Neonatal Outcome in Preeclamptic Women Presented with Antepartum Hemorrhage

Ishraq M Shakir (MBChB, FICOG)[1] **and Dunya A Yarrmorrad** (MBChB, DOG)[2]

Abstract

Background: Preeclampisa is common disorder among pregnant women in Erbil city that is characterized by high rates of neonatal morbidity and mortality in addition to maternal adverse complications.

Objective: To assess the neonatal outcomes of preeclamptic women presented with antepartum hemorrhage in Erbil city.

Patients and Methods: The study is a clinical prospective follow up study that was carried out in Labour room of Maternity Teaching Hospital in Erbil city through the period from 1st of March, 2018 to 28th of February, 2019 on sample of 200 preeclamptic pregnant women. The selected women and neonates were followed up for 1 week after delivery.

Results: The dead neonates represented 11.5% of total neonates for preeclamptic pregnant women, while low apgar score at 1 minute was present in 27% of the neonates and low apgar score at 5 minutes was present in 16% of them.Death neonatal outcome was significantly related to increased protein in urine, abnormal renal and liver functions and abnormal hemoglobin and platelets levels.A significant association was observed between preeclamptic pregnant women with antepartum hemorrhage and low apgar score of neonates at 5 minutes.

Conclusion: Neonatal outcome of preeclamptic pregnant women with antepartum hemorrhage is characterized by low apgar score at 5 minutes.

Keywords: Preeclampsia, Antepartum hemorrhage, Neonatal outcome.

Corresponding Author: dunyaahmed85@gmail.com

Received: 21th April 2019

Accepted: 2nd June 2019

DOI:https://doi.org/10.26505/DJM.17024620421

[1]College of Medicine- Hawler Medical University-Erbil-Iraq.

[2]Maternity Teaching Hospital- Erbil-Iraq.

Introduction

Pregnancy hypertensive diseases are the leading causes for higher rates of maternofetal morbidity and mortality all over the world. Preeclampsia is the more dangerous type of hypertensive disorders with no exact etiology [1].The preeclampsia is a multisystem highly variable disorder characterized by hypertension and protienurea; specific for pregnancy which affects about 3–8% of pregnancies[2]. The incidence of preeclampsia is close in both rich and poor communities; however, the burden of preeclampsia is higher in poor countries due to late diagnosis, poor nutrition

and bad obstetrical facilities [3].The incidence is high in developing countries due to hypoproteinemia, malnutrition and poor obstetric facilities. It was shown that 10–15% of women deaths are attributed to pre-eclampsia and eclampsia[4]. In Iraq, the major causes of maternal mortalities are postpartum hemorrhage, antepartum hemorrhage and preeclampsia [5]. Globally, the common risk factors for preeclampsia are family history, ethnicity and nulliparity [6], while high parity, hypoprotienemia and low socioeconomic level are the main risk factors of preeclampsia among Iraqi pregnant women[7].

The preeclampsia is highly complicated with postpartum hemorrhage and in less frequency by antepartum hemorrhage (APH) [8]. The APH is mainly caused by placenta previa and abruptio placentae [9]which are common complications of preeclampsia[10].The preeclampsia is hypertensive disorder associated with decreased blood perfusion attributed to vasospasm and coagulation cascade activation which affect many body systems. In addition to maternal risks, these systemic changes of preeclampsia with ischemic changes of antepartum hemorrhage lead to lowering supply of the oxygen and nutrients to fetuses which in turn threatening fetal life and affecting their growth and development[2, 11].

Adverse maternal complications of preeclampsia are hemorrhage, disseminated intravascular coagulation, abnormal liver function, low platelets count, renal dysfunction and others[12, 13]. For neonates, the outcome of preeclampsia is characterized by high mortality and morbidity rates. It was shown that preeclampsia is accompanied by 10 times risk of stillbirth in developing countries than developed countries and 1 to 4 of perinatal deaths and stillbirth are due to preeclampsia and eclampsia[14]. Neonatal complications shown to be related to preeclampsia are prematurity, intrauterine growth retardation, hematological complications, beonchopulmonary dysplasia and neurodevelopmental complications [15].

High incidence of preeclampsia in Erbil city that constituted to about 30.5% ofobstetrical complications[16] and scarcity of researches discussing the neonatal outcomes of preeclamptic women in Iraq or Kurdistan argued us to conduct this study which aimed to assess the neonatal outcomes of preeclamptic women presented with antepartum hemorrhage in Erbil city.

