

# Maternal and Perinatal Outcome in Severe Pre-eclampsia and Eclampsia

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## Abstract

**Background:** Pre-eclampsia is a leading cause of maternal and perinatal morbidity and mortality worldwide. Present study was planned to find the maternal and perinatal outcome in patients of severe pre-eclampsia and eclampsia.

**Methodology:** It is a prospective study, carried out on 100 pregnant women admitted with severe pre-eclampsia and eclampsia at a tertiary care referral unit. Detailed history and examination was carried out. Investigations like complete hemogram, liver function tests, renal function tests, coagulation profile, fundus and 24 hours urine for protein were done. Obstetric management was done as per existing protocol in the department, magnesium sulphate was the drug of choice for controlling convulsions, and blood pressure was controlled either by oral nifedipene or methyl dopa. Maternal and perinatal complications were noted down.

**Results:** The majority of the patients was unbooked (82%), belonged to lower socioeconomic status (84%) and had rural background (84%). Headache was the most common antecedent symptom (44%) followed by epigastric pain (20%), oliguria (9%), blurring of vision (8%) and ascitis (5%). There was high incidence of maternal complications like PPH (31%), abruption placentae (11%), renal dysfunction (8%), pulmonary edema (8%), pulmonary embolism (4%), HELLP syndrome (2%) and DIC (2%). Maternal mortality was 8% and the causes were pulmonary embolism in four women, DIC in two, HELLP and pulmonary edema in one each. Perinatal complications were also high 71.43% were low birth weight, 66% had preterm delivery, 52.4% babies had birth asphyxia and 28.57% were still born. Maternal and perinatal outcome was much poorer in eclampsia as compared to severe pre-eclampsia.

**Conclusion:** There is a very high maternal and perinatal morbidity and mortality and 82% patients had no antenatal care. Good antenatal care could have been prevented severe pre-eclampsia and eclampsia to some extent. Thus it is suggested that developing countries have to go a long way to create awareness about importance of antenatal check ups and take measures for implementation.

**Keywords:** Pre-eclampsia, eclampsia, maternal morbidity, perinatal morbidity.

## INTRODUCTION

Hypertensive disorders are the most common medical complication occurring in 12-22% of all pregnancies.<sup>1</sup> Pre-eclampsia remains a leading cause of hypertension, complicating up to 10% of the pregnancies.<sup>2</sup> It refers to the new onset of hypertension (systolic blood pressure  $\geq$  140 mm Hg or diastolic blood pressure  $\geq$  90 mm Hg) and proteinuria ( $\geq$  0.3 gm protein in 24 hours urine specimen) after 20 weeks of gestation in a previously normotensive woman.<sup>3</sup>

Pre-eclampsia is considered severe if the blood pressure is  $\geq$  160 mm Hg systolic or  $\geq$  110 mm Hg diastolic or proteinuria of 5 gm or higher in a 24 hours urine specimen or oliguria, cerebral or visual disturbances, pulmonary edema, impaired liver function or thrombocytopenia is present.<sup>4</sup> Eclampsia is defined as the presence of new onset grandmal seizure in a woman with pre-eclampsia. In 44% the seizures occur postnatally, in 38% occur antepartum and 18% in the intrapartum period.<sup>5</sup>

Pre-eclampsia is a leading cause of maternal and perinatal morbidity and mortality worldwide.<sup>2</sup> Various complications associated with pre-eclampsia and eclampsia are preterm labor, IUGR, IUD, accidental hemorrhage, pulmonary edema, cardiac failure, HELLP syndrome (3%), disseminated intravascular coagulation (3%), renal failure (4%), adult respiratory distress syndrome (3%) and cerebral hemorrhage (1.2%).<sup>4</sup> Pre-eclampsia and eclampsia accounts for 24% of all maternal deaths in India.<sup>12</sup> Maternal death is largely following complications from abruptio placentae, hepatic rupture and eclampsia.<sup>6</sup> Overall perinatal mortality is increased five-fold in patients of pre-eclampsia with iatrogenic prematurity being the main culprit.<sup>7</sup> Despite advances in medical practice, pre-eclampsia and eclampsia still remains a leading cause of maternal and perinatal morbidity and mortality throughout the world. Clinical studies of pre-eclampsia and eclampsia can be used for the evaluation of safe motherhood program at population level. The present study was planned to

evaluate and compare maternal and perinatal outcomes in patients of severe pre-eclampsia and eclampsia at a tertiary care referral hospital.

## METHODOLOGY

The present study was carried out on 100 pregnant women with more than 20 weeks of gestation of severe pre-eclampsia and eclampsia who were admitted in the Department of Obstetrics and Gynecology at a tertiary care referral unit in India.

