Neonatal Outcome in Preeclamptic Women Presented with Antepartum Hemorrhage

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Abstract

Background: Preeclampsia is a 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.

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Received: 21th April 2019
Accepted: 2nd June 2019
DOI:https://doi.org/10.26505/DJM.170242620421

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 proteinuria; 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
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 preeclampsia 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, hypoproteinemia 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, bronchopulmonary dysplasia and neurodevelopmental complications [15].

High incidence of preeclampsia in Erbil city that constituted to about 30.5% of obstetrical 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 city through the period from 1st of March, 2018 to 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 oligohydrominosus, 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 pregnant women was included in the study.

Following Helsinki Declaration intaking an oral informed consent from each pregnant woman 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 week after 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 test were applied for analyzing the data as suitable. Level of significance (p value) was regarded statistically significant if it was 0.05 or less.

Results

| 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) |
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**                    |               |              |         |
| <20 years                  | 12 (6.8)      | 2 (8.7)      | 0.5**   |
| 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**                 |               |              |         |
| Nulliparity                | 61 (34.5)     | 7 (30.4)     | 0.5**   |
| Multiparity                | 86 (48.6)     | 10 (43.5)    |         |
| Grand multi-parity         | 30 (16.9)     | 6 (26.1)     |         |
| **Current APH**            |               |              |         |
| Yes                        | 86 (48.6)     | 15 (65.2)    | 0.1**   |
| No                         | 91 (51.4)     | 8 (34.8)     |         |
| **Previous history of APH**|               |              |         |
| Yes                        | 16 (9.0)      | 4 (17.4)     | 0.2**   |
| No                         | 161 (91.0)    | 19 (82.6)    |         |
| **Previous history of PE** |               |              |         |
| Yes                        | 33 (18.6)     | 6 (26.1)     | 0.3**   |
| No                         | 144 (81.4)    | 17 (73.9)    |         |
| **Protein in urine**       |               |              |         |
| +                          | 97 (54.8)     | 8 (34.8)     | 0.05*   |
Neonatal Outcome in Preeclamptic Women Presented with Antepartum Hemorrhage

Ishraq M Shakir

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** |             |                |         |
| Normal                    | 21 (20.8)   | 29 (29.3)      | 0.1**   |
| Low                       | 80 (79.2)   | 70 (70.7)      |         |
| **Apgar score at 5 minutes** |            |                |         |
| Normal                    | 79 (78.2)   | 89 (89.9)      | 0.02*   |
| 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 city for their support.

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Neonatal Outcome in Preeclamptic Women Presented with Antepartum Hemorrhage

Ishraq M Shakir

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