


Original article

Evaluation of Maternal and Perinatal Outcomes in Pregnancy with Preeclampsia at Aljala Maternity Hospital

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ABSTRACT

Hypertensive disorders of pregnancy (HDP) accounts for 18% of maternal deaths worldwide, with an estimated number of about 62, 000–77, 000 deaths occur each year. The current study aimed to assess maternal and perinatal outcomes of pregnancies complicated by hypertension in Aljala Maternity Hospital. A retrospective, descriptive, case series analysis for four hundred patients was done on the outcome of hypertensive disorder among pregnant women who admitted and were managed at Aljala teaching hospital with preeclampsia during the years 2019 and 2020. Demographic data involving age, parity, gestational week, clinical and laboratory findings were recorded from the medical files. Additionally, delivery route, indications of cesarean section, fetal and maternal complications were determined. The current finding reported high prevalence of perinatal and maternal mortality among pregnant women with preeclampsia. Moreover, other severe maternal and perinatal complications such as Hemolysis Elevated Liver Enzyme Platelet (HELLP) syndrome, placental abruption, eclamptic fits, as well as low birth weight were also commonly reported. The current study showed early onset of preeclampsia was associated with increased risk of developing adverse maternal-fetal/neonatal outcomes compared to late-onset after 36 weeks. Our findings call for special consideration and close surveillance of those women with early-onset diseases.

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INTRODUCTION

Globally, hypertensive disorders of pregnancy complicate 3–10% of all pregnancies and it is a major cause of maternal and perinatal complications [1,2]. Hypertensive disorders of pregnancy (HDP) accounts for 18% of maternal deaths worldwide, with an estimated number of about 62, 000–77, 000 deaths occur each year [2]. Due to the existing low level of health service utilization and poor quality of maternal and neonatal care, the maternal and perinatal morbidities are much higher in low and middle -income countries (LMICs) [3]. For instance, 19% of all maternal deaths in Ethiopia are attributed to hypertensive disorders of pregnancy [3]. Hypertensive disorders of pregnancy were also reported to account for 30% of maternal mortality in Ghana [4].

Maternal complications of hypertensive disorders of pregnancy include placental abruption, pulmonary edema, thrombocytopenia, hemolytic anemia, stroke, recurrent seizure, renal damage, hepatic injury and others. Hemolysis Elevated Liver Enzyme Platelet syndrome (HELLP) which occurs in about 0.5 to 0.9% of all pregnancies and complicates 10 to 20% of women with severe preeclampsia. HELLP syndrome is one of the common causes of maternal and fetal mortality among pregnant women with hypertension.

Although hypertensive disorders of pregnancy are among the leading causes of maternal and perinatal deaths, there is no pooled national evidence that demonstrates the fetomaternal outcomes of pregnancies complicated by the disorder. Therefore, the current review aimed to assess the maternal as well as perinatal outcomes of pregnancies complicated by preeclampsia.

Preeclampsia is defined as a systemic syndrome characterized by the new onset of raised blood pressure $>140/90$ mm Hg and proteinuria after 20 weeks of gestation in a previously normotensive woman [3]. Globally preeclampsia complicates 2–8% of pregnancies and contributes to 10–15% maternal death [4]. It's called preeclampsia without severity feature in the absence any of the following features: cerebral symptoms (like visual disturbance, headache), right upper quadrant or epigastric pain, serum transaminase concentration \geq twice normal, systolic blood pressure \geq 160 mm Hg, and or diastolic blood pressure \geq 110 mm Hg on two occasions at least four hours apart, severe thrombocytopenia ($<100,000$ platelets/micro), Oliguria <500 mL in 24 hours and pulmonary edema [5-7].

The only curative treatment of preeclampsia is birth. However, in the case of preterm pregnancies, expectant management is advocated to increase the chance of fetal maturity, if the risk for the mother remains acceptable [8]. The Hypertension and Preeclampsia Intervention Trial At near Term (HYPITAT) which is a multicenter RCT comparing expectant management versus induction of labour in a woman with mild gestational hypertension or mild preeclampsia at 36 to 37 weeks of gestation has shown that routine induction was associated with a significant reduction in composite adverse maternal outcome without affecting the neonatal outcome [9]. An observational study has also shown that the onset of mild gestational hypertension or mild preeclampsia at or near term is associated with minimal to low maternal and fetal complications [10].

World Health Organization (WHO) recommends expectant management of preeclampsia without severity feature until 37 weeks. Patients will visit their physician once per week and evaluated for any severe features by history, blood pressure (BP) measurement, laboratory evaluation, and obstetric ultrasound. The justification for expectant management was the risk of increased assisted vaginal delivery, cesarean section and prematurity, and its complication, thus generating additional morbidity and cost [11]. On the other hand, there is the possibility of progression of the preeclampsia leading to eclampsia, severe hypertension, abruption, pulmonary edema, HELLP (Hemolysis, Elevated liver Enzymes and Low Platelet) syndrome and adverse neonatal outcome [12].

