



The Differences of Characteristic, Management, Maternal and Perinatal Outcomes among Early and Late Onset Preeclampsia

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Abstract

Objectives: Preeclampsia (PE) is still a problem in the field of obstetrics. This is due to the unclear etiology, morbidity and mortality are still high. Currently, there has been a change in the definition and understanding of Preeclampsia, Early Onset Preeclampsia (EOPE) and Late Onset Preeclampsia (LOPE). EOPE is a disorder accompanied by severe complications for both the mother and the perinatal due to placental factors, while LOPE is a disorder that is characterized by a mild complications in maternal from maternal disorders. This study aims to find differences in characteristics, management, maternal and perinatal outcomes to EOPE and LOPE. **Methods:** An analytic observational study was done with cross sectional design involving retrospective data 433 pregnant women with preeclampsia who delivered in Hasan Sadikin Hospital Bandung. Data were taken from January 2013 to December 2014. It was noted the characteristics, management, maternal and perinatal outcomes. Data were analyzed using parametric and nonparametric test with significance $p < 0.05$. **Results:** The results showed that the incidence of EOPE (27.5%) was lower than LOPE (72.5%). Diastolic blood pressure is significantly higher in EOPE 109.71 ± 10.761 and 106.05 ± 8.871 compared to LOPE. The most spontaneous delivery is with EOPE labor (91.2%) while in LOPE delivery with using forceps (73.8%). Long of stay in EOPE at 5.59 ± 6.90 is longer than the LOPE at 5.32 ± 4.70 . Complications in perinatal outcomes such as low birth weight (<2500 gram) are more in EOPE (97.5%) compared to LOPE (45.6%) and asphyxia is more on EOPE (11.7%) compared to LOPE (1.3%). Stillbirth in EOPE (16%) is more than LOPE group (2.8%). **Conclusions:** It is obtained that EOPE incidence rate is lower than LOPE. Mother and perinatal complications are greater in the EOPE group.

Keywords

Early Onset Preeclampsia and Late Onset Preeclampsia, Management, Maternal and Perinatal Outcomes

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1. Introduction

Preeclampsia (PE) is a condition in which the blood pressure is increase with or without proteinuria and may occur with or without the complications of other organs [1]-[4]. Preeclampsia is still a problem in the field of obstetrics. The incidence of PE ranges from 3% - 5% of births. This is due to the unclear etiology, and morbidity and mortality are still high [5]-[8].

Currently there has been a change in the definition and understanding of Preeclampsia, known as Early Onset Preeclampsia (EOPE) and Late Onset Preeclampsia (LOPE). This division is based on gestational age at patients with impaired blood pressure. EOPE is a PE that occurred at the gestational age of less than 34 weeks (<34 weeks) and are usually accompanied by severe complications for both the mother and perinatal due to placental factors. While LOPE is a PE that occurred at the gestational age of 34 weeks (≥ 34 weeks), and the disorder is accompanied by mild complications derived from maternal abnormalities [11]-[16].

Complications that occur in EOPE can cause severe problems either occur in both mother and fetus with increased morbidity and mortality. The latest research reported that termination of pregnancy labor <34 weeks would be better in termination of better maternal dan perinatal outcomes [11] [12] [17].

This study aimed at determining the differences in characteristics, management, maternal and perinatal outcomes of EOPE and LOPE hospitalized in Hasan Sadikin Hospital Bandung during 2 years periode in 2013-2014.

2. Methods

Retrospective data of PE mother were obtained from medical records of Hasan Sadikin Hospital in Bandung for two years from 2013-2014. Data were analyzed based on inclusion and exclusion criteria in the form of a single pregnancy, which noted characteristics such as age, education, parity and systolic and diastolic blood pressure. Data that support for maternal outcomes include duration of treatment, mode of delivery, type of anesthesia. Data transform and outputs include birth weight baby and *apgar score* in the 5th minute [17]-[19].

