

**Research Article****Perinatal Outcome during Expectant Management of Early Onset Severe Preeclampsia****Manjusha Viswanathan<sup>1\*</sup>, Viswanathan K V<sup>2</sup>, Suja Daniel<sup>3</sup>**<sup>1</sup> Associate Professor, Department of Obstetrics and Gynecology, Sree Gokulam Medical College and Research Foundation, Venjaramoodu, Thiruvananthapuram, Kerala, India<sup>2</sup> Associate Professor, Department of Surgery, Government Medical College, Trivandrum, Kerala, India<sup>3</sup> Professor, Department of Obstetrics and Gynecology, Sree Gokulam Medical College and Research Foundation, Venjaramoodu, Thiruvananthapuram, Kerala, India**\*Corresponding author**

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**Abstract:** The objective of the study was to determine the perinatal outcome of expectant management of early onset severe preeclampsia. A prospective study series was conducted at a tertiary teaching hospital over one year period. The inclusion criteria and exclusion criteria for the study were defined. The treatment protocol was finalized and approved by the institutional ethical committee. The patients included in the study (n=105) were monitored in the intensive care unit. The fetal status was monitored by intensive non invasive methods. Pregnancy prolongation and perinatal morbidity and mortality were analyzed. Chi square test was applied to quantitative variables. Pregnancy was prolonged by a mean of 16.7 days the number of days of prolongation of pregnancy was higher when the gestational age was less than thirty weeks. The incidence of admission to neonatal care facility decreased with advancing gestational age. The increase in gestational age also correlated with reduction of RDS. From the one year study we arrive at a conclusion that it is best to deliver the patient with early onset severe preeclampsia, after 33 weeks of gestation by putting her into expectant management. This can be achieved with no increased mortality or morbidity to the mother and better neonatal outcome to the baby.**Keywords:** Early Onset severe preeclampsia, Perinatal outcome, Expectant management.

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**INTRODUCTION**

World health organization has reported that hypertensive disorders during pregnancy are a major cause of perinatal morbidity and mortality. Preeclampsia occurs in 3%-8% of all pregnancies. This forms a major cause (15%-20%) of maternal mortality in developed countries. This is also often the cause of iatrogenic preterm birth, Intra uterine growth restriction and perinatal mortality [1]. Perinatal mortality is increased by 5 times [2]. Pre eclampsia is termed early onset when it occurs before 34 weeks of gestation [3].

The progress of early onset severe preeclampsia is very rapid and traditional practice is to terminate the pregnancy as delivery is the only definitive treatment. There is broad consensus to terminate the pregnancy at 34 weeks. But if the pregnancy is terminated earlier there is higher perinatal mortality and morbidity [4]. The lung maturity may be accelerated with use of corticosteroid [5]. So to improve the neonatal outcome the policy of expectant management was formulated. But expectant management will worsen the maternal condition [6, 7].

Randomized control trial by Sibai *et al.* showed improved perinatal outcome without worsening of maternal condition [8]. Our study also aimed at methods of improving the perinatal out come by expectant management of early onset severe preeclampsia.

**Aim**

To evaluate the perinatal outcome of expectant management of early onset severe preeclampsia

**METHODOLOGY****Design**

Prospective case series extending over a period of one year

**Setting**

A tertiary teaching hospital

**Method of study**

In the study period 105 women were admitted in the ICU with severe early onset severe preeclampsia. On admission if both the mother and fetus were stable

they were put in expectant management. The diagnosis of early onset severe preeclampsia was made according to the criteria put forward by American college of obstetrics and gynecology (ACOG) [9]. Patients with major maternal complications were excluded from the study. This was an observational study and the patients were admitted in the intensive care labor unit of the hospital. The maternal and fetal condition was monitored by non invasive methods and laboratory investigations.

Gestational age was ascertained by means of last menstrual period, Clinical examination and by obstetric ultra sound. Maternal blood pressure was monitored by 4 hourly blood pressure chart. Daily urine protein examination was done. Liver function test and renal function tests were done every 48 hours. Fetus was followed up with daily fetal movement count, symphysio fundal height estimation, Non Stress Test, Ultrasound with biophysical profile every 72 hours and weekly Doppler studies.

Injection betamethasone was given to enhance the lung maturity 12 mg intramuscular, 2 doses 24 hours apart. Anti hypertensives were given in step wise manner to maintain the blood pressure at 140-160mmHg systolic and 90-100 mm of Hg diastolic. The drugs given were alpha methyl dopa, nifedipine and Atenolol (Table 1). Magnesium sulphate was given prophylactically to all patients with severe pre eclampsia. Fresh frozen plasma was given to patients with hypoproteinurea.