The optimal management of preeclampsia without severe features remains controversial especially in developing countries where home-based self-care like blood pressure monitoring is barely possible. Limited studies suggest that patients offered outpatient monitoring should be able to comply with frequent maternal and fetal evaluations, some form of blood pressure monitoring at home and should have ready access to medical care. The aim of the study was to determine the maternal and perinatal outcome of expectantly managed pregnant women with a diagnosis of preeclampsia at the Aljala teaching hospital in Tripoli, Libya.

METHODS

Study design and setting

A retrospective descriptive case series study was carried in on 400 patients with preeclampsia and had delivered at Aljala teaching hospital through the years from 2019 to 2020. Ethics approval was obtained from official consent taking from the medical staff and the institute to collect the data from patients' medical record, and confidentiality of the information was maintained throughout by excluding names in the study.

Data collection

The data was collected using a predesigned questionnaire filled from the medical records of the patients diagnosed with preeclampsia and managed accordingly in Aljala hospital. Demographic data involving age, parity, gestational week, clinical and laboratory findings were recorded from the medical files. Additionally, obstetric and gynecological history, history of current pregnancy, mode of delivery, and neonatal and maternal complications were determined.

Statistical analysis

Statistical analysis was performed using the Statistical Program for Social Sciences (SPSS version 22) that used for data entry and analysis. Descriptive statistics were used and all results are presented as frequencies, means \pm standard deviation and percentages. A P-value of less than or equal to 0.05 was considered statistically significant. Categorical data were compared using the Chi-square test and Fisher's exact test if appropriate.

RESULTS

Patient demographics

As shown in table 1, more than half of the participated patients had the age 26-35 years. The least age group were between 16-25 years which was 16.5% of the women. The mean was (31.37±9.49 year), and the range of the age (16-44 Year). Half of the participated patients had more than 36 weeks of the gestational age (nearly term at the time of diagnosis with preeclampsia, 48.5% were in the third trimester (28-36 weeks), and only five patients had hypertensive disorder in the second trimester which accounts 1.3% of the participated women. A bout 195 women had a parity between one and three which accounts 48.8% of the participated patients. The maximum parity was 9 where had two women with parity 9. About 35.8% of the pregnancy had period of two years of interval between the previous pregnancy. The maximum interval was ten years which accounts 0.3%, and the least one was no interval which accounts 28.5%. Most of the participated women had previous history of hypertension (79.3%).

Table 1. Patient demographics.

Patient demographics	Frequency (%)
Age of the patients	
16-25 years	66 (16.5%)
26-35 years	211 (52.8%)
36-45 years	123 (30.7%)
Gestational age	
<28 weeks	5 (1.3%)
28-36 weeks	194 (48.5%)
>36 weeks	201 (50.2%)
Parity	
0	115 (28.7%)
1-3	195 (48.8%)
4-6	83 (20.7%)
>6	7(1.8%)
Period interval between pregnancy	
0	114 (28.5%)
1	49 (12.3%)
2	143 (35.8%)
3	69 (17.3%)
4	11 (2.8%)
5	7 (1.8%)
6	5 (1.3%)
9	1 (0.3%)
10	1 (0.3%)
History of hypertension	
Yes	317 (79.3%)
No	83(20.7%)

Maternal Outcome

In table 2, the maternal complication of HELLP syndrome in the participated patient's was 11.5%. About 5.3% of the participated women had history of eclamptic fit attack. 148 of the women had admitted to intensive care unit which accounts 37%of the participated patients. Approximately, 88% of the women with preeclampsia had complicated with abruptio placenta which accounts 22% of the patients. Most of the neonates of the mother with preeclampsia had admission to neonatal intensive care unit (around two third of the participated patients) which accounts 63.7%. About 53% of the birth weight of the neonates of the participated mothers were between 2500g and 4500g (within average birth weight). On the other side, nearly half of the participated patients had birth weight less than average (about 46.5%), and only two neonates were big size baby (more than 4500g). Around 23 % of the neonates of the outcome of the pregnancy with preeclampsia were died neonates in the participated women which accounts 5.7% of the total 400 patients. About 22.1% of the pregnancy with preeclampsia in the participated women had intrauterine growth retardation.

Around three fourth of the finding of Doppler ultrasonography were normal (76.5%), and the rest 94 of the examined patients by Doppler U/S were abnormal finding (23.5%). Approximately, 88% of the women had no history of infertility in their obstetric history.

