

**MATERNAL AND FETAL OUTCOME IN PRE-ECLAMPSIA AND ECLAMPSIA**Sipra Singh<sup>1</sup>, Smita Kumar<sup>2</sup>, Shanti Singh<sup>3</sup><sup>1</sup>Professor, Department of Obstetrics & Gynaecology, Katihar Medical College, Katihar.<sup>2</sup>Resident, Department of Obstetrics & Gynaecology, Katihar Medical College, Katihar.<sup>3</sup>Professor, Department of Obstetrics & Gynaecology, Katihar Medical College, Katihar.**ABSTRACT****BACKGROUND**

Pre-Eclampsia and Eclampsia are the leading causes of maternal and perinatal morbidity and mortality worldwide. In developed countries, much lower incidences have been achieved through aggressive screening and management of Pre-Eclampsia. In developing countries like India, there is a wide gap in quality of health care in cities and rural area. The present study was done to evaluate the incidence of hypertensive disorders and maternal and fetal outcome in a tertiary care centre catering to poor people of Bihar, Bengal and neighboring country, Nepal.

**MATERIALS AND METHODS**

This is an observational descriptive study. After obtaining institutional ethical committee approval and informed consent from patients, all the patients presenting to our institution for delivery with Pre-Eclampsia and Eclampsia were included in the study. Socio-economic status, frequency of ANC, age, parity and period of gestation were recorded. Investigations included complete blood count, urinary protein, coagulation profile, liver function tests and kidney function tests. Mode of conduct of delivery and maternal and fetal outcome were thoroughly recorded and described. Data was presented in the form of n (%).

**RESULTS**

64.28% cases with Pre-Eclampsia and 95.12% cases with Eclampsia were from low socio-economic status. 95.12% cases with Eclampsia and 67.5% cases with Pre-Eclampsia had no ANC throughout the pregnancy. Most of the patients were in the age group of 20-25 years. 86.11% cases with Eclampsia and 66.68% with Pre-Eclampsia were primigravida. Most of the patients presented with 37 weeks of gestation. 54.76% Pre-Eclampsia cases and 58.94% Eclampsia delivered by L.S.C.S. Pulmonary edema and acute renal failure were the most common complications. Maternal mortality was 25.60% in Eclampsia cases. The most common cause of maternal mortality was pulmonary edema. Incidence of IUD+ stillbirth was 16.66% in Pre-Eclampsia cases and 34.14% in Eclampsia cases. Overall perinatal mortality was 28.57% in Pre-Eclampsia cases and 52.84% in Eclampsia cases. The most common cause of fetal mortality was Asphyxia.

**DISCUSSION**

Incidence of Eclampsia was high because of lack of awareness regarding antenatal check up. Period of gestation was >37 weeks and due to infrequent ANCs, diseases remained unrecognized and patients came to the hospital only after onset of labor pain or even trial of labor by untrained *dais* and quacks at home. Due to late detection of cases, maternal and fetal outcome was very poor.

**CONCLUSION**

There is a lack of awareness about significance of regular ANC and Pre-Eclampsia and Eclampsia are usually recognized late, mostly when they have already developed complications. Maternal and fetal outcome is still very poor in rural areas of the country.

**KEYWORDS**

PRE-ECLAMPSIA, ECLAMPSIA, Ante natal check up.

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Corresponding Author:

Dr. Sipra Singh, Professor,

Department of Obstetrics & Gynaecology,

Katihar Medical College, Katihar, Bihar-854105.

E-mail: drsiprasingh@gmail.com

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**INTRODUCTION: BACKGROUND:** Pre-Eclampsia and Eclampsia are the leading causes of maternal and perinatal mortality and morbidity worldwide. Pre-Eclampsia refers to new onset of systolic blood pressure greater than 140 mm of Hg or diastolic blood pressure greater than 90 mm of Hg associated with urinary loss of more than 0.3 gm protein in 24 hours. Severe Pre-Eclampsia refers to systolic blood pressure more than 160 mm of Hg or diastolic blood

pressure of more than 110 mm of Hg associated with urinary protein loss of more than 5 gm in 24 hours. Eclampsia is occurrence of seizures in Pre-Eclampsia patients that cannot be attributed to other causes. Pre-Eclampsia and Eclampsia are multisystem disorders affecting various systems including the respiratory system, neurological system, cardiovascular system, hepatic system and renal system resulting in high incidences of mortality and morbidity.

