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## Research Article

# The study of maternal outcome of early onset severe pre eclampsia with expectant management

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## ABSTRACT

**Background:** Hypertensive disorders in pregnancy forms one of the deadly triads along with hemorrhage and jaundice which result in maternal death. The present management is termination of pregnancy which causes high neonatal morbidity. Hence the study is done to assess the outcome of prolongation of pregnancy. The aim of this study was to evaluate the safety and outcome of women undergoing expectant management of early onset severe pre eclampsia.

**Methods:** Prospective case series extending over 1 year in a tertiary care teaching hospital. All women with singleton pregnancy presenting with severe pre eclampsia with gestational age (GA) less than 34 weeks were included in the study. All patients with major maternal or fetal complications were excluded. The included patients were admitted in the intensive care labor ward for non-invasive monitoring of mother. The patients were treated with anti hypertensives,  $\beta$  methasone injection and prophylactic magnesium sulphate when required. They were monitored with regular 4 hrly BP charting, lab investigations and fetal monitoring. The data obtained were expressed as means with standard deviation and median with range. The difference in mean were analysed, the chi-square test was applied to quantitative variables.

**Results:** In women recruited in the study after expectant management the mean and median number of days gained by women ante partum was 16.7 and 14.2 days respectively. It is seen that most of the complications occurs after 30 weeks of gestation. There was no death reported.

**Conclusions:** The results of the study showed that it was best to put the women presenting with early onset severe pre eclampsia in expectant management and deliver her after 34 weeks. This was achieved with no increased mortality or morbidity to mother.

**Keywords:** Severe pre-eclampsia (SPE), Eclampsia, HELLP syndrome

## INTRODUCTION

The incidence of hypertensive disorders of pregnancy is 8% and this forms one of the deadly triads along with hemorrhage and jaundice which result in maternal death. According to WHO severe preeclampsia accounts for 16.1% of maternal deaths in developed countries over the past 2 decades.<sup>1</sup>

### Objective of study

To evaluate safety and outcome of women undergoing expectant management of early onset severe preeclampsia

### Design

Prospective case series over 1 year period.

## Setting

Tertiary teaching hospital

## METHODS

### Inclusion criteria

Over one year period all women with singleton pregnancies and early onset severe pre eclampsia where both mother and fetus were otherwise stable were included in the study.

### Exclusion criteria

Any major maternal or fetal complications.

The definition of hypertension and proteinuria were those accepted by the international society for the study of hypertension in pregnancy. The women thus identified were admitted into the intensive care labor ward for non-invasive monitoring of maternal status.

### Assessment of maternal and fetal status

Gestation was estimated by last menstrual period, obstetric USG or both.

Maternal monitoring was done by 4 hourly BP chart, urine protein examination daily and clinical examination daily, and other relevant investigations every 2 days.

The fetus was monitored by daily fetal monitoring, NST on alternate days, USG with Doppler and BPP every week.

**Table 1: Investigations.**

Maternal		Fetal	
BP chart	4 hourly	Fetal movement count	Daily
Urine protein Estimation	Daily	Non stress test	Every 48 hrs
Clinical examination	Daily	USG with BPP	Every 48 hrs
Liver function test	Every 48 hrs	USG with Doppler	Every week
Renal function test	Every 48 hrs		
Platelet count	Every 48 hrs		

Maternal BP was controlled by anti hypertensives  $\alpha$ -methyl dopa, nifedipine and atenolol in step wise approach. Magnesium sulphate was given prophylactically to all patients. Betnasol was also

administered. Termination of pregnancy was done in event of any adverse maternal condition.

**Table 2: Drugs given for treatment.**

Drug	Dose
$\alpha$ -Methyl dopa	250-500mg 3-4 times daily orally
Nifedipine	10mg 3-4 times daily orally
Atenolol	25mg once or twice daily orally
Inj Betnasol	12mg daily for 2 days
Inj Magnesium sulfate	

The data obtained were expressed as mean with standard deviation and median with range. Difference in mean were analysed the chi square test was applied to quantitative variables. P value <0.05 was taken as significant. The study was compared for analysis with other studies.

## RESULTS

During 1 year period 17585 women delivered in the hospital.

**Table 3: Women delivered during 1 year period.**

Parameter	
No. of deliveries	17585
Cases GHT*	1066 (6%)
Cases SPE	413 (2%)
Cases in study	105

\*GHT - Gestational Hypertension

The youngest woman enrolled in the study was of 18 yrs and oldest 37 yrs.

