COMPARISON OF ADVERSE FETOMATERNAL OUTCOME IN EARLY AND LATE ONSET PREECLAMPSIA

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ABSTRACT

Objective: To compare adverse feto-maternal outcome between women with early and late onset preeclampsia.

Methodology: This cross sectional study was conducted in Gynecology and Obstetrics and Gynecology Department, Lady Reading Hospital, Peshawar from March 2016 to September 2016. A total of 254 patients having singleton pregnancy of more than 20 weeks were included. Week 34 was used as a cutoff to classify patients into Early Onset Preeclampsia (EOPE) and Late Onset Preeclampsia (LOPE). All the subjects were followed up till one week after delivery to compare adverse fetomaternal outcome. SPSS version 25 was used for data analysis.

Results: Out of 254 patients, 172 (67.7%) patients had LOPE while 82 (32.3%) presented with EOPE. The mean Body Mass Index (BMI) for EOPE and LOPE was 25.25±1.70kg/m^2 and 25.97±2.03kg/m^2, respectively. Most of the patients were multigravida in both groups, 43 (52.4%) in EOPE and 122 (70.93%) in LOPE. Preterm birth was more common in the EOPE (n=49, 59.75%) as compared to LOPE (n=60, 34.88%) with a p-value of ≤0.05. LOPE group had more cesarean sections (n=62, 36.02%) than EOPE (n=16, 19.53%) with a p-value of ≤0.05. Neonatal Intensive Care Unit (NICU) admissions were more common in EOPE group (60.92%) as compared to LOPE (41.82%) having a p-value of ≤0.05. Neonatal deaths and small for gestational age was found to be insignificant in the two groups.

Conclusion: Preterm birth and NICU admissions were more common in EOPE while cesarean section was more commonly done in LOPE.

Key Words: Fetomaternal; Outcome; Preeclampsia.

INTRODUCTION

One of the most common causes of maternal and fetal morbidity and mortality is a pregnancy-specific syndrome called preeclampsia (PE).[1] It is one of the many hypertensive disorders of pregnancy which causes complications in approximately 12% - 22% of all pregnancies and, after embolisms, are the leading cause of maternal mortality.[2] Children born from pre-eclamptic pregnancies exhibit a 1.5–2 times greater risk of perinatal and infant mortality.[3] Mild cases of pre-eclampsia also bring about serious perinatal outcomes including intrauterine growth retardation, prematurity, low birth weight, and stillbirth.[4]

Preeclampsia is associated with hypertension and proteinuria. The obstetricians define hypertension as a systolic blood pressure reading of ≥140 mmHg and/or diastolic blood pressure ≥ 90 mmHg found twice in a 4-hour interval after 20 weeks of gestation in both women with a history of chronic hypertensive disorders and women with normal blood pressure prior to conception.[5] Despite extensive research, the etiology of preeclampsia is still not clear. Some predisposing factors include high body mass index (BMI), pre-existing diabetes, maternal age, nulliparity, multiple pregnancy, personal or family history of preeclampsia, renal disease, chronic autoimmune disease and hypertension or raised blood pressure at booking.[6]

PE is syndromic in nature. Therefore, attempts have been made to classify the cases of PE into distinct categories to achieve a better understanding of its pathophysiology and to develop individualized preventive interventions or treatment plans by predicting the feto-maternal outcomes.[7,8] Fetal and maternal complications and severity of symptoms are used in the clinical classification of PE as mild or severe.[9] Gestational age at delivery or diagnosis is used as the determinant in another classification of PE as early or late onset[10], with 35 weeks being the cutoff value.[11] The later approach has a high prognostic value as Early Onset Preeclampsia (EOPE) frequently results in more serious fetal and maternal complications than Late onset Preeclampsia (LOPE), which often exhibits less severe clinical symptoms.[12] Thus, evolving evidence suggests that gestational age at disease onset is inversely proportional to both the degree of impaired placentation and the occurrence of adverse fetal and maternal short-term and long-term consequences of preeclampsia.[13]

Pakistan, a developing country in Asia, is facing lack of research on preeclampsia which is one of the leading causes of its high maternal mortality ratio of 1 in 89.[14] Although preeclampsia has known maternal and fetal complications, regular collection and generation of statistics is the only way whereby burden, trend and complications of the disease can be assessed. This definitely has a positive effect on management of patients. The current study was conducted with the same intention to determine complications of early and late onset preeclampsia in local setup and hence to devise departmental protocols for better patient management in future.