Patients and Methods

This study is a clinical prospective follow up study that was carried out in Labour room of Maternity Teaching Hospitalin Erbil citythroughthe periodfrom 1st of March, 2018to 28th of February, 2019. Preeclamptic pregnant women admitted to Labour room were the study population.Pregnancy with gestational age of 37 weeks and more and preeclampsia were the inclusion criteria. The exclusion criteria in this study were gestational age less than 37 weeks, fetal congenital malformations, moderate to severe oligohydrominous, moderate to severe intrauterine growth restriction, twin

pregnancy, old and macerated intrauterine fetal death and refused to participate.This study included a sample of 200 preeclamptic pregnantwomen was included in the study.

Following Helsinki Declaration intaking an oral informed consent from each pregnantwoman before inclusion in this study, an approval on study was taken from hospital authorities and the researcher was responsible in monitoring and managing selected pregnant women.

The woman's information was collected by the researcher through direct interview with women in labour room and filled in a prepared questionnaire designed by the researcher depending on previous literatures. The questionnaire included preeclamptic women general characteristics like age, parity, current antepartum hemorrhage (APH), previous history of APH, previous history of PE, investigations findings like protein in urine, renal function tests (RFT), liver function test (LFT), hemoglobin (Hb) and platelets, in addition to mode of delivery. For neonatal outcomes, the death and alive status of neonates was assessed and indicated as outcome in addition to apgar score at 1 and 5 minutes. The selected PE women and neonates were followed up for 1 weekafter delivery. The investigations were done in the Laboratory of Maternity Teaching Hospital, while the apgar score of neonates was measured by the Pediatrician in neonatal intensive care unit (NICU). The final status of neonates as dead or alive was assessed by the researcher.

Statistical analysis

The data collected were analyzed statistically by SPSS software version 22. Chi-square test and Fischer's exact testwere applied for analyzing the data as suitable. Level of significance (p value) was regarded statistically significant if it was 0.05 or less.

Results

Table (1): General characteristics of preeclamptic pregnant women (n=200)

Variable	**No. (%)**
Age mean±SD (30.2±7.2 years)	
<20 years	154 (7.0)
20-29 years	76 (38.0)
30-39 years	85 (42.5)
≥40 years	25 (12.5)
Parity	
Nulliparity	68 (34.0)
Multiparity	96 (48.0)
Grand multiparity	36 (18.0)
Current APH	
Yes	101 (50.5)
No	99 (49.5)
Previous history of APH	
Yes	20 (10.0)
No	180 (90.0)

Previous history of PE	
Yes	39 (19.5)
No	161 (80.5)
Protein in urine	
+	105 (52.5)
++	76 (38.0)
+++	19 (9.5)
RFT	
Normal	162 (81.0)
Abnormal	38 (19.0)
LFT	
Normal	175 (87.5)
Abnormal	25 (12.5)
Hb	
Normal	158 (79.0)
Abnormal	42 (21.0)
Platelets	
Normal	178 (89.0)
Abnormal	22 (11.0)
Mode of delivery	
Normal vaginal delivery	127 (63.5)
Cesarean section	73 (36.5)
Total	**200 (100.0)**

A total of 200 pregnant women with preeclampsia were included in this study with mean age 30.2 years, predominant age group was 30-39 years (42.5%). The parity history of preeclamptic pregnant women was distributed as followings; nulliparity (34%), multiparity (48%) and grand multiparity (18%). Current antepartum hemorrhage was detected in 50.5% of preeclamptic pregnant women, while previous history of APH was recorded for 10% of preeclamptic pregnant women. The previous history of preeclampsia was present among 19.5% of preeclamptic pregnant women. Protein in urine analysis of preeclamptic pregnant women revealed one plus in 52.5% of them, two pluses in 38% of them and three pluses in 9.5% of them. Renal function test was abnormal in 19% of preeclamptic pregnant women while liver function test was abnormal in 12.5% of them. The hemoglobin was abnormal in 12.5% of preeclamptic pregnant women and platelets tests was abnormal 11% of them. The mode of delivery for preeclamptic pregnant women was vaginal delivery in 63.5% of them and cesarean section in 36.5% of them.

