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## A clinical study of early onset pre-eclampsia v/s late onset pre-eclampsia

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### Abstract

**Introduction:** Preeclampsia is a multi-system disorder of unknown etiology that is unique to human pregnancy and is characterized by abnormal vascular response to placentation associated with increased systematic vascular resistance (SVR), enhanced platelet aggregation, activation of coagulation system and endothelial dysfunction. It remains a major cause of maternal and fetal/neonatal morbidity and mortality. **Methodology:** As per case record form thorough clinical examination including BP, edema, pallor etc was done. Detailed obstetric examination was done in the form of obstetric palpation, presentation, amount of liquor and fetal heart sounds. All the women were investigated (routine and specific for PE), managed according to the hospital protocol, followed up till delivery and maternal and perinatal outcomes were noted. The women once diagnosed as PE they were hospitalized, investigated for PE and they were managed with antihypertensive as per hospital protocol.

**Results:** Mean gestational age in the group 1 was  $27.88 \pm 4.03374$  weeks and mean gestational age in the group 2 was  $38.68 \pm 1.98402$  weeks. Mean gestational age of overall study subjects was  $33.28 \pm 6.28141$  weeks. The association between the two groups was non significant.

**Conclusion:** Family history of PE was noted in 11 out of 100 women in the study and it was noted in 63.6% in early onset preeclampsia group (Group1) as compared to 36.4% in late onset preeclampsia (Group2).

**Keywords:** preeclampsia, early onset, platelet count

### Introduction

Preeclampsia is a pregnancy specific disorder commonly defined as de novo hypertension and proteinuria after 20 weeks of gestational age. It occurs in approximately 3-5% of pregnancies and is still a major cause of both fetal and maternal morbidity and mortality world-wide<sup>[1]</sup>.

Preeclampsia is a multi-system disorder of unknown etiology that is unique to human pregnancy and is characterized by abnormal vascular response to placentation associated with increased systematic vascular resistance (SVR), enhanced platelet aggregation, activation of coagulation system and endothelial dysfunction. It remains a major cause of maternal and fetal/neonatal morbidity and mortality. Every third case of obstetric morbidity and more than 50,000 maternal deaths a year world-wide are caused by preeclampsia. Leading maternal symptoms are hypertension and proteinuria. Additionally the central nervous system, liver, kidney, and coagulation system can be affected. The rate of fetal complication depends mostly on gestational age at the time of delivery. Fetal morbidity is caused by intra uterine growth restriction (IUGR), small for gestational Age (SGA), placental abruption and pre-term births. The incidence of perinatal and neonatal deaths is increased as well. Early onset PE (<34 weeks of gestation) is more often accompanied with a high complication rate and with severe consequences of preterm deliveries compared to the late onset form of disease<sup>[2, 3]</sup>.

Hypertensive disorders of pregnancy complicate about 8% of all gestation and are responsible for significant maternal and perinatal morbidity and mortality. The classification of hypertensive disorders by the working group of the National High Blood Pressure Education Program (NHBPEP 2000) is as follows.

There are four types of Hypertensive disease.

1. Gestational Hypertension
2. Preeclampsia and Eclampsia
3. Preeclampsia superimposed on chronic hypertension
4. Chronic hypertension

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Preeclampsia is a common pregnancy specific syndrome that originates in placenta and is associated with fetal risks (growth restriction, prematurity, death) and maternal risks (cerebrovascular, cardiac, hepatic and renal complications), while hypertension without proteinuria generally has a far more benign course<sup>4</sup>. It develops after 20 weeks of gestation and resolves after delivery of placenta<sup>5</sup>.

Preeclampsia is defined as hypertension associated with proteinuria, greater than 0.3 g/L in a 24 hour urine collection or 1 + by qualitative urine examination after 20 weeks of gestation. Mild preeclampsia is defined as diastolic blood pressure less than 110mm Hg and systolic blood pressure less than 160mm of Hg and severe preeclampsia is defined as systolic blood pressure of 160mm of Hg or more and diastolic blood pressure of 110 mm of Hg or more<sup>6</sup>.

It affects 3-5% of all pregnancies. In India there is 5-15% incidence of preeclampsia. It causes 10-15% maternal deaths in the developing countries<sup>6</sup>. The reasons for increased maternal mortality and morbidity in developing countries are social deprivation, lack of access to trained birth attendants, lack of education, late referral to tertiary care centers, lack of transport, unbooked status of the patient, nulliparity, prolonged state of unconsciousness, and multiple seizures prior to admission<sup>7</sup>.