Failure to control the blood pressure or development of maternal complication was the indication for delivery (Table 2). Pregnancy of women reaching the gestational age of 34 weeks without any major maternal complications was terminated electively. Fetal viability was fixed at 28 weeks of gestation. Fetal indications for termination of pregnancy were abnormal non stress test, poor biophysical profile in ultra sound, abnormal Doppler studies and intra uterine fetal demise.

The data was collected and were expressed as mean with standard deviation and median with range. Difference in mean were analyzed The Chi-square test was applied to quantitative variable. p value of <0.05 was regarded as significant. The study was compared with other studies.

## RESULTS

During the study period 17582 women delivered in the study hospital. Of them 1066 women (6%) had gestational hypertension or preeclampsia. Out of these 413 women (2%) had severe preeclampsia. This was 38% of all cases of gestational hypertension. 105 women had sever early onset preeclampsia and they were included in the study following the inclusion and exclusion criteria

The mean number of days gained was 16.7 with a median of 14.2 days. When gestational age was less than 30 weeks, the mean gain was 10 days.

Only 5% (n=6) went in for spontaneous labor. 95% (n=99) were induced out of which 85% (n=90) went in for vaginal delivery. In the rest (15%) Lower segment caesarean was done.

Table 4 gives the details of complication that had occurred. This shows that most of the complications occur after 30 weeks of gestation. The data was applied to Table 5 and chi square test was applied. The data obtained was found to be statistically significant.

Intra uterine growth retardation (IUGR) at the time of admission was studied by symphysio fundal height and was confirmed by ultra sound. Of the 105 pregnancies 47% (n=55) had IUGR. Of these 58% (n=32) were mild IUGR and 42% (n=23) were severe.

Among the mothers with IUGR at the end of the study 41.8 % (n=23) had surviving children and among mothers with no IUGR 80% (n=43) had surviving children. Chi Square test was applied to see whether there is any association between the presence of IUGR and survival chance among children. It was found to be statistically significant.

When the relationship between IUGR and birth weight was seen again by applying Chi square test it was found that babies with IUGR during the antenatal period had lower birth weight and this was statistically significant (Table 6).

There were 80 live born babies .The mean birth weight was 1.6 kg median 1.8 kg and standard deviation of 540 grams and the range between 0.5-2.9 kg. There was no evidence of congenital anomalies in the babies of women included in the study.

The sex ratio was skewed towards the female gender, male babies were 32.3% (n= 34) and female babies were 67.7% (n= 71). The chi square test applied for goodness of fit ( $X^2=13.03$ ,  $p<0.001$ ) was applied and was found to be statistically significant.

Here were 13 neonatal deaths, 16 intra uterine deaths and 10 still births.

58% of the live born babies (n=47) were admitted into the neonatal intensive care nursery. The mean duration of the nursery stay was 8.2 days with arrange of 1-21 days. Mean duration of stay in the IBN was 5 days at 29 weeks of gestation. But the survival was 50%. At 34 weeks only 25 of the 50 babies had to be admitted in the neonatal facility.

The mean duration of stay was 5.8 days with 23 survivals and only 2 neonatal deaths

The complications encountered by the neonates after admission to the Neonatal nursery included respiratory distress with need for ventilator support, neonatal convulsions, neonatal sepsis and death. The details are given in Table 8.

Betamethasone was given in 91% of cases (n=96). The perinatal mortality rate was 2.2 in 1000 births ( $\geq 500\text{gms}/7$  days) or 1.7 in 1000 births ( $\geq 1000\text{gms}/7\text{days}$ ). From the study it was seen that gestational age was more of a predictor of neonatal outcome rather than the baby weight.

**Table 1: Antihypertensives used**

Drug	Dose
Alpha methyl dopa	750-2000mg in 3-4 divided doses
Nifedipine	30-40 mg in 3-4 divided doses
Labetalol	200-4000mg in divided doses

**Table 2: Maternal complications**

Eclampsia
HELLP Syndrome
Acute renal failure
Abruption
ascites

**Table 3: Clinical characteristics of study population**

Total number cases	105
Age	18-37 years
Gravida	
Primi	N=77 (73%)
Multi	N=28 (27%)
Gestational age at admission	24-34 weeks

**Table 4: Maternal complications**

Complication	n	$\leq 30$	%	$\geq 31$	%
Ascites	28	9	32	19	68
Decreased Urine output	2	1	50	1	50
Abruption	2	-	-	2	100
Eclampsia	1	-	-	1	100
Uncontrolled blood pressure	5	3	60	2	40
HELLP	3	1	33.5	2	66.5
Death	nil		nil		nil

