

# Maternal and Fetal Outcome in Eclampsia.

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## ABSTRACT

**Background:** (1) To study maternal outcome in eclampsia in relation to respiratory complications, fever, DIC, renal system affection and electrolyte imbalance. (2) To study the fetal outcome in eclampsia in relation to small for gestational age, intrauterine death, neonatal mortality, perinatal mortality and need for NICU admission. **Study Design:** It was a cross-sectional prospective study conducted at Government Medical College Nagpur over a period of 3 months (14 May to 14 July). **Methods:** The study was approved by the Institutional ethical committee. All patients admitted in the department of obstetrics and gynaecology at government medical college Nagpur with eclampsia was enrolled for the study as per the criteria given. It was a cross-sectional prospective study conducted from 14 May to 14 July (3 months) on women admitted with eclampsia after the gestational age of 20 weeks and presented with convulsions. The outcome in relation to maternal and neonatal morbidity and mortality was studied on the basis of various complications and defined parameters. **Result:** A total of 43 patients were enrolled in the study. The most common age group of patients who had eclampsia after 20 weeks of gestation belonged to age group of 21-25 years followed by more than 25 years and the least common age group was between 18- 20 years of age. The mean age was found to be 24.23 years. Out of the studied cases 21 (48.83%) were primigravida and 22 (51.16%) were multigravidae. 16 (37.20%) patients visited doctor for ANC visits once or twice while 8 (18.60%) patients visited the doctor thrice, 9 patients made 4 ANC visits while 10 patients were such that they didn't make even a single ANC visit before getting admitted in our hospital with seizures. Patients with term pregnancies made up 34.88% of the total patients while 65.11% patients were preterm. The most common signs and symptoms seen in these patients were Headache (92%), Nausea and vomiting (90%), Epigastric pain (32%), anasarca (23%) and sudden blindness (6%). Out of 43 patients normal vaginal delivery took place in 22 (51.16%) and LSCS was done in 21 (48.83%) of the patients. The most common indication of LSCS in patients with eclampsia was fetal distress (47.61%) followed by unfavourable cervix (28.57%), failure of induction (14.28%) and contracted pelvis (9.52%). The most common complications seen in patients with eclampsia included Respiratory complications like aspiration pneumonia, pleural effusion and pulmonary oedema, which were seen in 11 (25.58%) patients followed by fever (23.25%) and haematuria (23.25%). The least common complications encountered were cardiomyopathy and cerebrovascular accidents which were seen in 2 patients (4.65%) each. Serious complications like disseminated intravascular coagulopathy, renal failure and deranged hepatic functions were seen in 16.27%, 6.97% and 13.95% respectively. convulsions to delivery interval was found to be a significant determinant of outcome and complications were found to be more common if this period exceeded more than 6 hours. Electrolyte imbalance was seen in 5 (11.62%) patients. An analysis of fetal outcome revealed that the babies born to mothers with eclampsia were small for gestational age in 46.51% cases while the incidence of intrauterine death was 25.58% and neonatal mortality was seen in 34.88%. The overall perinatal mortality was found to be 60.46%. **Conclusion:** Less ANC visits were associated with more threat and complications. Eclampsia was found to be associated with preterm delivery. Increase in convulsion to delivery interval lead to increase severity of complications. Fever was found to be significantly associated with increase morbidity and its cause needs to be explored. Electrolyte imbalance was also responsible for difficulty in management and its causes need to be studied in detail.

**Keywords:** Eclampsia, Convulsion to delivery time, maternal and fetal outcome.

## INTRODUCTION

Eclampsia is defined as the onset of convulsions in the setting of preeclampsia when any other neurological cause of convulsions has been ruled out.<sup>[1]</sup> The earliest historical documentation of eclampsia comes from Hippocrates, who noted that headaches, seizures and altered consciousness were ominous signs seen in some pregnancies. The term

eclampsia first appeared in the Varandaeus treatise on gynaecology.<sup>[2]</sup>