### Methodology

A total 100 women satisfying inclusion and exclusion criteria were included in the study and they were grouped into two groups as per their gestational age.

**Group 1:** 50 pregnant women with preeclampsia remote from term with gestational age between 20-34 weeks of gestation. (Early onset PE)

**Group 2:** 50 pregnant women with preeclampsia near term with gestational age between 35-42 weeks of gestation. (Late onset PE).

### Inclusion criteria

1. Patients booked in the first trimester with known first trimester BP record.
2. Pregnant women between 20-42 weeks of gestation.
3. Blood pressure  $\geq 140$ mm of Hg systolic and  $\geq 90$ mm of Hg diastolic with proteinuria: diagnostic of preeclampsia.
4. Singleton pregnancy

5. Women with good dates/ or having early USG/clinical examination details
6. Women willing to deliver in this hospital

### Exclusion criteria

1. Gestational age <20 weeks or > 42 weeks
2. Multifetal gestation
3. Women who are neither sure of their dates nor having early USG
4. Known case of essential hypertension
5. Known case of renal disease
6. Gestational hypertension
7. Presence of diabetes mellitus
8. Heart disease

Women in both the groups were studied for demographic data such as age, gravity, family history and severity of preeclampsia. As per case record form thorough clinical examination including BP, edema, pallor etc was done. Detailed obstetric examination was done in the form of obstetric palpation, presentation, amount of liquor and fetal heart sounds. All the women were investigated (Routine and specific for PE), managed according to the hospital protocol, followed up till delivery and maternal and perinatal outcomes were noted. The women once diagnosed as PE they were hospitalized, investigated for PE and they were managed with antihypertensive as per hospital protocol. They were followed up with BP record, investigations and clinical examination. The worsening of disease was the indication for termination of pregnancy. Maternal outcome was noted in terms of severity of PE, maternal complications like Abruptio placetae, HELLP syndrome, eclampsia, DIC, ARF, pulmonary edema and maternal mortality. The perinatal outcome was noted in the form of birth weight, IUGR, birth asphyxia, NICU admission and perinatal mortality. The platelet count, liver enzymes and serum uric acid levels in both the groups were studied and compared. Maternal and perinatal outcome in these women with Preeclampsia remote from term i.e. early onset PE (Group 1-20-34 weeks of gestation) in a tertiary care hospital were studied and were compared with Preeclampsia near term i.e. late onset PE (Group 2-35-42 weeks of gestation) and the outcome of 100 women with PE was analyzed.

### Results

**Table No1:** Distribution of number of women into two groups

Group	Study Group	No. of women	Percentage (%)
Group 1	PE remote from term or early onset PE (20-34 weeks of gestation)	50	50%
Group 2	PE near term or late onset PE (35-42 weeks of gestation)	50	50%
Total Number of women		100	100%

Table 1 shows that total of 100 women with preeclampsia were included in study and were distributed into two groups.

Group 1: 50 women with preeclampsia remote from term or

early onset PE i.e. 20 to 34 weeks of gestation

Group 2: 50 women with preeclampsia near term or late onset PE i.e. 35 to 42 weeks of gestation

**Table 2:** Association of subjects according to age between two groups

	Age	No. of women (%)				Total (%)
		Group1		Group2		
	18-25	29	(51.8%)	27	(48.2%)	56 (100%)
	26-30	14	(46.7%)	16	(53.3%)	30 (100%)
	31-35	4 (44.4%)		5 (55.6%)		9 (100%)
	>35	3 (60%)		2 (40%)		5 (100%)
	Total	50	(50%)	50	(50%)	100 (100%)
	Mean + S.D.	25.38 ± 4.72894		25.04 ± 4.7722		25.21 ± 4.72965

Chi square test value	0.5159		
'p' value	0.915391 – NON SIGNIFICANT		

Table 2 shows the association of subjects according to age between two groups. In the age group of 18-25 years total subjects were 56, in between 26-30years, 31-35 years there were 30 & 9 subjects respectively whereas in the age group >35 years there were 5 subjects.

The mean age in group 1 was  $25.38 \pm 4.72894$  years & mean age in group 2 was  $25.04 \pm 4.7722$  years. Mean age of overall study subjects was  $25.21 \pm 4.72965$  years. The association between the two groups was non significant.

