

## A STUDY ON MATERNAL AND PERINATAL OUTCOME IN ANTENATAL WOMEN WITH EARLY ONSET PREECLAMPSIA ATTENDING TERTIARY CARE HOSPITAL

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### Abstract

**Background:** Pre-eclampsia has a prevalence rate of 2.3%. 50% of the women with severe pre-eclampsia present at less than 34 weeks of gestation. Delivery is mandatory either for maternal or fetal reasons within 24 hours of admission. The objective is to study the maternal and fetal outcome in early onset preeclampsia between 26 – 34 weeks in antenatal women. **Materials and Methods:** Prospective Analytical Study was conducted among 150 patients with pregnancies having early onset preeclampsia at Nilofer hospital for women and children Red Hill Hyderabad Telangana for a period of 18 MONTHS (2020-2022). **Result:** The foetal outcome was unaffected by the delivery method, although the caesarean rate was higher, accounting for roughly 69% of births. Complications were experienced by 58 (38.5%) women. The greatest rates of abruption and eclampsia were 17 (11.3%) and 14 (9.3%), respectively. 6 (4%) maternal deaths occurred. HELLP/DIC (2), AP Eclampsia with hypertensive failure (1), AP Eclampsia with ARF (1), pulmonary oedema (1), and Abruption with DIC were the causes of maternal death (1). The majority of the female patients needed to stay in the hospital for 2 to 3 weeks, with a minimum of 7 days and a maximum of 31 days. A postpartum woman typically spent 16 days in the hospital. In most cases, prolonged hospitalisation was done for the benefit of the baby. **Conclusion:** Preeclampsia with an early onset is associated with serious problems for both the mother and the foetus. For improved maternal and foetal outcomes, early booking is crucial. A pregnancy termination decision must be made based on both maternal and foetal considerations. In cases of severe, uncontrolled blood pressure with complications, termination should be performed regardless of foetal maturity.

## INTRODUCTION

Preeclampsia is a multisystem condition that only develops during pregnancy and affects the placenta, kidney, liver, blood, cardiovascular, and neurovascular systems. Its cause is unknown.

Preeclampsia is defined as a new-onset increase in blood pressure and proteinuria that happens after 20 weeks of pregnancy. If there is a significant rise in blood pressure, proteinuria, or the emergence of symptoms related to end organ damage, it is referred to as severe preeclampsia. If proteinuria and an increase in blood pressure start before 34 weeks of pregnancy, it is said to have an early onset preeclampsia. Over 17% of maternal deaths are attributable to hypertension and its consequences, which is the third most common cause of maternal

mortality.<sup>[1-3]</sup> Women continue to die from pre-eclampsia and eclampsia even in affluent nations.

There is higher risk of acute renal failure, heart and brain problems, placental abruption, disseminated intravascular coagulation, and even maternal death exists.<sup>[1]</sup>

During the perinatal period There is a progressive decline in the mother's health and high mortality in the foetus in cases of early-onset severe preeclampsia.<sup>[2,3]</sup> All of these complications are thought to be avoidable solely by delivering the foetus. Therefore, it is necessary to end the pregnancy if there is foetal discomfort, if many organs are dysfunctional, or if the gestational age surpasses 34 weeks. However, premature birth brought on by early termination results in substantial perinatal morbidity and mortality.<sup>[1,4-6]</sup> Although

foetal lung development does not occur, expectant care to extend pregnancy can be harmful to the mother.<sup>[7,9]</sup> Therefore, possible advantages for the foetus should be balanced against potential risks to the mother.

## MATERIALS AND METHODS

Prospective Analytical Study was conducted among 150 patients with pregnancies having early onset preeclampsia at Nilofar hospital for women and children Red Hill Hyderabad Telangana for a period of 18 months (2020-2022).