METHODOLOGY

This was a cross sectional study conducted from March to September 2016 at the department of obstetrics and gynecology, Lady Reading Hospital Peshawar. Sample was collected with non-probability consecutive sampling. Sample size of 254 was calculated by using online calculator Raosoft Inc. considering demographic data of district Peshawar of 2013.[15] The women included were those having singleton pregnancies and were more than 20 weeks of gestation, while women with history of hypothyroidism, multiple pregnancies confirmed with ultrasound, obesity, congenitally abnormal fetal features on ultrasound scan and women with preexisting history of renal diseases were excluded.

Approval was taken from the hospital's ethics and research board prior to the study. Written, informed consent was also obtained from all the ladies included in the study. The duration of 34 weeks was used as cutoff value in the classification of patients into early onset and late-onset preeclampsia; women who showed the symptoms of PE between 20 and 34 weeks of gestational age were classified as early onset preeclampsia, while those who developed PE after 34 weeks, were categorized into late-onset preeclampsia. The diagnostic criteria was defined as blood pressure of 140/90mmHg on two occasions, four hours apart, with 24 hours urine collection showing proteinuria of 300mg or more. As per antenatal protocols, routine laboratory investigations were performed. All these women were admitted initially for complete workup and stabilization. Women who needed delivery for fetomaternal indications were either induced or underwent cesarean section. Those who were stable and were decided to manage conservatively (early onset cases, preterm late onset) were discharged. These patients were actively followed up on weekly basis till they get re admitted and delivered. At each follow up visit, complete clinical assessment, ultrasound assessment and laboratory work up was carried out. After delivery, all the patients were followed up for further one week for early neonatal outcome like neonatal death (NND).

Data was analyzed using SPSS version 25. Mean ± SD was calculated for numerical variables like age, gestational age and BMI. Frequencies and percentages were calculated for categorical variables like EOPE, LOPE, parity, fetal outcome like small for gestational age (SGA), NND, Prematurity, Neonatal Intensive Care Unit (NICU) admissions and cesarean section. Chi square test was applied to determine association between type of pre eclampsia (early and late onset) and various fetomaternal outcomes. A p-value of ≤ 0.05 was taken as significant.

RESULTS

Out of 254 patients, those with LOPE were 172 (67.7%) and those with EOPE were 82 (32.3%). The age range for both groups was 20-35 years. The mean age for early onset group was 24.35±3.13 while the mean age for late onset group was 26.6±4.23 years. The mean BMI for early onset pre eclampsia group was 25.25±1.70 and for late onset group, it was 25.97±2.03 kg/m^2. Mean gestational age for early onset preeclampsia was 32.58±1.24 and for LOPE, it was 36.43±1.38 years. Majority of the patients, i.e. 54 (65.8%) in early onset group were in the age range 20 - 25 years, while in the late onset group, majority of patients were in the age range 26-30 years (43.60%). Most of the patients were multigravidas in both groups, 43 (52.4%) in EOPE group and 122 (70.93%) in the LOPE group. Table 1 shows demographic data of the patients.

Among the fetomaternal outcomes, it was found that preterm birth was more common in the EOPE group, as compared to the LOPE group; 49 (59.75%) vs. 60 (34.88%) with a p-value of 0.0001. Similarly, statistically significant difference was found for cesarean section between two groups, being more common in LOPE group as compared to EOPE; 62 (36.02%) vs. 16 (19.53%) with a p-value of 0.008. The details are given in table 2.