Preeclampsia defined by *The International Society for the Study of Hypertension in Pregnancy (ISSP)* is an increase in systolic blood pressure ≥ 160 mmHg or diastolic ≥ 110 mmHg pregnancy after a gestation >20 weeks with or without maternal complications. PE differentiated by gestational age <34 weeks (EOPE) and gestational age ≥ 34 weeks (LOPE) [9] [10].

Statistic Analysis

Data were analyzed using parametric statistical tests and non-parametric. riteria significance is with $p < 0.05$.

3. Result

Based on data from medical records of Hasan Sadikin hospital in 2013-2014, it was obtained data with PE 489 patients. A total of 56 patients were excluded so that the data can be analyzed as many as 433 patients. From these data, a total of EOPE are 119 patients (27.5%) and 314 patients are LOPE (72.5%) (**Figure 1**).

Data Characteristic

This study was conducted to pregnant women with Preeclampsia as many as 433 person. A total of 279 (64.4%) deliveries occurred in the age range of 20 - 35 years. Education of PE patients is high school as 164 (37.9%). Based on the gestational age of PE, LOPE patients (≥ 34 minggu) were 314 (72.5%) more than EOPE (<34 minggu) 119 (27.5%). Patients with PE occurred at multigravida were 255 (58.9%). While the systolic blood pressure was on average 170.33 ± 14.43 and mean diastolic 107.06 ± 9.557 . Long of stay was over 3 days of 274 (63.3%) (**Table 1**).

Table 2 shows that the characteristics of the age and education are not significant in EOPE and LOPE group ($p < 0.05$). Multigravida was found more in EOPE, while primigravida was more in LOPE ($p < 0.05$). Not associated

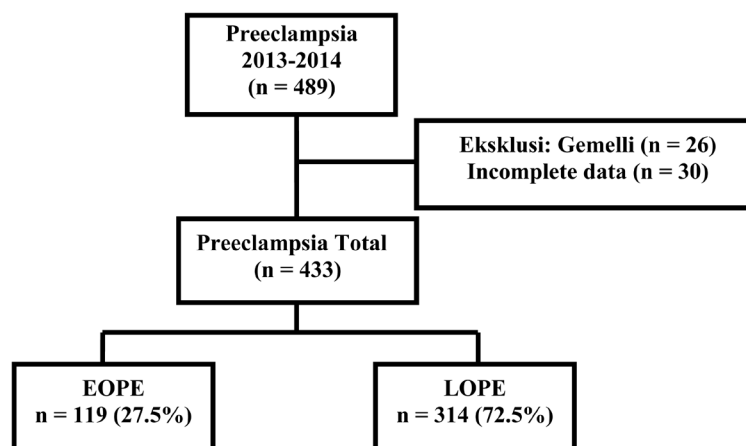


Figure 1. Patients with PE Hasan Sadikin Hospital in 2013-2014.

Table 1. Characteristic of patients with PE.

Variable	2013 (n = 217)	2014 (n = 216)
Age (years)		
<20	17 (7.8%)	33 (15.3%)
20 - 35	148 (68.2%)	131 (60.6%)
>35	52 (24.0%)	52 (24.1%)
Education		
Elementary	57 (26.3%)	47 (21.8%)
Middle School	60 (27.6%)	71 (32.9%)
High School	74 (34.1%)	90 (41.7%)
College	26 (12.0%)	8 (3.7%)
Gestational age (weeks)		
<34	60 (27.6%)	59 (27.3%)
≥34	157 (72.4%)	157 (72.7%)
Parity		
Primigravida	89 (41.0%)	89 (41.2%)
Multigravida	128 (59.0%)	127 (58.8%)
Blood Pressure (mmHg)		
Systolic		
Mean ± Std	170.36 ± 14.93	170.30 ± 13.95
Median	170.00	170.00
Range (min-max)	120.00 - 230.00	140.00 - 250.00
Diastolic		
Mean ± Std	107.08 ± 9.804	107.03 ± 9.325
Median	110.00	110.00
Range (min-max)	90.00 - 160.00	60.00 - 150.00

Note: For numeric data are presented with mean, standard deviation, median, and range (min-max). For categorical data are presented in proportions.

Table 2. Characteristic of patients EOPE and LOPE.