Table 2. Maternal outcomes of the involved participants

Maternal outcomes	Frequency (%)
HELLP Syndrome	
Yes	46 (11.5%)
No	354 (88.5%)
Eclamptic fits	
Yes	21 (5.3%)
No	379 (94.7%)
ICU admission	
Yes	148 (37%)
No	252 (63%)
Abruptio placenta	
Yes	88 (22%)
No	312 (78%)
NICU admission	
Yes	255.7 (63.7%)
No	145 (36.3%)
Birth weight	
<2.5kg	186 (46.5%)
2.5kg-4.5kg	212 (53.0%)
>4.5kg	2 (0.5%)
Neonatal outcome	
Alive	377 (94.3%)
Died	23 (5.7%)
Intrauterine growth retardation	
Yes	89 (22.1%)
No	311 (77.9%)
Doppler U/S	
Normal Finding	306 (76.5%)
Abnormal	94 (23.5%)
H/O infertility	
Yes	48 (12%)
No	352 (88%)

Most of the pregnancy with preeclampsia underwent emergency cesarean section (69.1). The least percentage for mode of delivery was 5% of the participated women had spontaneous normal vaginal delivery (figure 1).

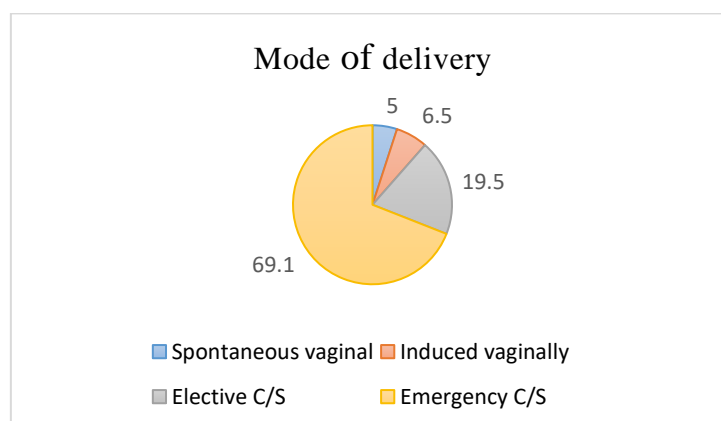


Figure 1. Mode of delivery

DISCUSSION

The current study deals with preeclampsia where the highest age group was 26–35 year. The gestational age at the time of diagnosis was between >36 weeks in 50.2% of the participants and 48.5% of the pregnant women presented at a gestational age between 28–36 weeks. This finding is comparable to a study conducted in India that showed the incidence of late-onset preeclampsia (beyond 34 weeks) to be 72.4% and early-onset preeclampsia 27.6% with higher maternal and perinatal complications in early-onset preeclampsia [13].

The average duration of expectant management was 4.6 weeks and 34.1% of women developed one or more of the maternal, fetal or neonatal complications. In our study maternal complication was HELLP syndrome (11.5%), ICU admission (37%), eclamptic (5.3%), and abruptio placenta (22%). These complications are high compared to a retrospective analysis of the incidence of severe disease in mild preeclampsia in China which showed 6% of preeclampsia women developed one of the following severe features: placental abruption (2.8%), eclampsia (0.9%) and HELLP syndrome (0.6%). There were two (1.22%) cases of eclampsia and maternal death in the current study which was high for women on follow up compared to similar study which might imply outpatient follow up with once per week visit is inadequate for early identification and management of progression to severe preeclampsia.

The current study showed early onset of preeclampsia was associated with increased risk of developing adverse maternal-fetal/neonatal outcomes compared to late-onset after 34 weeks. The increased perinatal complication seen might be explained by the progression of preeclampsia to severe diseases in those women who developed preeclampsia before 34 weeks.

HELLP syndrome complicates 11.5% of the pregnant women with preeclampsia. This finding is line with a study conducted previously which reported a 10 to 20% rate of HELLP syndrome among women admitted for the diagnosis of preeclampsia. The much higher rate of HELLP syndrome as compared to women without hypertensive disorders (0.5–0.9%) could be explained by the pathological course of the disease. In preeclampsia for example, defective placental vascular remodeling around midsecond trimester of pregnancy with the second round of trophoblastic invasion into the deciduas results in inadequate placental perfusion. The hypoxic placenta then releases various placental factors such as soluble vascular endothelial growth factor receptor-1 (sVEGFR-1), which then binds vascular endothelial growth factor (VEGF) and placental growth factor (PGF), causing endothelial cell and placental dysfunction by preventing them from binding endothelial cell receptors. This results in increased platelet activation and aggregation leading to low platelet count, hemolysis and hepatic injury [14].