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Even centuries before varandaeus coined the term eclampsia a similar illness was described by Gabelchoverus (in 1596) who divided epilepsy into four types one of which included epilepsy resulting from t pregnant uterus.<sup>[3]</sup> And since historical time this disease continues to affect approximately 15-70 per 10,000 deliveries in developing countries. The incidence is much lower in developed countries.<sup>[4]</sup> The higher incidence of eclampsia and its complications in developing world may be attributed to early age at first pregnancy, poorly equipped maternal health care centres and under utilization of available healthcare facilities.<sup>[5]</sup> Eclampsia is one of the major causes of maternal and fetal morbidity and mortality. Various maternal complications in eclampsia are seizures associated complications like status and aspiration pneumonia. Electrolyte imbalance and other more serious complications like disseminated intravascular coagulopathy, renal failure, elevated liver enzymes and HELLP and neurological deficits can also occur and may be life threatening.<sup>[6]</sup> The common cardiac complications seen in eclampsia may include increased work load, diastolic dysfunction, left ventricular failure and myocardial damage. <sup>[7]</sup> Other complications may include cortical blindness, abruptio placenta and later development of long term metabolic and cardiac complications. <sup>[8]</sup> Serious and untreated cases may result in maternal death.<sup>[9]</sup> In the fetus intrauterine growth retardation, preterm delivery, birth asphyxia and cerebral palsy are commonly associated with eclampsia. Pregnancy related complications associated with eclampsia like status, DIC and abruptio placenta put both mother and fetes at risk. In developing countries non-availability of NICU care compounds the problems of a neonate born to a mother having eclampsia. Need for intensive neonatal care and perinatal mortality is increased.<sup>[10]</sup>

## MATERIALS AND METHODS

The present study was conducted on 43 pregnant women with more than 20 weeks of gestation and having eclampsia who were admitted in the Department of Obstetrics and Gynaecology at Government Medical College Nagpur. AT the time of admission detailed history regarding age, parity, gestational age, history of eclampsia in previous pregnancy, Family history of eclampsia and present complaints were recorded from the patient or relative depending upon the condition of the patient. A detailed physical examination, abdominal and pelvic examinations were done. Investigations like complete haemogram, platelet count, Kidney function tests, SGOT,SGPT, Serum prothrombin time, Bleeding time and clotting time funduscopy, Ultrasound and 24 hours urine for protein were performed in all the patients. Patients were managed as per the department protocol. Magnesium sulphate

was preferred for managing convulsions, alternatively phenytion was given. Methyldopa or nefidipene were given to control blood pressure. At the end of the study, the data was compiled and analysed. Maternal Outcome was studied in terms of respiratory complications, Fever, DIC, Hepatic and renal dysfunction and electrolyte imbalance. Fetal outcome was studied in terms of small for gestational age, intrauterine death, NICU admissions neonatal and perinatal mortality.

The objective of our study was to study maternal and fetal outcomes in eclampsia. We also sought to compile the data for frequency distribution of eclampsia according to age, parity, maternal complications and fetal outcome in eclampsia.

## RESULTS

43 pregnant women with gestational age more than 20 weeks have been included in this study. Analysis of age of the patients revealed that the most common age group to have eclampsia was 21-25 years. 18 (41.86%) patients belonged to this age group. 13 (30.23%) patients belonged to age group of more than 25 years while 12 (27.91%) patients belonged to age group of 18-20 years. The mean age was found to be 24.23 years.

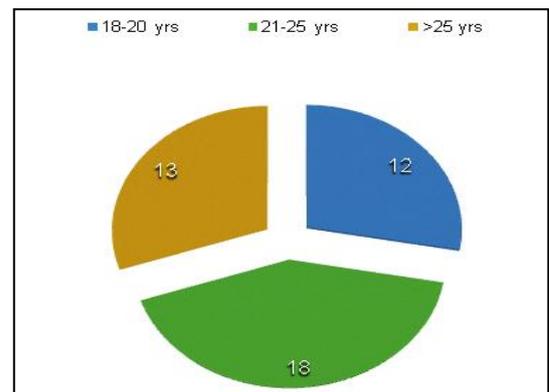


Figure 1: Age distribution of the studied cases.

The analysis of parity distribution revealed that 22 (51.16%) patient belonged to multipara group and 21 (48.83%) patients belonged to primigravida group.

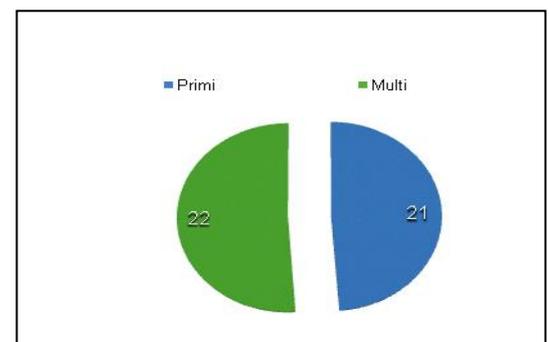


Figure 2: Parity Distribution of studied cases.