Variable	EOPE (n = 119)	LOPE (n = 314)	p
Age (years)			0.473
Mean ± Std	173.16 ± 17.90	169.26 ± 12.75	
Median	170.00	170.00	
Range (min-max)	140.00 - 250.00	120.00 - 230.00	
Education			1.000
Elementary	29 (24.4%)	75 (23.9%)	
Middle School	36 (30.3%)	95 (30.3%)	
High School	44 (37.0%)	120 (38.2%)	
College	10 (8.4%)	24 (7.6%)	
Parity			0.017**
Primigravida	64 (53.8%)	184 (58.6%)	
Multigravida	55 (46.2%)	130 (41.4%)	
Blood pressure (mmHg)			0.073
Systolic			
Mean ± Std	173.16 ± 17.90	169.26 ± 12.75	
Median	170.00	170.00	
Range (min-max)	140.00 - 250.00	120.00 - 230.00	
Diastolic			0.002**
Mean ± Std	109.71 ± 10.761	106.05 ± 8.871	
Median	110.00	110.00	
Range (min-max)	100.00 - 150.00	60.00 - 160.00	

Note: For numeric data *p* value was calculated based on the unpaired *t* test when the normal distribution of data as well as alternative *Mann Whitney test* if the data are not normally distributed. For categorical data and the *p*-value is calculated based on *Chi-Square test*. With the *Fisher Exact* alternative test if the requirements of the *Chi-Square* is not obtained. Significance score was based on the value of $p < 0.05$. Sign * indicates $p < 0.05$ means significance or statistically significant.

with an increase in systolic blood pressure were significant in both groups, but to an increase in diastolic blood pressure more on EOPE than LOPE ($p < 0.05$). EOPE was a longer treated group compared to LOPE ($p < 0.05$).

Table 3 illustrates the comparison of outcomes in patients EOPE and LOPE. Most deliveries performed by cesarean section, are respectively by 58% (EOPE) and 50.6% (LOPE). There is lots of spontaneous labor to EOPE group compared to LOPE ($p < 0.05$). Deliveries using forceps are more in LOPE groups than in EOPE ($p < 0.05$). General anesthesia is more in EOPE group (41.2%), while block anesthesia is more in LOPE group (20.4%).

In the assessment of outcomes (**Table 4**) showed that in the group of EOPE is more babies born weighing < 2500 g (97.5%) where as in the group LOPE is more weight infants ≥ 2500 grams (54.5%). Babies who are born in EOPE groups suffer asphyxia (11.7%) more than babies in LOPE group (1.3%). Stillbirth in EOPE group (16%) are more than in LOPE group (2.8%).

4. Discussion

Data were taken from the data of PE patients in Hasan Sadikin Hospital for 2 years in 2013 and 2014. This study was conducted to determine how much influence the occurrence of PE based on the characteristics of maternal gestational age, management, maternal and infant outcomes.

Table 3. Maternal outcomes of EOPE and LOPE.

Variable	EOPE (n = 119)	LOPE (n = 314)	p
Mode of Delivery			0.366
SC	64 (53.8%)	184 (58.6%)	
Vaginal	55 (46.2%)	130 (41.4%)	
Vaginal Delivery			0.0001**
Spontaneous	52 (91.2%)	31 (23.8%)	
Forceps	3 (5.3%)	96 (73.8%)	
Vacuum	0 (0.0%)	2 (1.6%)	
Embriotomi	2 (3.5%)	1 (0.8%)	
Anesthesia			0.680
General	49 (41.2%)	105 (33.4%)	
Block Anesthesia	11 (9.2%)	64 (20.4%)	
No Anesthesia (Vaginal)	59 (49.6%)	145 (46.2%)	
Long of Stay (days)			0.0001**
Mean ± Std	5.59 ± 6.90	5.32 ± 4.70	
Median	4.00	4.00	
Range (min-max)	1.00 - 92.00	1.00 - 35.00	

Note: For numeric data *p* value was calculated based on the unpaired *t* test when the normal distribution of data as well as alternative *Mann Whitney test* if the data are not normally distributed. For categorical data and the *p*-value is calculated based on *Chi-Square test*. With the *Fisher Exact* alternative test if the requirements of the *Chi-Square* is not obtained. Significance score was based on the value of $p < 0.05$. Sign * indicates $p < 0.05$ means significance or statistically significant.