### Inclusion Criteria

- Gestational age  $\geq 26$  weeks and  $< 34$  weeks
- Diastolic BP  $\geq 90$  mmHg
- Systolic bp  $\geq 140$  mmHg
- Proteinuria  $> 1$  mg/dl

### Exclusion Criteria

- Pregnant women with thyroid disorders.
- Pregnant women with heart disease.
- Pregnant women with APLA, Thrombophilia, SLE.
- Pre-existing chronic renal and hepatic diseases
- Idiopathic hemolytic anemia.
- Idiopathic thrombocytopenic purpura
- Epilepsy
- Pregnant women with secondary causes of hypertension

### Methodology

- All patients who meet the above mentioned criteria are included in the study and patients are admitted.
- Patient's detailed history, symptoms and signs of preeclampsia, imminent eclampsia if any is to be noted.
- General and Obstetric examination to be carried out.
- Urine investigation and PIH profile to be done on admission and repeated based upon the progression of the disease. Obstetric ultrasound with fetal doppler will be performed in patients on expectant management.
- In case of any abnormalities like Doppler changes, oligohydromnios and IUGR then expectant management to be discontinued and planned for termination.
- Details regarding treatment (Antihypertensives, Mgso4, steroids) to be noted.
- Details regarding mode of termination and indication for termination, Intraoperative, postpartum complications to be noted. Neonatal assessment has to be done by following the babies in the NICU.
- Maternal complications to be noted.
- Follow up of mother and neonate to be done upto discharge / death.
- Data to be collected, tabulated and statistical analysis to be performed

## RESULTS

Most of the women were in age group 21 – 30 (60%). Mean age group was 26 Yrs, with a range of 17 yrs - 40 yrs. In our study most of the patients were primi, n=99 (66%) Out of 150 patients 40 (27%) were booked and 110 (73%) were unbooked. Most of the women, in the study belonged to social economic class IV and V.

This table includes gestational age at which the patient first fulfilled the inclusion criteria for preeclampsia. Most of women n = 76 (50.7%) were in 32 – 34 weeks Mean gestational age at diagnosis was 31 weeks with a range of 25 to 34 weeks.

Most patients underwent termination of pregnancy after 32 weeks 84(56%) Mean gestational age at the time of delivery was 32 weeks

Out of 150 patients, 104 (69.3%) women received MgSO<sub>4</sub>, out of which 4 developed seizures and 3 of them had Postpartum eclampsia. 46 (30.7%) women did not receive MgSO<sub>4</sub>, out of which 11 (23.4%) developed seizure. MgSO<sub>4</sub> was given in view of imminent symptoms and signs. In 26 cases MgSO<sub>4</sub> was given in view of high BP without imminent symptoms.

In this study All patients received oral antihypertensive Nifedipine or Labetalol with Nifedipine 33 women (22%) required parenteral anti hypertensive (Labetalol or Nitroglycerine) for control of blood pressure. Out of 150 of oral woman 72(48%) were antihypertensive before admission

In this study Maternal indication was found to be the most common cause for termination of pregnancy, 128 (85.3%) most common cause being imminent eclampsia Most common fetal indication was Doppler changes.

Out of 150 patients, 69 (46%) were induced. Out of 69 patients who were induced, 46 (30.7 %) delivered vaginally and 23 (15.3%) underwent caesarean section. Out of 25 IUFDs, 9 were delivered by caesarean section indication being Abruptio for 7 and eclampsia for 2 patients. 81(54%) patients were not induced and underwent direct caesarean section. and The causes were Imminent eclampsia, eclampsia, Abruptio, Doppler changes, severe oligohydromnios. Overall, total number of patients who underwent LSCS were, 104(69 %), between 24-28 weeks 6 caesarean section was conducted in view of previous caesarean section.

Out of 150 patients in this study 32(21.3%) patients underwent expectant management and Maximum prolongation of pregnancy was 25 days, minimum of 2 days.

Out of 32 patients, 27(87.4%) patients had a prolongation of pregnancy  $\leq 10$  days. Maximum prolongation was 25 days. Mean number of days gained was 7 days with a range of 1-25 days in this study.