Table (2): Neonatal outcomes of preeclamptic pregnant women (n=200)

Variable	No. (%)
Neonatal outcome	
Alive	177 (88.5)
Dead	23 (11.5)
Apgar score at 1 minute mean±SD (4.9±2.2)	
Normal	55 (55.0)
Low	27 (27.0)
Apgar score at 5 minutes mean±SD (7.8±2.29)	
Normal	168 (84.0)
Low	32 (16.0)
Total	**200 (100.0)**

Table (2) showed that 88.5% of preeclamptic pregnant women neonates were alive and 11.5% of them had dead neonates. Mean apgar score of preeclamptic pregnant women neonates at 1 minute was (4.9); 27% of neonates had low apgar score at 1 minute. Mean apgar score of preeclamptic pregnant women neonates at 5 minutes was (7.8); 16% of neonates had low apgar score at 5 minutes.

Table (3): General characteristics distribution of preeclamptic pregnant women according to neonatal outcomes (n=200)

Variable	Alive No. (%)	Dead No. (%)	P value
Age			0.5**
<20 years	12 (6.8)	2 (8.7)	
20-29 years	68 (38.4)	8 (34.8)	
30-39 years	77 (43.5)	8 (34.8)	
≥40 years	20 (11.3)	5 (21.7)	
Parity			0.5**
Nulliparity	61 (34.5)	7 (30.4)	
Multiparity	86 (48.6)	10 (43.5)	
Grand multi-parity	30 (16.9)	6 (26.1)	
Current APH			0.1**
Yes	86 (48.6)	15 (65.2)	
No	91 (51.4)	8 (34.8)	
Previous history of APH			0.2**
Yes	16 (9.0)	4 (17.4)	
No	161 (91.0)	19 (82.6)	
Previous history of PE			0.3**
Yes	33 (18.6)	6 (26.1)	
No	144 (81.4)	17 (73.9)	
Protein in urine			**0.05***
+	97 (54.8)	8 (34.8)	

++	66 (37.3)	10 (43.5)	
+++	14 (7.9)	5 (21.7)	
RFT			**<0.001***
Normal	153 (86.4)	9 (39.1)	
Abnormal	24 (13.6)	14 (60.9)	
LFT			**0.03***
Normal	158 (89.3)	17 (73.9)	
Abnormal	19 (10.7)	6 (26.1)	
Hb			**0.005***
Normal	145 (81.9)	13 (56.5)	
Abnormal	32 (18.1)	10 (43.5)	
Platelets			**<0.001***
Normal	165 (93.2)	13 (56.5)	
Abnormal	12 (6.8)	10 (43.5)	
Mode of delivery			0.09**
Normal vaginal delivery	116 (65.5)	11 (47.8)	
Cesarean section	61 (34.5)	12 (52.2)	

* Significant, ** Not significant

No significant differences were observed between preeclamptic pregnant women with alive neonatal outcome and those preeclamptic women with dead neonatal outcome regarding women age (p=0.5), parity (p=0.5), current APH (p=0.1), previous history of APH (p=0.2), previous history of PE (p=0.3) and mode of delivery (p=0.09). A significant association was observed between increased protein in urine and dead neonatal outcome of preeclamptic pregnant women (p=0.05). There was a highly significant association between abnormal renal function test and dead neonatal outcome of preeclamptic pregnant women (p<0.001). The abnormal liver function test was significantly associated with dead neonates of preeclamptic women (p=0.03). A significant association was observed between abnormal Hb of preeclamptic women and dead neonates (p=0.005). There was a highly significant association between abnormal platelets count and dead neonatal outcome of preeclamptic pregnant women (p<0.001).

Table (4): Distribution of neonates apgar scores at 1 and 5 minutes according to APH of preeclamptic pregnant women (n=200)

Variable	APH No. (%)	No APH No. (%)	P value
Apgar score at 1 minute			0.1**
Normal	21 (20.8)	29 (29.3)	
Low	80 (79.2)	70 (70.7)	
Apgar score at 5 minutes			**0.02***
Normal	79 (78.2)	89 (89.9)	
Low	22 (22.8)	10 (10.1)	

* Significant, ** Not significant

No significant difference was observed between preeclamptic pregnant women with APH and those preeclamptic women with no APH regarding neonates apgar score at 1 minute (p=0.1). A significant association was observed between preeclamptic pregnant women with APH and low apgar score of neonates at 5 minutes (p=0.02).

Discussion

The preeclampsia is regarded as one of major global health problems facing Gynecologists and Obstetricians as accompanied by high maternal and neonatal morbidity and mortality rates[17].