Pulmonary edema, acute kidney injury, hepatic injury, placental abruption, aspiration pneumonia, and other life treating complications were also reported by included studies. The above-mentioned complications were reported by the 2014 world health organization (WHO) multinational analysis using 29 countries from Africa, Asia, Latin America and Middle East [15].

In this study reported that the most common neonatal complication was NICU admission (63.7%), low birth weight (46.5%), IUGR (22.1%), and still birth (5.7%). This finding is comparable to other study findings but since these studies are reporting on cumulative preeclampsia it's difficult to make an exact comparison [16].

In this study, low birth weight complicates more than one-third of women with preeclampsia (46.5%). This rate is much higher than the rates reported in a study conducted in China (6.8%); and, a review conducted among women with chronic hypertension (16.9%) [17]. Perinatal asphyxia, preterm birth and other complications have been also reported in the studies included in the review. Although the exact mechanisms for the above-mentioned perinatal complications are not yet well known, the most acceptable theory for the development of preeclampsia is defective remodeling of spiral arteries. Defective placentation affects utero-placental blood flow and leads to complications such as preterm birth, low birth weight, perinatal asphyxia, and fetal growth restriction [18]. An Indian study reported that the most common neonatal complication was prematurity (23.65%), low birth weight (7.52%) and intrauterine growth restriction (9.67%) [19].

This study has some limitations. The data may not be representative of outcomes in low-level facilities or in the community. Furthermore, there is a high level of heterogeneity among the included studies that should be taken in consideration while using the results of the review. The current study has limitations. Additionally, having gestational age-matched non-exposed (without preeclampsia) group would have been important to controlling confounders like the quality of care and preterm birth associated morbidity and mortality.

Despite these possible limitations, the review provides useful information that may contribute to both the filling of the gaps in the national maternal morbidity research agenda and guiding practice and policy about the most frequent complications of preeclampsia.

CONCLUSION

This review demonstrated the high prevalence of perinatal and maternal mortality among pregnant women with preeclampsia. Moreover, other severe maternal and perinatal complications such as HELLP syndrome, placental abruption, eclamptic fits, as well as low birth weight were also commonly reported. The current study showed early onset of preeclampsia was associated with increased risk of developing adverse maternal-fetal/neonatal outcomes compared to late-onset after 36 weeks. Our findings call for special consideration and close surveillance of those women with early-onset diseases.

Conflict of interest

There is no conflict of interest

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تقييم نتائج الأمومة والفترة المحيطة بالولادة في الحمل مع تسمم الحمل في مستشفى الجلاء للولادة

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المستخلص

تمثل اضطرابات الحمل الناجمة عن ارتفاع ضغط الدم 18% من وفيات الأمهات في جميع أنحاء العالم، ويقدر عدد الوفيات التي تحدث كل عام بحوالي 62,000-77,000 حالة وفاة. تهدف الدراسة الحالية إلى تقييم النتائج الأمومية والفترة المحيطة بالولادة لحالات الحمل المعقدة بسبب ارتفاع ضغط الدم في مستشفى الجلاء للولادة. تم إجراء تحليل وصفي بأثر رجعي لسلسلة حالات لأربعمئة مريضة حول نتائج اضطراب ارتفاع ضغط الدم بين النساء الحوامل اللاتي أدخلن إلى مستشفى الجلاء التعليمي وخضعن للعلاج في مستشفى الجلاء التعليمي مصابات بتسمم الحمل خلال عامي 2019 و2020. البيانات الديموغرافية التي تتضمن العمر والولادات وأسبوع الحمل وتم تسجيل النتائج السريرية والمخبرية من الملفات الطبية. بالإضافة إلى ذلك، تم تحديد مسار الولادة، ومؤشرات العملية القيصرية، ومضاعفات الجنين والأم. أفادت النتيجة الحالية عن ارتفاع معدل وفيات الفترة المحيطة بالولادة ووفيات الأمهات بين النساء الحوامل المصابات بتسمم الحمل. علاوة على ذلك، تم أيضاً الإبلاغ بشكل شائع عن مضاعفات خطيرة أخرى للأمهات والفترة المحيطة بالولادة مثل متلازمة انحلال الدم المرتفع في إنزيم الكبد، وانفصال المشيمة، ونوبات الارتعاج، فضلاً عن انخفاض الوزن عند الولادة. أظهرت الدراسة الحالية أن البداية المبكرة لتسمم الحمل كانت مرتبطة بزيادة خطر الإصابة بنتائج سلبية على الأم والجنين/المواليد مقارنة بالبداية المتأخرة بعد 36 أسبوعاً. تدعو النتائج التي توصلنا إليها إلى إيلاء اهتمام خاص ومراقبة وثيقة لهؤلاء النساء المصابات بأمراض مبكرة.

الكلمات الدالة: الحمل، تسمم الحمل، مستشفى الجلاء للولادة، ليبيا.