58 (38.6%) women experienced complications. Eclampsia and abruptio were highest accounting to 17(11.3%) and 14(9.3%) respectively. There were 6

(4%) maternal death in this study we found that all the six maternal death were between the gestational age of 30 to 34 weeks.

In this study Out of the total 150 babies, 90(60%) babies had complication. Out of 90 babies 25(16.6%) were IUFDs, majority were in women who were referred as IUFDs. Cause of IUFD being abruption in majority of cases. 121 babies were born alive. All were preterm. Major cause for neonatal morbidity and mortality were prematurity and Respiratory distress syndrome. Out of 21 babies who had RDS, 13(62%) did not receive steroids and 8(38%) received steroids. Neonatal ICU admission were needed in 90% of babies. Neonatal deaths were 16(10.6%) PN Mortality and Morbidity

Total no of babies 150 No of live babies 121 No of IUFDs 25

No of Stillbirth 4

No of Neonatal death 16

Out of 121 babies (excluding 25 IUFDs and 4 stillborn), 71 (47.3%) babies had apgar of 5-7 Apgar was found to be improving with increasing gestational age, which was statistically significant with P value < 0.002

Low birth weight, defined as 1.5-2.5kg was seen in 65 (43.3%) cases very low birth weight 1-1.5Kg was seen in 53 (35.3%) extreme low birth weight <1kg

was seen in 17 (11.3%) cases and the Mean birth weight was 1.43kg with a range of 500 grms to 2300 grms. IUGR was seen in 23(19.1%) babies.

In our study there is rapid fall in death rate and perinatal morbidity as birth weight increases. PND was 100% in birth weight <1 kg whereas there was no perinatal death in birth weight >2 kg. p value is <0.001 statistically significant. There was a positive correlation between birth weight and outcome.

Out of 32 patients who had expectant management there was 9(28.1%) and 2(6.2%) fetal morbidity and mortality respectively and we found there were no still birth. Two neonatal death occurred in patient who were delivered at 29 weeks.

Out of 32 patients who had expectant management there were no maternal death, 4(12.5%) patients had complications and all patients were delivered by caesarean section.

In majority of the patients BP control was achieved within a week. Only 7 patients were discharged with antihypertensives.

Most of the women required hospitalisation for 2 to 3 weeks with a minimum of 7 days and a maximum of 31 days. Mean of postpartum hospital stay was 16 days. Prolonged hospitalisation in most of the women was for baby sake.

**Table 1: Mode of Delivery**

Ga at delivery	Vaginal	Caesarean	Total
24-28	7	6	13
28-32	19	32	51
32-34	20	64	84
>34	0	2	2
Total	46	104	150

**Table 2: Expectant Management**

GA at diagnosis	Number of patients	Expectant management	
		Number of patients	Percentage
24-28	21	8	38.1
28-32	53	9	16.9
32-34	76	15	19.7
Total	150	32	21.3

**Table 3: Maternal Outcome**

Maternal outcome	Number of patients	Percentage
Eclampsia	17	11.3
Abruption	14	9.3
Wound Infection	8	5.3
Death	6	4
Post-partum eclampsia	3	2
HELLP	3	2
DIC	3	2
ARF	2	1.3
Atonic PPH	2	1.3
Total	58	38.6

**Table 4: Maternal Death**

Causes of maternal death	Number of patients
HELLP / DIC	2
AP Eclampsia with hypertensive failure	1
AP Eclampsia with ARF	1
Severe preeclampsia with pulmonary edema	1
Abruption with DIC	1
Total	6

**Table 5: Fetal Outcome**

Fetal outcome	Number of babies	Percentage
IUFD	25	27.8
IUGR	15	16.6
Death	16	17.8
RDS	13	14.4
HIE	2	1.3
RDS +HIE	9	10
SEPTICEMIA	6	6.7
STILLBORN	4	4.5
Total	90	100