Incidence of Pre Eclampsia is variable in different parts of the world. Pre-Eclampsia complicates 6-10% of all pregnancies in U.S.A and the incidence is supposed to be much higher in developing countries.<sup>1,2</sup> Incidence of Eclampsia is 1 in 2000 live births in developed countries and 1 in 200 to 1 in 1700 live births in developing countries. Worldwide, Pre-Eclampsia and Eclampsia account for about 63,000 maternal deaths annually.<sup>3</sup> Pre-Eclampsia and Eclampsia are also associated with high incidence of poor fetal outcome. Risk to the fetus is due to placental insufficiency leading to insufficient supply of oxygen and nutrients to the fetus.

There is a wide variation in incidence of hypertensive disorders and maternal and fetal outcome between developed and developing countries. In developed countries, much lower incidences have been achieved through aggressive screening and management of Pre-Eclampsia. In developing countries like India, there is a wide gap in quality of health care in cities and rural area. The present study was done to evaluate the incidence of hypertensive disorders and maternal and fetal outcome in a tertiary care centre catering to poor people of Bihar, Bengal and neighboring country, Nepal.

**MATERIALS AND METHODS:** This was a observational descriptive study carried out at Katihar Medical College, Katihar during the study period of April 2012 to March 2014. After obtaining institutional ethical committee clearance and informed consent from patients or their relatives, patients with Pre-Eclampsia and Eclampsia presenting for conduction of delivery to our institute were included in the study.

**Inclusion Criteria:** Pre-Eclampsia: more than 20 weeks of pregnancy with blood pressure  $\geq$  140/90 mm of Hg with proteinuria and presenting for conduction of delivery.

**Eclampsia:** Patients of Pre-Eclampsia with convulsions presenting for conduction of delivery.

**Exclusion Criteria:** Period of gestation less than 20 weeks, patients with known seizure disorder, patients with chronic hypertension and patients who had delivered outside and reached hospital for control of seizure.

Detailed history regarding age, parity, period of gestation, obstetric history and family history were obtained from patients or relatives as appropriate. If patient presented with Eclampsia, detailed history of time of onset, number of fits, interval between fits, time elapsed since last fit, loss of consciousness, fall leading to physical injuries were recorded. Prescription regarding hypertension and for control of fits were thoroughly examined. General physical examination included pulse, blood pressure, pallor, icterus and edema. Systemic examination included respiratory system examination, cardiovascular system examination, neurological system examination and pelvic examination. Investigations included complete blood count, routine urine, liver function tests, kidney function tests, coagulation profile and serum electrolytes. Magnesium sulphate as per Pritchard regimen was used for control of convulsions. In patients where magnesium sulphate was contraindicated, Lytic cocktail was used. Oral Methyl Dopa, Nifedipine and Labetalol were used for control of blood pressure. Intravenous Labetalol was used for emergency control of blood pressure. Obstetric management of each case was done considering control of blood pressure, state of convulsion and period of gestation. Delivery of baby was expedited by induction of labor or emergency L.S.C.S. L.S.C.S was done for obstetric indication. Patients were monitored for signs of toxicity by clinically monitoring loss of knee jerk, urinary output and respiratory rate. Maternal and neonatal outputs were thoroughly monitored.

**RESULTS:** During the study period of April 2012 to March 2014, a total of 6370 deliveries were conducted. During this study period, 84 cases of Pre-Eclampsia and 246 cases of Eclampsia were admitted for conduction of delivery. Incidences of Pre-Eclampsia and Eclampsia were 13.19/1000 deliveries and 38.62/1000 deliveries, respectively. Most of the patients (67.5% case of Pre-Eclapmsia and 95.12% cases of Eclampsia) did not even have a single antenatal checkup. Only 5% cases of Pre-Eclampsia and no case of Eclampsia had regular antenatal check up. 64.28% patients of Pre-Eclampsia and 95.12% patients of Eclampsia were of low socio-economic status. 29.76% patients of Pre-Eclampsia and 4.78% cases of Eclampsia were of middle socio-economic status (Table 1).