In this study, neonatal death was observed in 11.5% of preeclamptic women. In current study conducted by Azize et al [18]in Sulaimani city, maternal preeclampsia represented for 31% of early neonatal death in intensive care units of the city. This death rate is close to results of Saadat et al [19] study in Iran which documented neonatal death rate of 11.2% for preeclamptic pregnant women. Another study carried out in Iraq found that neonatal death was present in about 15% of pregnant women presented with eclamptic fits20. In general, reported neonatal death rate among preeclamptic women in current study is better than that reported by Aabidha et al [2] study in India as (15%), and better than results of van Esch et al [21] study in Netherlands which found that still birth rate of women with preeclampsia was 13% and infant mortality as 16%. Differences in neonatal death rates are due to differences facilities for in early diagnosis of preeclampsia, antenatal care quality and treatment characteristics of preeclampsia. Harmon et al[22] reported that fetal death with preeclampsia is maximized at early pregnancy than late pregnancy. Low apgar score was detected in 27% of neonates at 1 minute and in 16% of them at 5 minutes. This finding is similar to results of Khalil and Muhammed study in Sulaimani [32] which revealed a significantly lower apgar score at 1 and 5 minutes of neonates for preeclamptic pregnant women in comparison to healthy women.

Present study showed a significant association between increased maternal protein in urine and death neonatal outcome (p=0.05). Consistently, Kim et al [24] study in South Korea reported more neonatal morbidities are commonly associated with massive protienurea.Our study showed a significant association between each abnormal maternal renal and liver function tests and dead neonatal outcome. These findings are in agreement with results of Silva Junior et al [25] study in Brazil and Mahajan et al [26] study in India. Abnormal levels of hemoglobin and platelets were significantly higher with dead neonates of preeclamptic women. Yildrim et al [27] study in Turkey reported differences in hemoglobin and platelets levels between women with preeclampsia, eclampsia and HELP syndrome with obvious abnormal hematological levels for women with neonatal death.

Present study showed a significant association between preeclamptic pregnant women with APH and low apgar score of

neonates at 5 minutes (p=0.02).Our study reports are similar to Bhandary et al [11] study in UK which stated that antepartum hemorrhage is related to preterm delivery which is highly related to neonatal complications. Although no significant difference in neonatal death in current study, the coexistence of preeclampsia and antepartum hemorrhage potentiate the hazards on neonates specifically regarding abortion, early rupture of membranes and intrauterine growth restriction[28].

Conclusions

The neonatal outcome of preeclamptic pregnant women with antepartum hemorrhage is characterized by low apgar score at 5 minutes. Strengthening of national antenatal care system, strict monitoring of preeclamptic pregnant women and encouraging adherence to management are the main recommendations.

Acknowledgment

Great appreciation and thanks for all workers in Labour room in Maternity Teaching Hospital in Erbil cityfor their support.

References

[1]Dağdeviren H, Cankaya A, Cengiz H, Tombul T, Kanawati A, Caypınar SS, et al. Maternal and Neonatal Outcomes of Women with Preeclampsia and Eclampsia at a Tertiary Care Center. HASEKİ TIP BÜLTENİ 2015; 53:143-146.

[2]Aabidha PM, Cherian AG, Paul E, Helan J. Maternal and fetal outcome in pre-eclampsia in a secondary care hospital in South India. J Family Med Prim Care 2015; 4(2):257-260.

[3]Osungbade KO, Ige OK. Public health perspectives of preeclampsia in developing countries: implication for health system strengthening. J Pregnancy 2011; 2011:481095.

[4]Carty DM, Delles C, Dominiczak AF. Preeclampsia and future maternal health. J Hypertension 2010; 28:1349–1355.

[5]Al Kayat EA. Maternal Mortality in cities of Iraq for Three Years. Int J Curr Microbiol App Sci 2016; 5 (1): 590-611.

[6] Uzan J, Carbonnel M, Piconne O, Asmar R, Ayoubi JM. Pre-eclampsia: Pathophysiology, diagnosis and management. Vasc Health Risk Manag 2011; 7:467–474.

[7]Altaei A, Mohammad JM. Incidence and Risk Factors of Pre-eclampsia among Iraqi Pregnant women. AJPS 2012; 12 (2): 52-60.

[8]Ruiz MT, Azevedo CT, Ferreira MB, Mamede MV. Association between hypertensive disorders and postpartum hemorrhage. Rev Gaucha Enferm 2015; 36:55-61.

[9]Wasnik SK, Naiknaware SV. Antepartum Haemorrhage: Causes & Its Effects on Mother and Child: An Evaluation. Obstet Gynecol Int J 2015; 3(1):00072.