On admission, detailed history regarding age, parity, period of gestation, signs and symptoms, obstetric and family history was recorded from the patient or patient's attendant, as appropriate. After that, general physical, abdominal and pelvic examinations were carried out. Investigations like complete hemogram, absolute platelet count, liver function tests, renal function tests, coagulation profile, fundoscopy and 24 hours urine for protein were performed in all the patients. Obstetric management was carried out as per existing protocol in the department. Magnesium sulphate was the drug of choice for controlling convulsions, if contraindicated, phenytoin was given. Blood pressure was controlled either by oral nifedipine or methyl dopa singly or in combination as per the need. Details of labor whether it was spontaneous or induced, method of induction and mode of delivery were recorded. Maternal and perinatal complications were noted down. At the end of the study, the data was compiled and analyzed.

## RESULTS

Results are shown in Tables 1 to 5. Most common presenting symptom was convulsions (51%), followed by headache (44%), epigastric pain (20%), blurring of vision (8%), oliguria (9%) and ascites (1%). Eighteen (18%) of the patient had no symptoms, they were just referred for high blood pressure, and 41, 31 and 10 had one, two and three symptoms respectively. There were 49 patients with severe pre-eclampsia and 51 with eclampsia. Out of 51 patients of eclampsia, 41 (80.39%) had antepartum eclampsia, 10(19.61%) had postpartum and no patient had intrapartum eclampsia in the present study.

Renal and liver functions were deranged in 27% and 20% patients respectively (Table 2). Commonest mode of induction was with oral misoprostol. There were total of 98 patients who delivered as two patients died in antepartum period without delivery. Thirty-two percent women were delivered by lower segment cesarean section (LSCS) and the indications were fetal distress (59.28%) followed by nonprogress of labor (12.5%), impending eclampsia with poor bishop score (18.75%) and breech in (9.38%). In 95% patients magnesium sulphate was given as anticonvulsant and in other 5% phenytoin regimen was started as magnesium sulphate was contraindicated. Average hospital stay was  $6.32 \pm 4.07$  day. Hospital stay was less than three days, 4-6 days, 7-10 days and more than 10 days in 25, 29, 42, and four patients respectively. One patient had to stay for more than 20 days due to wound infection after cesarean section.

Maternal complications were high as there was increased incidence of PPH (31%), APH (11%), renal dysfunction (9%) and pulmonary complications (12%). There were total of eight maternal deaths and the causes were pulmonary embolism in four women, DIC in two, HELLP and pulmonary edema in one each. Perinatal complications were also very high due to increased incidence of Prematurity (67.33%), low birth weight (71.43%), birth asphyxia (21.43%). Perinatal mortality was 36.73%, out of which 28.57% were still births and 8.16% babies died in nursery due to low birth weight and birth asphyxia.

## DISCUSSION

Despite advances in medical practice, pre-eclampsia/eclampsia has remained a leading cause of maternal mortality throughout the world. It is a common problem in developing countries because of illiteracy, poor antenatal care, lack of health awareness and poverty.

The majority of the patients were unbooked (82%), belonged to low socioeconomic status (84%), had rural background (84%), were less than 30 years of the age (90%) and were primigravida (73%) (Table 1). Ketz et al reported 70% women as primigravida.<sup>8</sup>

**Table 1:** Distribution of patients as per demographic profile and other parameters

Booking status	Residence		Education		Age (Years)		Parity		Gestation(weeks)		
Booked	18%	Rural	84%	Illiterate	39%	< 20	19%	0	73%	≤ 28	7%
						21-30	71%	1	17%	29-36	59%
Unbooked	82%	Urban	16%	Literate	61%	30-40	10%	2	10%	≥ 37	34%
						Mean	24.04	Mean	0.47	Mean	34.58
						±SD	± 4.2			±SD	± 4.08

**Table 2:** Distribution of patients as per investigations

Proteinuria (%)	Renal function tests (%)		Liver function tests (%)		Fundoscopy (%)		
≤ + 1	4%	Blood urea ≥ 40 mg%	45%	SGOT > 100 IU	20%	Normal	94%
+2	23%	S. Creatinine ≥ 1 mg%	27%	SGPT > 100 IU	20%	Hypertensive changes	3%
≥ ± 3	73%	Oliguria	9%	Alkaline phosphatase > 400 IU	34%	Papilloedema	3%

**Table 3:** Distribution according to mode of induction and delivery

	Mode of induction		Mode of delivery	
Induced (48%)	Spontaneous	52%	Vaginal	55 (56.04%)
	Oral misoprostol	38%	Instrumental	9 (9.18%)
	PGE <sub>1</sub> Gel	8%	LSCS	32 (32.65%)
	Foley's catheter	2%	Hysterotomy	2 (2.04%)