Parameter	Categories	Pre-Eclampsia 84 n(%)	Eclampsia 246 n(%)
Socioeconomic status	Low income group	54(64.28%)	234(95.12%)
	Middle income group	25(29.76%)	12(4.78%)
	High income group	5(5.92%)	0
Frequency of ANC	None	57(67.5%)	234(95.12%)
	Infrequent	25(29.76%)	12(4.78%)
	Regular	5(5.96%)	0

Age	<20 yrs	10(11.90%)	45(18.29%)
	20-25 yrs	42(50%)	126(51.22%)
	25-30 yrs	21(25%)	66(26.93%)
	>30 yrs	11(15%)	9(3.65%)
Gravidity	G1	56(66.68%)	212(86.11%)
	G2	8(9.5%)	12(4.87%)
	G3	12(14.28%)	18(7.31%)
	G4	8(9.4%)	4(1.62%)
Period of gestation	<28 weeks	8(9.5%)	8(3.25%)
	28-37 weeks	20(23.81%)	75(30.48%)
	>37 weeks	56(66.66%)	161(65.44%)

**Table 1: Demographic parameters**

Maximum number of cases of Pre-Eclampsia (50%) and Eclampsia (51.22%) were in the age group of 20-15 years. 11.90% cases of Pre-Eclampsia and 18.29% cases of Eclampsia were in the age group of <20 years. 25% cases of Pre-Eclampsia and 26.93% cases of Eclampsia belonged to the age group of 25-30 years. 15% cases of Pre-Eclampsia and only 3.65% cases of Eclampsia were of age >30 years.

Most of the patients (66.66% cases of Pre-Eclampsia and 86.17% cases of Eclampsia) were primigravida. Only few (9.4% cases of Pre-Eclampsia and 1.62% cases of Eclampsia) were gravida 4 or more.

Most patients of Pre-Eclampsia (66.66%) and Eclampsia (65.44%) had more than 37 weeks of period of gestation (Table 1).

Investigations	Range	Pre-Eclampsia 84 n(%)	Eclampsia 246 n(%)
Proteinuria	Trace(0.1gm in 24 hrs)	8(9.52%)	7(2.46%)
	+(0.3 gm in 24 hrs urine)	24(28.57%)	10(0.04%)
	++(1.0gmin 24 hr urine)	28(33.33%)	76(30.89)
	+++ (3 gm in 24 hr urine or more)	24(28.57%)	153(62.19)
Serum creatinine	< 1.2 mg/dl	54(64.28%)	127(51.62)
	1.3-2,0 mg/dl	22(26.19%)	94(38.11%)
	> 2.0 mg/dl	8(9.52%)	25(10.16%)

**Table 2: Clinical Investigations**

Most patients of Pre-Eclampsia (60%) had blood pressure in the range of 140/90-160/110 mm of Hg where as 65.44% cases of Eclampsia had blood pressure more than 160/110 mm of Hg.

Most patients of Pre-Eclampsia (71.42%) had 1+ or 2+ proteinuria whereas 62.19% patient had 3+ proteinuria.

Majority (90%) of patients of Pre-Eclampsia and Eclampsia had serum creatinine level less than 2 mg/dl. Only about 10% cases of Pre-Eclampsia and Eclampsia had serum creatinine levels more than 2.0 mg/dl (Table 2).

217(88.21%) cases of Eclampsia had antepartum convulsions. Only 10(4.06%) and 19(7.72%) patients had convulsion in intrapartum and postpartum period, respectively.

Route of delivery	Mode of delivery	Pre-Eclampsia 84 n(%)	Eclampsia 246 n(%)
Vaginal	Spontaneous	14(16.66%)	42(17.07%)
	Induced	22(26.17%)	55(22.35%)
	Forceps	2(2.38%)	4(01.62%)
	Total vaginal deliveries	38(45.23%)	101(41.055)
L.S.C.S	L.S.C.S	46(54.76%)	145(58.94)

**Table 3: Mode of delivery**

Among the Pre-Eclampsia patients, 38(45.23%) delivered vaginally and 46(54.76%) delivered by L.S.C.S. whereas among the Eclampsia patients 101(41.05%) cases delivered vaginally and 145(58.94%) cases delivered by L.S.C.S (Table3).