[10]Tasleem H, Tasleem S, Adil MM, Siddique M, Waheed K. Co-relation of Pregnancy induced Hypertension with Placental Abruption and Effect of Antihypertensive Therapy RMJ 2005; 30(2): 59-61.

[11]Bhandari S, Raja EA, Shetty A, Bhattacharya S. Maternal and perinatal

consequences of antepartum haemorrhage of unknown origin. BJOG 2014; 121(1):44-50; discussion 50-52.

[12]Chattopadhyay S, Das A, Pahari S. Fetomaternal Outcome in Severe Preeclamptic Women Undergoing Emergency Cesarean Section under Either General Or Spinal Anesthesia. J Pregnancy 2014; 2014:325098.

[13]Development Group (GDG) members, Guideline, Ashfaq K. NICE Clinical Guideline 127. Hypertension in Pregnancy: the Management of Hypertensive Disorders during Pregnancy 2010.

[14]Hodgins S. Pre-eclampsia as Underlying Cause for Perinatal Deaths: Time for Action. Glob Health Sci Pract. 2015; 3(4):525-527.

[15]Backes CH, Markham K, Moorehead P, Cordero L, Nankervis CA, Giannone PJ. Maternal preeclampsia and neonatal outcomes. J Pregnancy 2011; 2011:214365.

[16]Akrawi VS, Al-Hadithi TS, Al-Tawil NG. Major Determinants of Maternal Near-Miss and Mortality at the Maternity Teaching Hospital, Erbil city, Iraq. Oman Med J 2017; 32(5):386-395.

[17]Bokhari ZH, Yassob M, Intesar A, Fahim Ulhaq M. Neonatal Outcome in Patients with Preeclampsia. PJMHS 2014; 8 (4): 970-972.

[18]Azize P, Muhammad L, Kareem N. The causes of early neonatal death in Sulaimani Intensive Care Unit at Maternity Teaching Hospital between Jan 2016 - Feb 2017. KJAR 2017; 2 (2):121-127.

[19]Saadat M, Nejad SM, Habibi G, Sheikhvatan M. Maternal and neonatal outcomes in women with preeclampsia. Taiwan J Obstet Gynecol 2007; 46(3):255-259.

[20]Sarsam S, Madlol T, Raheem YA, Twaigery I. Presentation and Management Outcome of Eclampsia at AlElwiya Teaching Hospital. IASJ 2013; 12 (2): 277-281.

[21]van Esch JJA, van Heijst AF, de Haan AFJ, van der Heijden OWH. Early-onset preeclampsia is associated with perinatal mortality and severe neonatal morbidity. J Matern Fetal Neonatal Med 2017; 30(23):2789-2794.

[22]Harmon QE, Huang L, Umbach DM, Klungsøyr K, Engel SM, Manus P, et al. Risk of fetal death with preeclampsia. Obstet Gynecol 2015; 125(3):628-35.

[23]Khalil RY, Muhammed AS. Maternal Serum Uric Acid as an Index of Perinatal Outcomes in Severe Preeclampsia. KJAR 2018; 3 (2): 80-84.

[24]Kim MJ, Kim YN, Jung EJ, Jang HR, Byun JM, Jeong DH, et al. Is massive proteinuria associated with maternal and fetal morbidities in preeclampsia? Obstet Gynecol Sci 2017; 60(3):260-265.

[25]Silva Junior GS, Moreira SR, Nishida SK, Sass N, Kirsztajn GM. Urinary abnormalities and renal function in pregnant women with chronic hypertension. J Bras Nefrol 2016; 38(2):191-202.

[26]Mahajan P, Gupta V, Chaudhary A, Mehta S. Maternal and neonatal outcome in pre-eclamptic mothers with elevated liver enzymes: A prospective analytical study. IJOGR 2018; 5(2):233-238.

[27]Yıldırım G, Güngördük K, Aslan H, Gül A, Bayraktar M, Ceylan Y. Comparison of

perinatal and maternal outcomes of severe preeclampsia, eclampsia, and HELLP syndrome. J Turk Ger Gynecol Assoc 2011; 12(2):90-96.

[28]Moscuzza F, Belcari F, Nardini V, Bartoli A, Domenici C, Cuttano A, et al. Correlation between placental histopathology and fetal/neonatal outcome: chorioamnionitis and funisitis are associated to intraventricular haemorrage and retinopathy of prematurity in preterm newborns. Gynecol Endocrinol 2011; 27(5):319-323.