**Table 4: Age ratio of primi and multi gravida.**

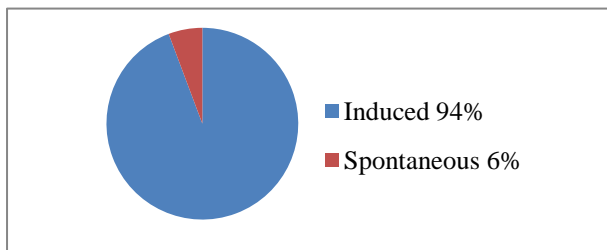
	% of total deliveries	Mean age	SD ratio	% of SPE
Primi	61.9	24.8	3.7	73.3
Multi	38.1	26.1	4.5	26.7

Mean age of admission of primi was 24.8 with SD of 3.7. The mean age of multi was 26.1 with SD of 4.5. The primi accounted for 61.9 % and multi 38.1% of the total. The chi-square test applied  $X^2=5.81$   $p<0.05$ , the observed difference was found to be significant. The nulliparous women were 73.3% and multiparous 26.7% ( $X^2=22.86$ ,  $P<0.001$ ). The finding was significant statistically.

In women recruited in the study after expectant management the mean and median number of days gained by women antepartum was 16.7 and 14.2 days respectively.

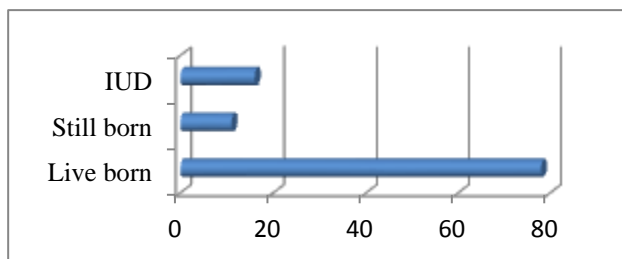
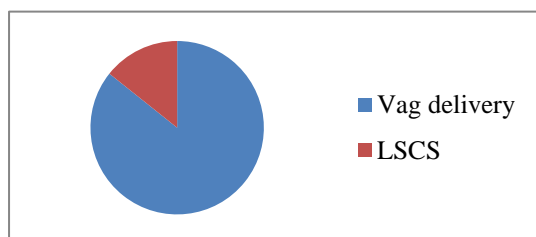
**Table 5: Gestational age at entry and prolongation of pregnancy.**

GA at entry	N	Mean	SD	Median	Range
≤ 25	4	30.8	34.1	24.7	1-74
26	1	-	-	-	-
27	2	38	38.1	38	11-65
28	5	11	9	8	3-26
29	9	16	15.3	12	2-44
30	15	11.7	10.4	10	0-25
31	8	13.4	12.1	12	2-37
32	25	13.6	8.1	14	0-34
33	18	10	10.2	5	0-30
≥ 34	18	5.8	5.7	5	1-13

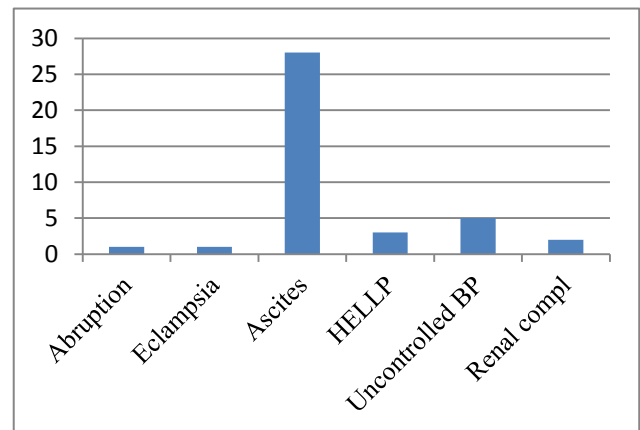
**Figure 1: Relationship between spontaneous and induced labor.**

Only 5% (n=6) went in for spontaneous delivery. 95% were induced with dinoprost gel (n=99).

Of these 15% (n=16) the fetus had died in utero. There were 11 cases (10%) still birth and 78 live born. Vaginal delivery was achieved in 90 cases (85.5%) and rest 15 (14.5%) LSCS was done.