	Pre-Eclampsia 84 n(%)	Eclampsia 246 n(%)
Post partum hemorrhage	5(5.95%)	22(8.94%)
Abruption placentae	4(4.70%)	20(8.13%)
Pulmonary oedema	11(13.09%)	35(14.22%)

Renal failure	6(7.14%)	24((9.76%)
Sepsis	0	21(8.53%)
Visual disturbances	0	6((2.43%)
Cerebrovascular accidents	0	10(4.11%)
DIC	0	7(2.84%)
HELLP SYNDROME	4(4.70%)	6((2.43%)
Maternal mortality	0	63(25.60%)
<b>Table 4: Table showing the maternal complication in Pre-eclampsia</b>		

The most common complication in Pre-Eclampsia and Eclampsia was pulmonary edema. The second most common complication was renal failure. Overall mortality in Eclampsia was 25.60%. There were not a single mortality in Pre-Eclampsia cases (Table 4).

	<b>Pre Eclampsia 84 n(%)</b>	<b>Eclampsia 246 n(%)</b>
IUD+Stillbirths	14(16.66%)	84(34.14%)
Live births	70(83.33%)	162(65.84%)
Pre term	9(10.71%)	28(11.38%)
IUGR	22(26.19%)	68(27.64%)
NICU admission	18(25.71%)	85(52.46%)
Early neonatal death	10(14.28)	46(28.39%)
Perinatal mortality	24(28.57%)	130(52.84%)
<b>Table 5: Fetal outcome</b>		

There were 70 live births in pre-eclamptic patients, combined number of IUD and stillbirths were 14(16.66%). Out of 70 live births 10(14.28%) died in early neonatal period. In eclamptic patients there were 162(65.84%) live births and 84(34.14%) IUD+ stillbirths. Out of 162 live born babies 46(28.39%) died in the early neonatal period. (Table 5)

**DISCUSSION:** The incidence of Pre-eclampsia and Eclampsia in our study at our centre is 1.39% and 3.82%, respectively. The incidence of Eclampsia is much higher than other studies done by D. J. Tuffnell, et al<sup>4</sup> (0.52%) and C. Y. Chen, et al<sup>5</sup> (0.067%) because the incidence in developed countries is very low compared to developing countries. Our incidence rate is comparable with studies of Singh S. and Behra A.<sup>6</sup> (3.2%). Incidence of Pre-Eclampsia is low as compared to study of S. A. Obed<sup>7</sup> & P. Aniteye (7.03%) and Conde Agudelo A.<sup>8</sup> and Belizan M.<sup>9</sup> (4.8%). This difference is due to disproportionate distribution of severe Pre-Eclampsia and Eclampsia cases at our institution. The patients coming to this tertiary care centre are illiterate and very poor. There is a lack of education and awareness regarding regular antenatal checkups so most patients reach the hospital very late, usually after they have already had episodes of convulsions at home. The above statement is quite clear from the fact that 95% patients in the study are from low socio-economic status and 95% of the patients had no or irregular ante-natal checkups. Jamila M. Naib<sup>10</sup> in her study found that 100% cases of Eclampsia belonged to low socio-economic class and 100% of them had no ANC. Agarwal, Swain S., B. Shaheen, et al and Singh S. and Bahera A. have reported prevalence of no ANC as 92%, 97.7%, 86% and 97.4%, respectively.<sup>11,12,13,14</sup>

Most of the patients in the present study belonged to the age group of 20-25 years. This is probably because women from poor socio-economic class are usually married at an early age. The parity has followed a similar pattern as

reported in most existing literature with Pre-Eclampsia and Eclampsia being common among primigravida. Sibai B. M., et al and Singh S. and Bahera A. have reported the proportion of primigravida among eclamptic patient to be 84% and 81.75% respectively.<sup>15</sup> 86% patients with Eclampsia and 66.68% of Pre-Eclampsia patients were primigravida in our study.