**Table 4:** Maternal and fetal complications

Maternal complications n (%)	Fetal complications n (%)	
PPH	31(31%)	
Abruptio placentae	1(11%)	
Renal dysfunction	9(9%)	
Pulmonary edema	8(8%)	
Pulmonary embolism	4(4%)	
HELLP syndrome	2(2%)	
DIC	2(2%)	
Maternal mortality	8(8%)	
	Preterm	66 (67.33%)
	Weight (< 2.5kg)	70 (71.43%)
	Birth asphyxia	21 (21.43%)
	IUD	28 (28.57%)
	IUGR	23 (23.47%)
	Shifted to nursery	28 (28.57%)
	GCMF	0
	Perinatal mortality	36 (36.73%)

**Table 5:** Comparison of maternal and perinatal outcome in eclampsia and severe pre-eclampsia

Parameter	Maternal outcome		Parameter	Perinatal outcome	
	eclampsia n (%)	S. Pre-eclampsia n (%)		eclampsia	S.Pre-eclampsia n (%)
Abruptio placentae	1(1.96)	10(20.41)	Preterm	38(74.51)	28(57.14)
HELLP	1(1.96)	1(2.04)	SGA	10(19.61)	13(26.53)
Renal dysfunction	6(11.76)	2(4.08)	Birth asphyxia	13(25.49)	8(16.33)
Pulmonary edema	7(13.73)	1(2.04)	IUD	15(29.41)	12(26.53)
Pulmonary embolism	2(3.92)	2(4.08)	GCMF	0	0
PPH	26(50.98)	5(10.20)	Shift to nursery	20(39.22)	8(16.33)
DIC	2(3.92)	0	Weight (< 2.5 kg)	35(68.63)	25(51.02)
Death	4(7.84)	4(8.16)	Perinatal mortality	19(37.25)	17(34.69)

SGA: Small for gestational age, IUD: Intrauterine death, GCMF: Gross congenital fetal malformation, PPH: Postpartum hemorrhage, DIC: Disseminated intravascular coagulation.

Prematurity is commonly associated with eclampsia and severe pre-eclampsia. Most of the cases (66%) had preterm delivery. Almost similar findings were reported by Tuffnell et al (65.3%).<sup>9</sup>

Headache was the most common antecedent symptom present in 44% of the patients followed by epigastric pain (20%) and blurring of vision (8%). Douglas et al<sup>4</sup> reported headache, epigastric pain and blurring of vision in 50%, 19% and 19% patients respectively, results are almost similar to the present study. Labor was induced in 48% of the patients either with foley's catheter or prostaglandins. Tuffnell et al<sup>9</sup> reported induced labor in 36.2% of the patients. Thirty two percent patients had LSCS (Table 2), while Tuffnell et al<sup>9</sup>, Al Inizi et al<sup>10</sup>, Sibai et al<sup>11</sup> reported cesarean section rate of 72.1%, 54% and 49% respectively which is much higher than present study.

Tuffnell et al<sup>9</sup> observed pulmonary embolism, renal dysfunction, pulmonary edema and maternal mortality in 0.28%, 0.55%, 2.30% and nil respectively. While in the present study these were 4%, 9%, 8% and 8% respectively, which is 4-20 times higher.<sup>9</sup> The reason may be that in his study there were

only 7.54% patients of eclampsia as compared to 51% in present study and the morbidity and mortality for eclampsia is much more than pre-eclampsia.

The maternal complications are comparable with study of Begum et al<sup>12</sup> which was conducted in Bangladesh, while other studies<sup>8,10,11,13</sup> reported very less complications and this may be due to the reasons that these studies are conducted in developed countries where management is much better and patients come earlier to the hospital than the developing countries. The perinatal mortality reported by Tuffnell et al<sup>9</sup>, Al Inizi et al<sup>10</sup>, Sibai et al<sup>11</sup>, and Douglas et al<sup>4</sup> are 4.7%, 14.6%, 1.8% and 7.05% respectively. While in the present study the perinatal mortality was 36.73%, which is quite high.

It is observed that patients of eclampsia had more complications as compared to severe pre-eclampsia. In eclampsia renal dysfunction, pulmonary edema and postpartum hemorrhage complicated 11.76%, 13.73% and 50.98% as

compared to only 4.08%, 2.04% and 10.20% respectively in patients of severe pre-eclampsia (Table 5). Perinatal outcome was also much poorer in eclampsia as compared to severe pre-eclampsia. Incidence of birth asphyxia was almost twice in eclampsia as compared to severe pre-eclampsia. Twenty babies (39.22%) had to be shifted to nursery in eclampsia as compared to only 8 babies (16.33%) in severe pre-eclampsia (Table 5).

## CONCLUSION

There is a very high maternal and perinatal morbidity and mortality in patients of severe pre-eclampsia and eclampsia. 82% patients had no antenatal care. Would they have come for antenatal check up, severe pre-eclampsia and eclampsia could have been prevented. Early diagnosis and good prenatal supervision can prevent eclampsia to a large extent and appropriate treatment will ameliorate many cases sufficiently so that maternal and fetal outcome is satisfactory. Thus it is suggested that developing countries have to go a long way to create awareness about antenatal check ups and take measures for implementation.

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