**Figure 2: Shows distribution of intra uterine death, still born and live born.****Figure 3: Relation of vaginal delivery and lower segment caesarean section.****Table 6: Maternal complications encountered.**

Complications	N	%
Abruption	1	1
Eclampsia	1	1
Ascites	28	26.6
HELLP	3	2.8
Uncontrolled BP	5	4.7
Renal impairment	2	1.9
Death	0	0

**Figure 4: Distribution of maternal complications.****Table 7: Relation between complication and gestational age.**

Complication	n	≤ 30	%	≥ 31	%
Ascites	28	9	32	19	68
U/O Decreased	2	1	50	1	50
Abruption	2			2	100
Eclampsia	1			1	100
Uncontrolled BP	5	3	60	2	40
HELLP	3	1	33.5	2	66.5

From the above table it is seen that most of the complications occurs after 30 weeks of gestation. There was no death reported. When chi square test was applied this was found to be significant.

## DISCUSSION

The incidence of hypertensive disorders of pregnancy is 8%. These form one of the deadly triads along with hemorrhage and jaundice that result in maternal death. According to WHO severe preeclampsia accounts for 16.1% of maternal deaths in developed countries over the past 2 decades.<sup>1</sup>

**Table 8: Classification of hypertensive disorders in pregnancy.**

Classification	Gestational age	Definition
Gestational hypertension	≥ 20 weeks	SBP ≥140; DBP ≥90 Absence of proteinuria
Pre eclampsia	≥ 20 weeks with documented normal BP recording prior	Mild Pre eclampsia SBP/DBP ≥140/90 on two occasions 6 hrs apart Proteinuria ≥300mg/24 hrs or ≥1+ on dipstick Severe Pre eclampsia SBP ≥160 DBP ≥110 on two occasions 6 hrs apart Proteinuria ≥5 gm/24 hr or ≥33 on 2 random samples 4 hrs apart End organ signs or symptoms
Pre eclampsia superimposed on C/C hypertension	≥ 20 weeks	Patient without prior proteinuria after 20 weeks of gestation Patients with prior proteinuria Sudden increase in proteinuria Sudden increase in BP that was previously well controlled Thrombocytopenia (<1,00,000 platelets /mm <sup>3</sup> ) Elevated liver function tests
C/C hypertension	< 20 weeks	SBP ≥140 or DBP ≥90 Absence of proteinuria
Transient hypertension of pregnancy	12 weeks post-partum	Diagnosis of gestational hypertension during pregnancy with normalization of BP by 12 weeks post-partum

BP: Blood pressure; DBP: Diastolic Blood pressure; SBP: Systolic blood pressure

Data from national high blood pressure education programme working group, <sup>2</sup>ACOG committee on practice bulletins

### Complications and management

Severe preeclampsia (SPE) is a complex disease with a chronologically unpredictable and progressively deteriorating course. Traditional management has included expedited delivery as the ultimate cure for SPE, aimed at preventing potential end-organ effects. Serious maternal complications of SPE include eclampsia, placental abruption, DIC, renal failure, hepatic hematoma or rupture, pulmonary edema, ARDS, retinal detachment, myocardial infarction, pancreatitis, stroke, and death. The current standard of care, therefore, includes prompt delivery of patients with SPE if the disease develops at or after 34 weeks' GA.<sup>21</sup>

#### Early onset SPE

A clinical conundrum arises in the 0.3% of pregnancies in which SPE develops before 34 weeks' GA.<sup>22</sup> The decision to deliver at early GA requires weighing the risks of iatrogenic prematurity against the risks of prolonging the pregnancy. Numerous authors have suggested varying degrees of expectant management to improve perinatal outcomes. This discussion involves the rationale for expectant management, ideal candidates, contraindications, indications for delivery, and recommendations regarding the mode of delivery.

#### Rationale of expectant management

Given the difficulty in balancing potential maternal morbidity associated with expectant management of SPE

remote from term and the risks of an iatrogenic premature birth, definitive recommendations are limited by the paucity of adequately powered, randomized, controlled trials.