Tuffnell, et al reported a high incidence of prematurity (65.3%) among eclamptic patients. In our study, the mean period of gestation was more than 37 weeks in both Pre-Eclampsia (66.66%) and Eclampsia (65.44%), which is in contrast to findings by Tuffnell, et al. However, our study supports other studies from south-east Asia. Y. M. Chan and S. W. Ngai reported mean period of gestation >37 weeks and Singh S. and Bahera A. reported 66% eclamptic cases with a period of gestation >37 weeks. It is quite evident that most of the hypertensive parturients remain unaware of their high blood pressure and seek medical help only when they develop convulsions or go in to spontaneous labour.

Among Pre-Eclampsia patients, swelling of legs was the most common complaint (70%) followed by headache (48%), epigastric pain (22%) and blurring of vision (9%). Douglas, et al reported headache, epigastric pain and blurring of vision in 50%, 19% and 19%, respectively, results almost similar to that of our study.

Labor was induced in 26.17% cases of Pre-Eclampsia and 22.3% case of Eclampsia. Tuffnell, et al reported induction of labor in 36.2% of patients. Alamin et al, Sibai, et al and Tuffnell, et al have reported 54%, 48% and 72%

cases of caesarean section, respectively. We found the incidence of caesarean to be 58.94% in Eclampsia cases and 54.76% in Pre-Eclampsia cases. High incidence of caesarean section is due to the fact that trial of labor had already been done at home by untrained *dais* and quacks, and the patients reached the hospital when trial of labor had failed.

90% of Pre-Eclampsia cases and 93% of Eclampsia cases had proteinuria. Our findings are supported by those of Meyer, et al who reported a 92% incidence of proteinuria in eclamptic patients.

Maternal complication rate is much higher in Eclampsia cases than Pre-Eclampsia cases. Al Mulhin A. A., et al found placental abruption as the most common complication (12%) in Pre-Eclampsia cases.<sup>16</sup> Sibai B. M., et al found abruption in 21.66%, coagulopathy in 8.37%, hypertensive encephalopathy in 3.335%, intracerebral hemorrhage in 3.3% and hepatic hematoma in 1.66%. The most common complication in our study was renal failure (14.22% in Eclampsia cases and 13.09% in Pre-Eclampsia cases) followed by renal failure (9.76% Eclampsia cases and 7.14% in Pre-Eclampsia cases). The complication rate is quite high in our study as the patients were referred to our hospital at a very late stage by the time had already developed complications. Mortality rate in Eclampsia cases was very high because of high complication rates. The most common causes of maternal deaths were acute renal failure and pulmonary edema. According to Gowaripada Dutt, maternal mortality was directly proportional to number of fits and it was noted to be highest when the number of fits was more than 10 and when convulsion-delivery interval was more than 48 hours.<sup>17</sup> Swan S., et al observed that Eclampsia related death was much higher if the mother had more than 15 convulsions (63.6% versus 26.1% for 6-15 convulsions and 0-5 convulsions respectively).

Fetal outcome was also poor in cases of Eclampsia as compared to cases of Pre-Eclampsia. Incidence of IUD + stillbirths was 16% in Pre-Eclampsia patients compared to 34% in Eclampsia cases. Out of live born babies, 25% in Pre-Eclampsia cases and 52.46% in Eclampsia cases required NICU admission. Early neonatal mortality was 14.28% of live born in Pre-Eclampsia cases and 28.93% in Eclampsia cases. Total perinatal mortality (IUD+ stillbirth+ early neonatal death) was 42.45% in Pre-Eclampsia cases and 52.84% in Eclampsia cases. Most common cause of perinatal death was birth asphyxia, High perinatal mortality is due to the fact our centre is a tertiary care centre and most of the patients who reach here have severe degree of Pre-Eclampsia and Eclampsia. Most of the patients reach the hospital when fetal heart rate is absent or very low.

**CONCLUSION:** Awareness regarding regular antenatal checkups is very low particularly among the poor uneducated population. Pre-Eclampsia and Eclampsia are diagnosed very late, mostly when they have already developed complications. Most of the deliveries are still being conducted at home by untrained *dais* and quacks and patients reach the hospital very late resulting in high maternal and fetal mortality.

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