DISCUSSION

The current study showed that both EOPE and LOPE were more common in women who were multigravidas and with high BMI. Preterm births and NICU admission werre significantly more in early onset group,while caesarean section was significantly increased in LOPE.

Gomathy et al however found EOPE more in multi gravidas and LOPE more in primigravidas.This difference can be coincidental because age range and sample size of our study matches with the Gomathy et al and comorbidities have been excluded in both cases.[16]

The finding of preeclampsia more in multigravidas is again in contrast with the findings of Hernandez et al who found that risk of preeclampsia was 4.1% in first pregnancy and 1.7% in the following ones.[17] Difference in population characteristic may account for these changes in results. Preeclampsia is known for its maternal and fetal complications leading to medically indicated preterm births. More than half of the patients in this study with EOPE had preterm delivery as compared to only 34% in late onset group. These findings are supported by study conducted by Wojtowicz et al where mean gestational age at birth and mean birth weight were significantly lower in EOPE as compared to late onset (p<0.001).[12] Parallel to preterm delivery rate, 60% newborns in EOPE group had NICU admission. Bozdag et al had quoted 91% NICU admission rate in EOPE group and 34% in LOPE.[18] Adverse neonatal outcome in preterm deliveries are combined effect of preeclampsia and immaturity of fetal organs resulting in sepsis,breathing difficulties and long term intellectual issues.

Thirt six percent patients with LOPE had caesarean section in this study, while almost 80% of patients with EOPE had vaginal deliv-

Table 1: Demographic characteristics of the patients (n=254)

Variables	Early onset preeclampsia (n=82)	Late onset preeclampsia (n=172)
Age		
20-25 years	54 (65.83%)	68 (39.52%)
26-30 years	26 (31.74)	75 (43.60%)
31-35 years	02 (2.43%)	29 (16.87%)
Parity		
Primipara	39 (48.75%)	50 (29.06%)
Multipara	43 (52.40%)	122 (70.93%)
Body Mass Index (kg/m^2)		
≤ 25 kg/m2	48 (58.53%)	66 (38.37%)
≥ 25 kg/m2	34 (41.47%)	106 (61.63%)

Table 2: Fetomaternal outcome of early and late onset preeclampsia

Variables	Early Onset Preeclampsia	Late Onset Preeclampsia	p-value
Prematurity	49	60	0.001
Cesarean section	16	62	0.008
NICU admissions	50	72	0.004
Small for gestation	24	51	0.95
Neonatal deaths	08	22	0.48

NICU = Neonatal Intensive Care Unit.

ery. Coviello et al[19] and Nassar et al[20] in their studies found 46% and 48% vaginal delivery rate in EOPE. Due to limited NICU facilities and poor neonatal outcome at early gestational age, vaginal delivery is favoured in our local setup if it is not endangering mothers life and health. Our study findings are also different from Gomathy et al where 53.3% patients in EOPE and 58,6% in LOPE group were delivered by caesarean section.[16]

We did not find statistically significant difference in SGA and NND between the two groups.This is in contrast with Gomathy et al where 91.6% foetuses were SGA in EOPE as compared to 54.8% in LOPE.(p0.0001).[16] Bozdag et al also found that more foetuses are SGA in EOPE group as compared to LOPE (p=0.001).[18] In addition, Bozdag et al found 30% neonatal deaths in preeclampsia before 34 weeks as compared to 4% afterwards (p=0.01).[18]

CONCLUSION

The study concludes that preterm birth and NICU admissions were more in EOPE while more mothers wioth LOPE were delivered through cesarean section. Difference of SGA and NND was however not statistically significant between the two groups.

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Author's Contribution

SG Conceived the idea, drafted the manuscript and did final corrections. WS executed the plan, did data collection and interpretation and refined the manuscript. Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Conflict of Interest

Authors declared no conflict of interest

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None

Data Sharing Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.