Table 4. Perinatal outcomes of EOPE and LOPE.

Variable	EOPE (n = 119)	LOPE (n = 314)	p
Birth Weight (grams)			0.0001**
<000	107 (89.9%)	47 (15.0%)	
2000 - 2499	9 (7.6%)	96 (30.6%)	
≥2500	3 (2.5%)	171 (54.5%)	
Apgar Score (minute 5)			0.0001**
Asphyxia (≤3)	14 (11.7%)	4 (1.3%)	
Not Asphyxia (>3)	86 (72.3%)	301 (95.9%)	
Stillbirth	19 (16.0%)	9 (2.8%)	

Note: For categorical data the *p*-value is calculated based on *Chi-square test* with *Fisher Exact* alternative test and *Kolmogorov Smirnov* if the requirements of the *Chi-Square* is not obtained. Significance score is based on the value of $p < 0.05$. Sign * indicates $p < 0.05$ means significance or statistically significant.

The study group was divided into 2 occurred PE based on gestational age. EOPE is PE with a gestational age less than 34 weeks (<34 minggu) while LOPE is PE with gestational age greater than or equal to 34 weeks (≥34). Complications in EOPE are heavier than LOPE due to placental factors and occurs in pregnancy <34 minggu [18]. EOPE complications occur in women including increased blood pressure both systolic and diastolic thus require longer treatment than LOPE. Babies born from EOPE mother get more in trouble. Babies who are born in EOPE

groups suffer asphyxia and low birth weight more than babies in LOPE group [19]-[21]. In this study, increased blood pressure only in diastolic that significant.

In this study, the EOPE is only by 27.5% lower compared with LOPE is 72.5% [17]. Data from Pettit study incidence EOPE is 13% [22].

The mode of delivery either on EOPE or LOPE is done caesarean section. Different from Pettit et al study, caesarean section is more in EOPE group (70%) compares LOPE group (40%) [22]. However the vaginal delivery in EOPE is lot to do with the spontaneous process by induction of labor. This is possible because of babies born weighing less than normal. In LOPE, vaginal delivery is done by using the aid of either with forceps [17].

Perinatal outcomes in EOPE patients are more likely to endurance lower due to be born with lower birth weight and the possibility of breathing difficulties (asphyxia) is greater than the LOPE patients [22]-[24].

Infants of mothers with EOPE, in particular those born at <34 weeks, had increased perinatal morbidity and mortality compared to infants from ≥ 34 weeks [21].

A recent review by Sibai supported expectant management in selected cases of severe PE presenting before 34 weeks [20] [21] [25]. Good perinatal outcomes were reported in centre equipped to management high-risk pregnancies and premature neonatus. The provision of MgSO₄ 40% as a brain protector and corticosteroids to infant lung maturation can reduce complications of peronatal outcomes. Hall reported no increased in maternal complications when women who presented before <34 weeks were managed expectantly. The caesarean section rates were high at 82% and women were delivered once they reached 34 weeks gestation [12] [25].

5. Conclusions

- 1) The incidence of EOPE is lower (27.5%) than LOPE (72.5%).
- 2) EOPE group experienced more complications for both the fetus and the mother.
- 3) Diastolic blood pressure is higher in EOPE than LOPE.
- 4) Spontaneous delivery more in EOPE, while LOPE ends with action by using forceps.
- 5) EOPE long of stay in hospital is longer than LOPE.
- 6) Low birth weight (<2500 gram) with asphyxia is more on EOPE.
- 7) Stillbirth EOPE is more than LOPE group.

6. Suggestions

Because EOPE has the maternal characteristics with the mother and infant outcomes that are worse than LOPE so the management requires special attention by doing something more active, including the provision of MgSO₄ 40% as a brain protector and corticosteroids to infant lung maturation prior to termination of pregnancy.

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