**Table 3:** Association of subjects according to gestational age at the time of diagnosis of preeclampsia between the groups

		No. of women (%)		Total (%)
		Group1	Group2	
Gestational Age at the time of Diagnosis of preeclampsia	20-24	13	(100%)	13 (100%)
	25-28	14	(100%)	14 (100%)
	29-34	23	(100%)	23 (100%)
	35-37	16	(100%)	16 (100%)
	38-40	22	(100%)	22 (100%)
	41-42	12	(100%)	12 (100%)
Total		50(50%)	50 (50%)	100 (100%)
Mean + S.D.		27.88 $\pm$ 4.03374	38.68 $\pm$ 1.98402	33.28 $\pm$ 6.28141
Chi square test value		100		
'p' value		< 0.00001		

Table 3 shows the association of subjects according to gestational age at the time of diagnosis of preeclampsia between the groups. Mean gestational age in the group 1 was  $27.88 \pm 4.03374$  weeks and mean gestational age in the group 2 was  $38.68 \pm 1.98402$  weeks. Mean gestational age of overall study subjects was  $33.28 \pm 6.28141$  weeks. The association between the two groups was non significant.

**Table 4:** Association of subjects according to gravidity

		No. of women (%)		Total (%)
		Group1	Group2	
Gravidity	Multigraviade	24 (48%)	26 (52%)	50 (100%)
	Primigraviade	26 (52%)	24 (48%)	50 (100%)
Total		50 (50%)	50 (50%)	100 (100%)
Chi Square test value		0.16		
'p' value		0.689157 Non Significant		

**Table 5:** Association of subjects according to severity of preeclampsia between Groups

		No. of women (%)		Total (%)
		Group1	Group2	
Severity of PE	Mild	23(42.6%)	31(57.4%)	54 (100%)
	Severe	27(58.7%)	19(41.3%)	46 (100%)
Total		50(50%)	50(50%)	100 (100%)
Chi Square test value		2.5765		
'p' value		0.108462 Non significant		

Table 6 shows association of severity of preeclampsia between two groups. Total 54% women had mild and 46% had severe PE. Severe PE was more noted in group 1 when compared with group 2. 46% women in group 1 had mild PE and 54% had severe PE whereas in group 2, 62% had mild PE and 38% had severe PE. This difference was statistically not significant.

**Table 6:** Association of subjects according to platelet count values between two groups

		No. of women (%)		Total (%)
		Group1	Group2	
Platelet count (lakhs/ 3 mm)	<1	13	(68.4%)	6 (31.6%)
	1-1.5	14	(66.7%)	7 (33.3%)
	1.6-2	8	(42.1%)	11 (57.9%)
	>2	15	(36.6%)	26 (63.4%)
Total		50	(50%)	50 (50%)
Chi Square test value		8.3372		
P Value		0.039534 Significant		

Table 7 shows association of platelet count between two groups. In group 1 platelet count was significantly low. In group 1, 66.7% had platelet count  $\leq 1.5$  lakh/mm<sup>3</sup> and 68.4% had platelet count  $\leq 1$  lakh /mm<sup>3</sup>. The difference between the platelet counts in both the two groups was statistically significant.

## Discussion

Preeclampsia is common pregnancy specific syndrome that originates in placenta and is associated with fetal risks (growth restriction, prematurity, death) and maternal risks (Cerebrovascular, cardiac, hepatic and renal complications), while hypertension without proteinuria generally has a far more

benign course<sup>[6]</sup>. It usually develops after 20 weeks of gestation and resolves after delivery of placenta. It remains a major cause of maternal and fetal/neonatal morbidity and mortality. Every third case of obstetric morbidity and more than 50,000 maternal deaths a year world-wide are caused by Preeclampsia. The rate of fetal complications depends mostly on gestational age at the time of delivery. Fetal morbidity is caused by intra uterine growth restriction (IUGR). Small for gestational age (SGA), placenta abruption and pre-term births. The incidence of perinatal and neonatal deaths is increased as well. Preeclampsia remote from term i.e. early onset PE (<34 weeks of gestation) is more often accompanied with a high complication rate and with

severe consequences of preterm deliveries compared to the late onset form of disease<sup>[7]</sup>.