**Table 5: Maternal complication and gestational age**

	Gestational age		Total (N)	Percentage (%)
	<30	>30		
Maternal complication developed	14	26	40	38
No complication	22	43	65	62
Total	36	69	105	100

**Table 6: Relation between IUGR and birth weight ( $X^2=7.65, p<0.01$ )**

	Wt<2kg	Wt>2kg	Total
No IUGR	35	15	50
Mild	28	4	32
Severe	23	0	23

**Table 7: Relation between gestational age at admission to Neonatal facility and mean duration of stay in ICU**

Gestational age	N	Mean days
29	2	5
30	3	1
31	1	20
32	7	5.5
33	9	4.6
34	25	6

**Table 8: Complications encountered by the neonates**

Gestational Age weeks	Admission (N)	Respiratory distress (N)	Ventilation (N)	Convulsions (N)	Sepsis (N)	NND (N)
≤28	2	1	1	1	1	2
29	2	1	1	0	2	1
30	3	2	1	0	3	2
31	1	1	0	0	0	0
32	7	4	4	3	3	1
33	9	4	3	1	7	0
34	25	13	11	4	17	2

**DISCUSSION**

Studies conducted by Chari & Freidman *et al.* suggest that preeclampsia does not accelerate the lung maturity [10]. Neonatal mortality and morbidity is related to gestational age and use of corticosteroid therapy for accelerating lung maturity [11]. These factors high light the need for expectant management in patients with severe early onset preeclampsia.

In our study the pregnancy was prolonged by mean of 16.7 days with a media of 14.2 days. When the gestational age was less than 30 weeks the mean was 10 day, that means when the women entered into the study at an earlier gestational age the mean number of days gained was more.

In the study by Swami *et al.* in 2012, the median number of days gained were 5 [12]. The study of Hal *et al.* [13] the mean number of days gained were 11; 14 days in study by Patterson [14] and 14 days for Viser *et al.* [15]. In the study by Sibai *et al.* in which 95 patients were included the mean prolongation of pregnancy is 15 days [8].

The neonatal morbidity was related to the gestational age of onset of severe pre eclampsia, presence of IUGR and the number of days gained and gestational age at the time of delivery of the baby. This was also true for the previous studies [11, 16]. Conversely, even if the baby weight was 1.7 kg or more, the survival chance was more when the gestational age was higher. In another multivariate study [11] the neonatal outcome in women with severe preeclampsia and eclampsia between 24 weeks and 34 weeks of gestation was directly correlated with increasing birth weight while increasing age correlated with reduction in respiratory distress syndrome.

Increasing gestational age was seen to decrease the incidence on admission to neonatal care facility. It also decreased the need for intubation from 100% at 27 weeks to 35% at 34 weeks. The incidence of respiratory distress also decreased from 100% at 27 weeks to 23% at 34 weeks.

The overall perinatal survival rates were 50% at 29 weeks 60% at 32 weeks and 80% at 33 weeks. In the study by Hall *et al.* [13] the perinatal survival was 72% at 28 weeks and 92% 29 weeks. The perinatal mortality rates do not correlate with the studies conducted in developed countries [13]. The study in India [12] has comparative results to our study. This shows the inadequacy of neonatal care facilities in developing countries.

The major cause of intra uterine death was placental insufficiency producing severe intra uterine growth retardation. The major cause of still birth also is placental insufficiency. From our study it is seen that women with severe IUGR had poor neonatal out come. Out of the 23 patients with severe IUGR only 7 babies survived.

Respiratory distress syndrome was the major neonatal complication followed by sepsis and convulsions. All these complications were seen to decrease with increasing gestational age rather than the birth weight. Steroids when given were definitely seen to help reduce the neonatal respiratory distress syndrome.

Expectant management can be undertaken by experienced team offering continuous monitoring and care. It is best that such patients be moved to a tertiary care centre with advanced neonatal care facility before the management is offered.

## CONCLUSION

Expectant management of early onset severe preeclampsia where women and fetus are otherwise stable in a tertiary care institution with pragmatic cut off points allows valuable time to be gained and is an acceptable option of management to improve the perinatal outcome. Gestational age at delivery is the key factor that decides the neonatal outcome. With improvements in neonatal care facilities, the delivery of severe preeclampsia patients beyond 32 weeks of gestation. If the neonatal facilities are excellent then the gestational age of elective delivery of the patient may be brought down to 30 weeks and beyond in the best interest of the patient and the neonate. But if the neonatal facilities and expertise are limited, current approach of elective termination remains safe for the mother. So the key factor that decides is the neonatal facility available to us.

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