**Table 6: Birth Weight (vs) Fetal Outcome (Excluding 25IUFDs)**

Birth Weight(Grams)	RDS		PND		ALIVE	
	NO	%	NO	%	NO	%
500-999			7	100		
1000-1499	15	35.7	10	23.8	32	76.1
1500-1999	10	16.3	3	4.9	58	95
>2000	-		-		14	93.3

**Table 7: expectant management (vs) fetal outcome**

Prolongation of pregnancy (days)	Fetal morbidity		Fetal mortality	
	NO	%	NO	%
1-10(27)	7	25.9	1	3.7
11-20 (3)	2	66.9	1	33.3
>20 (2)	-	-	-	-
Total (32)	9	28.1	2	6.2

**Table 8: expectant management (vs) maternal outcome**

Maternal complications	Number of patients
Eclampsia	1
HELLP	1
ARF	1
PP Eclampsia	1

## DISCUSSION

Our hospital being tertiary care centre, there were increased prevalence of cases, to have better understanding over the topic, sample size was increased from 100 to 150.

60 (60%) of the study group's participants were between the ages of 21 and 30, which is consistent with Moodley studies,<sup>[10]</sup> in which the average age was 26 years. The mean age was 26 years in investigations conducted by Brown MA and Buddle ML.<sup>[11]</sup> The average age in our study was 26 years.

First pregnancies frequently result in preeclampsia. 99 (66% of the study's female participants) were nulliparous. According to Pr Brown MA and Buddle ML<sup>[11]</sup>, preeclampsia is more common in nulliparous women.

Only 43 (28.6%) of the women in this study group exhibited risk factors, such as past gestational hypertension and a family history of hypertension. 36% of the women in the D.R. Hall study's had risk factors.<sup>[12]</sup>

In this survey, over 40 (27%) of the ladies were booked at our facility. 110 (73%) were scheduled elsewhere and directed to our hospital. Prevalence of unbooked appears to be higher, reason being, in our hospital minimum 4 visits is must to consider as booked case and cases booked outside our hospital is considered as unbooked.

Early detection and appropriate management of the problems are made possible by adequate prenatal care.

Despite the fact that the majority of the study's participants were scheduled, early diagnosis of prenatal hypertension was not achieved because to the women's lack of awareness and the fact that one or two records of high blood pressure at an early gestational age were not treated seriously.

The majority of the women, 85 (56.7%), and 64 (42.6%), respectively, belonged to socioeconomic classes IV and V.

An sign of the severity of preeclampsia is a platelet count of less than 100,000/mm<sup>3</sup>.<sup>[13,14]</sup> 15.3% of the female participants in this study had low platelet counts. Because of an increase in consumption and destruction within the vessel lumen, platelet count is lowered.<sup>[15]</sup>

Thirty patients (20%) exhibited abnormal renal functions, and eleven (7.3%) had altered coagulation profiles. Fundal changes of grade I and grade II were found in 33 (22%) of patients in which Grade I and Grade II were 22(14.7%) and 11(7.3) respectively. Pregnancy termination was not indicated by ophthalmological symptoms such as papilledema or retinal detachment.

Maternal mortality and seizure risk are both decreased by magnesium sulphate.<sup>[16]</sup> In our study, only 69.3% of patients with severe preeclampsia

received magnesium sulphate, which is low when compared to other studies.<sup>[16,17]</sup>

97% of the patients in a study by Lee WO' Connell CM and Baskett received magnesium sulphate.<sup>[17]</sup>

When given to patients with severe preeclampsia, magnesium sulphate reduces the likelihood of seizures by 58%.

Routine prophylaxis in patients with severe preeclampsia, however, is debatable, and the choice of treatment depends on whether it will be conservative or immediate termination.

In this trial, all patients took either labetalol and nifedipine as oral hypertensives.

In addition to oral antihypertensives, 33 (22%) patients needed parenteral antihypertensives.

The majority of the patients, 84 (56%) underwent pregnancy termination between 32 and 34 weeks.

The GA at the time of birth was determined to be 32–34 weeks in the D.R. Hall,<sup>[12]</sup> study. With longer gestation periods, apgar was found to be improving.