**Table 9: Comparison of signs and symptoms of mild and severe preeclampsia.**

No.	Abnormality	Mild	Severe
1	Diastolic BP	<110 mmHg	>110 mmHg
2	Proteinuria	Trace 1+	Persistent 3+ or more
3	Headache	Absent	Present
4	Visual disturbances	Absent	Present
5	Upper abdominal pain	Absent	Present
6	Oliguria	Absent	Present
7	S. Creatinine	Normal	Elevated
8	Thrombocytopenia	Absent	Present
9	Hyperbilirubinemia	Absent	Present
10	Liver enzyme elevation	Minimal	Marked
11	IUGR	Absent	Obvious
12	Pulm oedema	Absent	Present

Only a few randomized trials have been reported.<sup>20,21</sup> Each study reported improved perinatal outcomes with minimal maternal morbidity. Odendaal and colleagues randomized 38 women with SPE (defined by BP criterion only) who were between 28 and 34 weeks of gestation to immediate delivery after antenatal

corticosteroid administration (n=20) or expectant management (n=18).<sup>20</sup> Mean prolongation of pregnancy in the expectant management group was 7.1 days (P<0.05), with no increase in maternal complications.

In Sibai and associates' study of 95 patients with early onset SPE between 28 and 32 weeks (again diagnosed by BP criterion only), 46 patients were randomized to immediate delivery and 49 to expectant management.<sup>21</sup> Mean pregnancy prolongation was 15.4 days (range, 4-36 days), with no cases of eclampsia.

In a nonrandomized study by Sibai and colleagues, 109 patients with SPE in the second trimester were followed.<sup>22</sup> Expectant management with "aggressive" maternal and fetal surveillance was used for patients more than 24 and no more than 27 weeks' gestation (n=84), and termination was recommended for those no more than 24 weeks' gestation (n=25, with 10 undergoing termination and 15 electing to continue the pregnancy). Expectant management resulted in mean prolongation of pregnancy of 13.2 days (range, 4-28 days). There were no differences between the 2 groups with regard to maternal complications.

The afore mentioned studies showed that expectant management with aggressive monitoring of maternal status may improve the outcome in patients with early onset SPE, but judicious selection of candidates should be employed.<sup>20-22</sup> The ideal candidate for expectant management of preeclampsia is an appropriately counselled patient at least 24+0/7 weeks' and no more than 33+6/7 weeks' GA, with reassuring maternal and fetal status.<sup>18</sup> The lower limits of viability vary among institutions (22+0/7 to 24+0/7 weeks' GA). Counselling patients in the peri viable period should reflect these differences. The patient should be counselled on the likelihood of perinatal survival on the basis of GA, estimated fetal weight, gender, and individual institutional experiences, balanced against the risks of maternal complications. Candidates should be admitted to a tertiary care center with 24-hour availability of obstetricians, anesthesiologists, and a neonatal team. One study demonstrated that approximately 63% of women diagnosed with early onset SPE are eligible for expectant management using this criteria.<sup>9</sup>

In our study most of the women were primi gravida this confirms with the widely considered hallmark of pre eclampsia. The finding that among the multi gravida there were significant women who had pre eclampsia in the previous pregnancy also confirm the common finding that there is 11-12% increase in the incidence of pre eclampsia once they get pre eclampsia in the first pregnancy. The pregnancy was prolonged by 16.7 days with a median of 14.2 days.

When the gestational age was less than 25 weeks, the mean gain in prolongation of pregnancy was 10 days. Thus when the women entered into the study at early gestational age the mean number of days gained was

more [11 days in study by Hall & Odendaal (2000); 14 days in study by Pattirson et al. (1998); 10 days in study by Viser et al.].

**Table 10: Mean prolongation of pregnancy in days by various studies.**

Study	Mean prolongation in days
Index study	16.7
Hall & Odendaal	11
Pattirson et al.	14
Viser et al.	10

In the index study there were 38% maternal complications which is comparable to 27% in hall et al.<sup>23</sup> The control of BP was carefully applied with 2 or 3 drugs. There was no complication like intracerebral bleed (ICB). It should be noted that ICB is one of the important cause of maternal mortality in South Africa. There were no such complications reported by Hall et al. The occurrence of HELLP syndrome (2.8%) was lower than figure of 20% reported in the overview of HELLP.<sup>28</sup>

## CONCLUSIONS

From the one year study, it was found that there was a gain of 16 days when the mother with early onset SPE was put in expectant management. The maternal complications were as per the international standards and there was no increase in mortality and morbidity of the mother. Hence it will be advantageous to put a patient with early onset severe pre eclampsia in expectant management rather than terminate the pregnancy immediately as the practice is now. But to obtain optimum outcome the selection of patients and maternal care in a tertiary care centre is preferable.

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*Ethical approval: The study was approved by the institutional ethics committee*

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