907.13	2855.02±1267.67	1973.52±747.7	0.004

Sig is P<0.05

PHS; Partial HELLP Syndrome

HELLP; Hemolysis, Elevated Liver enzymes and Low Platelets

Table 2: Comprison of maternal and neonatal outcome in pregnancy in the three groups

Maternal neonatal outcomes	Severe pre-eclampsia N (%)	PHS N (%)	HELLP syndrome N (%)	P-Value	
IUFD	3(3.4)	3(1.5)	0(0.0)	0.46	
IUGR	5(5.6)	10(4.9)	3(17.6)	0.098	
FD	6(6.7)	11(5.4)	3((17.6)	0.02	
Preterm labor	48(3.9)	102(50.2)	3(17.6)	0.022	
NICU	20(22.5)	41(20.2)	3(17.6)	0.86	
Neonatal mortality	0(0)	0(0)	0(0)	0(0)	
Sex					
Male	80(89)	176(86.7)	11(64.7)	0.021	1 ver 3, 2 ver 3
Female	9(10.1)	27(13.3)	6(35.3)		
Induction of labor	36(40.4)	88(43.3)	11(64.5)	0.179	
Cesarean section	3(3.4)	6(3)	4(23.5)	<0.001	1 ver 3, 2 ver 3
Blood transfusion	0(0)	7(3.4)	4(23.5)	<0.001	1 ver3, 2 ver 3, 1 ver 2 ver 3
Postpartum hemorrhage	0(0)	3(1.5)	1(5.9)	0.134	
ARF	0(0)	0(0)	2(11.8)	<0.001	1 ver 3, 2 ver 3
Need to ICU	0(0)	1(0.5)	2(11.8)	<0.001	1 ver 3, 2 ver 3
Abruption placenta	8(9)	13(6.4)	3(17.6)	<0.22	
Maternal death	0(0)	0(0)	1(5.9)	<0.001	2 ver 3
liver hematoma	1(1.1)	3(1.5)	4(23.5)	<0.001	1 ver 3, 2 ver 3
Pulmonary edema	0(0)	0(0)	1(5.9)	<0.001	
Eclamcia	2(2.2)	2(1)	1(5.9)	<0.263	

Sig is P<0.05

PHS; partial HELLP Syndrome

HELLP; Hemolysis, Elevated Liver enzymes and Low Platelets

12(70.6%) of the HELLP syndrome. It revealed a significant difference between the three groups (p=0.015) on behalf of the HELLP group. The mean of gestational age in our patients was 35.72±3.15 wk. The gestational age at delivery and birth weight were lower significantly in the women with HELLP syndrome versus other groups. (P<0.031 and P<0.004 respectively).

Table 2 described the comparison of maternal and neonatal outcomes in the pregnant women with severe pre-eclampsia, PHS and HELLP syndrome. Maternal and neonatal outcomes in the pregnant women with severe pre-eclampsia versus PHS are not shown the statistical significant differences in any variables.

Also, the comparison of maternal and neonatal outcomes of the PHS syndrome with HELLP syndrome in the pregnant women were shown that the indication for caesarean section, blood transfusion, maternal death, ARF, need to Intensive care unit (ICU) and liver hematoma were significantly higher in the pregnancies with HELLP syndrome versus PHS (p<0.05). (Table 2).

Additionally, significant differences were displayed in the cesarean section, blood transfusion, ARF, maternal death, liver hematoma, pulmonary edema and need to ICU care among the three groups.

It is interesting in our research that 80(89%) of the infants of preclamcia women and 176(86.7) of PHS were male which demonstrated a significantly difference versus HELLP women.

DISCUSSION

Pre-eclampsia, PHS and HELLP syndrome are a life –threatening complication in the pregnancy. In the current study, indication for caesarean section, blood transfusion, acute renal failure, need to ICU care and liver hematoma displayed significantly greater in the women with the HELLP syndrome versus PHS and Pre-eclampsia. Some queries are inconsistence with our findings. Gul *et al* reported perinatal mortality and neonatal morbidity-mortality is nonsinificant in HELLP syndrome with severe preeclampsia-eclampsia without HELLP. Gul interpreted it is according to gestational age before and after the 32nd week [11]. Whereas, the mean of gestational age in our patients was 35.72±3.15 wk and also regarding the enhancement of the gestational consequences which synchronizes by growing pregnancy in these patients, hence, we contemplate diversity of Gul *et al* findings with us seems rationale.

The maternal and neonatal morbidities enhanced among our patients with the HELLP syndrome. Khumsat *et al* divided the patients in two groups: sever preclamcia and HELLP syndrome. Preterm delivery and eclamcia showed nonsignificant differences between two groups [9]. However, in Keiser' experience, eclampsia does not seem to apply a significant adverse influence upon the outcome of HELLP syndrome pregnancies [12].

We found no significant difference between patients age in the pregnant women with sever re-eclampsia, PHS and HELLP syndrome similar to some studies [7, 8]. However, Khumsat and his colleagues resulted women with HELLP syndrome were significantly older. Nevertheless, multiparty and lower gestational age were significant in the HELLP women in his study and us [9]. Our finding is also according to Vigil *et al.* and Habi *et al.* which reported gestational age can be considered a predictor for long-term consequences at the beginning of HELLP [13].

Also in our research, the preterm labor in pregnant women with pre-eclampsia, PHS and HELLP syndrome demonstrated significant difference, although it showed no significant difference within the groups, while Guzel *et al.* concluded fetal prematurity and low birth weight were significantly associated with fetal mortality in the HELLP syndrome, so he recommended the prevention of prematurity as a prime priority for the fetus in pregnancies involved with the HELLP syndrome [14]. We guess our difference with Guzel is in the small size of sever preclampsia women in his study.

Analysis of our data demonstrated that the rate of caesarean section and blood transfusion was greater in pregnancy with PHS than HELLP syndrome, however, ARF, admitted in ICU and liver hematoma was greater in pregnancy with HELLP syndrome than PHS. These results are accordance with Abbade *et al.* and also, Khumsat *et al.* studies. [8, 9]. Additionally, we found the rate of caesarean section, blood transfusion, ARF, admitted in ICU and liver hematoma were significantly higher in the pregnancies with severe pre-eclampsia and HELLP syndrome. Khumsat and Liu [9, 15]. revealed the same results.

The treatment of patients with pre-eclampsia and PHS and HELLP syndrome are in conflict. Pokharel believed that the exact diagnosis of HELLP syndrome and the immediate approach is so necessary in an obstetrics center. We contemplate the management of patients with pre-eclampsia and PHS is controversial. Abbade suggested prompt intervention enhances the cesarean rates and preterm delivery in PHS syndrome. He emphasized the women with PHS involved with some problems, however not as vigorous as in HELLP syndrome" and any aggressive and hastily procedures rare resulted to worsening of the maternal and prenatal outcomes. So, we also agree with him who recommended any decisions should make with caution and monitoring. Our study limitation was small sample size for HELLP syndrome which may beget a bias in the whole statistics.

Evaluation of the women complicated with HELLP syndrome in the multi prenatal centers of a region is suggested for investigate the interference environmental elements.

CONCLUSION

We found maternal and neonatal morbidities enhanced among the women complicated with HELLP syndrome. So, immediate diagnosis and proper management could be attempted to improve maternal and prenatal outcomes.

Conflict of Interest: The vice chancellor of Research and Technology of Babol University of Medical Science assisted us financially.

ACKNOWLEDGEMENT

We hereby thanks to all staffs of labor and delivery rooms of Yahyanejad Hospital for their cordially contribution.

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