Early gestational age was shown to have a significant rate of foetal morbidity and mortality; perinatal death was 38.4% at 24–28 weeks and 6% at 32–34 weeks. RDS was high between 24–28 compared to 28–32 weeks, with rates of 30.7% and 13.7%, respectively.

Improvements in newborn survival were seen by Dehram et al,<sup>[18]</sup> as gestational age increased.

The most frequent reason for termination of pregnancy was determined to be maternal indication in 128 (85.3%) cases and foetal cause in 22 (14.7%).

The most frequent reason for maternal indication for termination was imminent eclampsia.

Although preeclampsia is one of the risk factors for prematurity, caesarean sections or induction of labour are the most common iatrogenic causes of prematurity in order to reduce maternal and foetal morbidity and mortality.

Although delivery is the only guaranteed treatment for preeclampsia, foetal prognosis should be taken into account in the absence of any complications for the mother.<sup>[11,19]</sup>

In this study, caesarean sections were used to birth nearly 69% of the women. This rate is higher than that stated by Mashiloane and Moodley,<sup>[10]</sup> but comparable to that of Hall et al., who reported an 81.5% caesarean delivery rate.

**Maternal outcome:** The mother's safety must come first in the treatment of severe preeclampsia, followed by the delivery of a live baby who won't need intensive neonatal care.

In our study, 38.6% of the participants had maternal morbidity or death. The greatest percentages of abruption and eclampsia were 17 (11.3%) and 14 (9%), respectively. Other issues included HELLP, DIC, and ARF.

In our analysis, there were 6 (or 4%) maternal deaths. Maternal mortality was found to be 1.8% in a 2012 study by Manisha et al. in New Delhi.

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**Perinatal outcome:** Total Perinatal death IUFD+SB+ND45.

Incidence of PNMTotal PND / No of babies X 10030%

The newborn outcome is influenced by the critical care units and the birth gestational age.

According to Witlin et al., respiratory distress syndrome decreased with gestational age and neonatal prognosis in early-onset severe preeclampsia was directly correlated with birth weight<sup>94</sup>.

90% of the neonates in our research needed neonatal ICU care. Hyaline membrane disease, HIE, IUGR, septicemia, and newborn mortality were the main neonatal consequences.

**Prolongation of pregnancy (vs) outcome:** In their research of 254 women with severe preeclampsia between 20 and 32 weeks, Visser and Wallenburg<sup>20</sup> found a mean pregnancy extension of 14 days and a perinatal death rate of 20%.

In their study, Hall et al,<sup>[18]</sup> revealed that the average length of pregnancy was 11 days, and the perinatal mortality rate was 24%.

In our research Out of 32 individuals who had a pregnancy extension, 27 (87.4%) had a pregnancy extension of 10 days. There was a 25-day maximum extension.

With a range of 1 to 25 days, the average number of days gained was 7 days. Fetal morbidity and death were 9 (28.1%) and 2 (6.2%), respectively. No babies were born still. Patients born at 29 weeks experienced two infant deaths.

In the group of patients who were expecting, there were no maternal deaths, and 4 (12.5%) of the patients developed complications like PP Eclampsia, HELLP, ARF, and Eclampsia.

**Post op BP control:** The majority of individuals had their blood pressure under control within a week. Antihypertensives were only given to 7 individuals upon discharge.

**Postpartum Hospitalisation:** Most of the women's prolonged hospitalisations were done for the benefit of the baby. The average length of postpartum hospitalisation in D.R. Hall's study<sup>14</sup> was 5 days.

## CONCLUSION

Preeclampsia with an early onset is associated with serious problems for both the mother and the foetus. For improved maternal and foetal outcomes, early booking is crucial. A pregnancy termination decision must be made based on both maternal and foetal considerations. In cases of severe, uncontrolled blood pressure with complications, termination should be performed regardless of foetal maturity. The foetal prognosis is improved by a good NICU. In selected cases expectant management in a tertiary care centre limit the impact of serious maternal and fetal complications.

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