Out of the studied cases maximum patients (37.20%) had already visited ANC clinic once or twice. 10 (23.25%) patients never visited any ANC clinic while 8 (18.60%) and 9 (20.93%) patients had visited ANC clinics 3 and 4 times respectively.

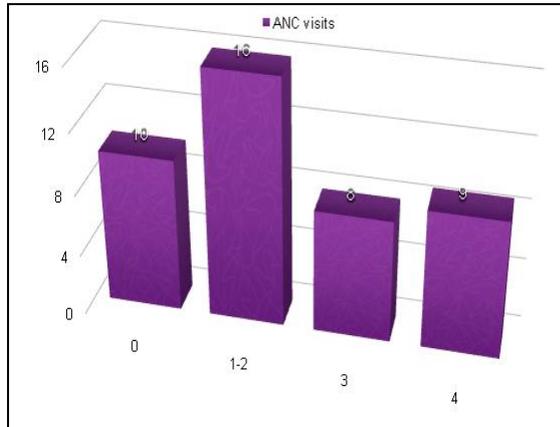


Figure 3: Parity Distribution of studied cases.

The analysis of gestational age of the patient revealed that 28 (65.11%) patients were preterm i.e. less than 37 weeks of gestation while 15 (34.88%) patients had gestational age more than 37 weeks. It was important to analyse this data because preterm deliveries are fraught with the risk of respiratory distress and other perinatal complications in newborn and the baby is more likely to need neonatal intensive care facilities if delivered prematurely.

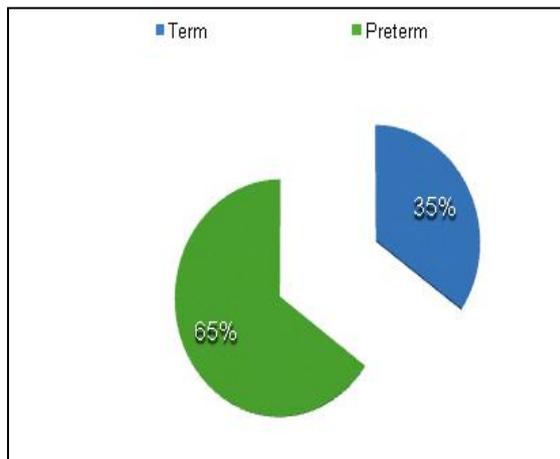


Figure 4: Gestational age distribution.

Out of 43 cases of eclampsia admitted and studied normal delivery could be possible in 22 (51.16%) and LSCS was done in 21 (48.83%) patients. The indications for which LSCS was done was Fetal distress, Unfavourable cervix, failure of induction and contracted pelvis which was seen in 10 (47.61%), 6 (28.57%), 3 (14.28%) and 2 (9.52%) patients respectively.

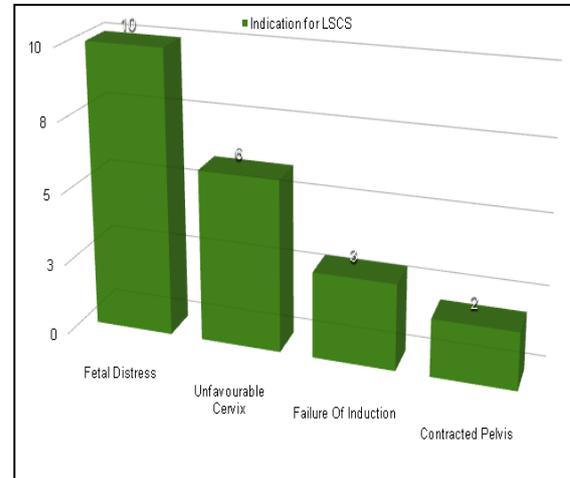


Figure 5: Indications for LSCS in patients with eclampsia.