In a study carried out by Peter Von Dadelszen *et al.*,<sup>[8]</sup> in 2009 for Preeclampsia integrated estimated risk study in 2009, at the department of obstetrics and gynecology, university of Colombo, Vancouver, Canada it was observed that the mean age in preeclampsia was 26.6±5.6 yrs of age.

In a study conducted by Rathore R, Butt *et al.*,<sup>[9]</sup> at king Edward Medical University, Mayo hospital, Lahore in 2010 mean age in women with PE was 28.2 ±5.2yrs.

Vithahal Kuchake *et al.*,<sup>[10]</sup> conducted a study in 2010 at department of clinical pharmacy, R.C. Patel institute of pharmaceutical education and research, Shripur, Dhule, India, the mean age was observed as 25.5 ±2.4 yrs.

Tavassoli Fatemeh *et al.*<sup>[11]</sup> conducted a study on maternal and perinatal outcome in women with pregnancy hypertension at department of obstetrics and gynecology, Imman Reza hospital, Mashhad university, Iran, the mean age noted was 22.4 ± 4.62 yrs.

In the present study mean age of group 1 was 25.38 ± 4.72894 years & mean age in group 2 was 25.04 ± 4.7722 years.

In a study conducted by Mandana Saadat *et al.*,<sup>[12]</sup> in dept of Obstetrics and Gynecology, Bandarabbas university of medical sciences, Tehran, Iran in 2005-2006 where 1235 patients with PE were studied, they found that multigravidae (65.6%) were more common than primigravidae(34.4%)

In a study conducted by S.Kishwara *et al.*,<sup>[6]</sup> in Dhaka Medical college in 2005-2006 where 30 women with PE were studied, it was observed that PE was more common in Primigravidae (63.33%) than in multigravidae (36.71%).

In a study conducted by Rathore R, Butt NF *et al.*,<sup>[9]</sup> at king Edward medical university Lahore in 2007-2008 regarding complications and outcome of preeclampsia and eclampsia where 100 patients were studied they observed that the PE was more common in Primigravidae (60%) than in multigravidae (40%).

In another study conducted by Peter Von Dadelszen *et al.* in the department of Obstetrics and Gynaecology, University of British Columbia, Vancouver, Canada in 2009 regarding predicting adverse outcome in women with severe PE, PE was observed in 33% of primigravidae and 67% of multigravidas.

Vitthal Kuchake *et al.*,<sup>[10]</sup> studied maternal and neonatal outcomes in PE in 2010 at department of clinical pharmacy, R.C. Patel institute of pharmaceutical education and research, Shripur, Dhule, India, PE was observed in 58.90% of primigravidae and 41.10% of multigravidae women.

In the present study Group 1 has 52% primigravidae and 48% multigravidae whereas Group 2 has 48% primigravidae and 52% multigravidae.

In a study conducted by S. Kishwara *et al.*,<sup>[6]</sup> Dhaka Medical College in 2005-2006 where the mean gestational age of the mother was 36.90± 1.03 in preeclampsia group as compared to 38.27 ± 1.26 weeks in control group giving the 'p' value <0.001 which was statistically significant.

In a study conducted by Tavassoli Fatemeh *et al.* in Dept. of Obstetrics and Gynecology, Masshad university, Tehran, Iran they observed that the gestational age was significantly lower in PE group (37.37±2.25) as compared to control i.e.(38.81±1.71) giving the 'p' value less than 0.001.

In the present study mean gestational age in the group 1 was 27.88 ± 4.03374 weeks and mean gestational age in the group 2 was 38.68 ± 1.98402 weeks.

In another study done by Tavassoli Fatemeh *et al.*,<sup>[11]</sup> at department of OBGYN, Masshad university, Iran in 2008 where

100 patients of PE were studied they observed Mild PE in 51% cases and severe PE in 49% cases.

In a study conducted by Vitthal Kuchake *et al.*<sup>[10]</sup> in 2010 at department of clinical pharmacy at R.C. Patel institute of Pharmaceutical education & research where 73 patients with PE were studied, 87.67% were having mild form of PE and 12.33% having severe form of the disease.

In the present study 46% women in group 1 had mild PE and 54% had severe PE whereas in group 2, 62% had mild PE and 38% had severe PE

## Conclusion

- Primigravidae were more in the early onset preeclampsia group (Group 1) as compared to late onset PE group (Group 2)
- Mean gestational age in the group 1 was 27.88 ± 4.03374 weeks and mean gestational age in the group 2 was 38.68 ± 1.98402 weeks.

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