Headache was the most common symptom seen in 92% of the patients followed by nausea and vomiting which was seen in 90% patients. Less common symptoms encountered were epigastric pain, anasarca and sudden blindness, which were seen in 32%, 23.25% and 6% patients respectively. Analysis of neonatal outcome and mode of delivery revealed that out of 22 patients who were delivered by normal vaginal delivery 17 (77.27%) were preterm and 5 (22.72%) were term babies. 9 (40.9%) babies required NICU admissions for various indications like meconium aspiration, birth asphyxia, respiratory distress and for preterm care. 10 (23.25%) were stillborn while 6 (27.27%) died within 12 hours of birth. Amongst the 21(48.83%) babies delivered by LSCS 10 (47.61%) were term and 11 (52.39%) were preterm. There were no stillbirths, 8 (38.09%) babies expired within 12 hours of birth and 10 (47.61%) required NICU admissions for various reasons including preterm care, respiratory distress and for surfactant administration.

Table 1: Mode of delivery and its relation to neonatal morbidity and mortality.

Mode Of Delivery	Number	Stillbirths	Death Within 12 hours	NICU Admissions	Term	Preterm
LSCS	21	0	8 (38.09%)	10 (47.61%)	10 (47.61%)	11 (52.38%)
Vaginal	22	10 (23.25%)	6 (27.27%)	5 (22.72%)	5 (22.72%)	17 (77.27%)

The maternal complication most commonly associated with eclampsia were found to be

respiratory complications (25.58%), Fever (23.25%), haematuria (23.25%), acute renal failure (16.27%),

elevated liver enzymes (13.95%) and electrolyte imbalance (11.62%). Less common but serious complications like DIC (6.97%), abruptio placenta (6.97%), cardiomyopathy (4.65%), cerebrovascular accidents (4.65%) and HELLP (2.32%) were also seen in some patients. Common respiratory complications seen were Aspiration pneumonia and pulmonary edema which were seen in 11.62% and 4.65% patients respectively.

**Table 2:** Complications associated with eclampsia.

Complications	Number of Patients	Percentage
Respiratory symptoms	11	25.58
Fever	10	23.25
hematuria	10	23.25
Acute renal failure	7	16.27
Elevated Liver Enzymes	6	13.95
Electrolyte Imbalance	5	11.62
DIC	3	6.97
Abruptio placenta	3	6.97
Cardiomyopathy	2	4.65
Cerebrovascular accidents	2	4.65
HELLP	1	2.32

Out of 7 patients developing acute renal failure only 1 patient needed dialysis and recovered within 10 days of onset of renal failure. Out of 3 patients who

developed disseminated intravascular coagulopathy all three received blood and fresh frozen plasma and all of them were delivered within 24 hours of developing convulsions.

Electrolyte imbalance was seen in 5 (11.62%) patients out of which hypokalaemia and hypocalcemia was seen in 2 (4.65%) patients, hyperkalemia and hyponatremia in 2 (4.65%) and 1 (2.32%) patient respectively.

**Table 3:** Electrolyte imbalance seen in Patients with eclampsia.

Imbalance	Number
Hypokalaemia, Hypocalcemia	2
Hyperkalemia	2
Hyponatremia	1

Convulsion to delivery interval was found to be one of the important prognostic factor in development of various complications seen in patients of eclampsia. The incidence of complications like respiratory symptoms, fever, haematuria, ARF, elevated liver enzymes, electrolyte imbalance, DIC, Abruptio placenta, cardiomyopathy and HELLP was studied in relation to convulsion to delivery interval.

**Table 4:** Convulsion to delivery interval as an important prognostic factor.

	Number of patients	Resp. Symptoms	Fever	Haematuria	ARF	Elevated Liver Enzymes	Electrolyte imbalance	DIC	Abruptio placenta	Cardiomyopathy	HELLP
0-6 hours	11(25.58%)	3	2	2	1	2	2	0	1	1	0
6-12 hours	14(32.55%)	2	3	3	3	2	0	2	1	0	0
12-24 hours	12 (27.9%)	4	3	4	2	1	1	1	1	1	1
> 24 hours	6 (13.95%)	2	2	1	1	1	2	0	0	0	0

**Table 5:** Convulsion to delivery interval as an important prognostic factor.

APGAR	No	Death	Term	Preterm	NICU Admission	Birth Wt > 2.5 kg	Birth Wt < 2.5 kg
<7	12	11(91.66%)	3	9	10 (83.3%)	2	10
>=7	21	9 (42.85%)	12	10	9 (42.85%)	4	18

The analysis of fetal outcome in eclampsia revealed that out of the babies born to studied cases 46.51% were small for gestational age and 25.58% died in utero. Neonatal mortality was estimated to be 34.88% and total perinatal mortality in studied cases was 60.46%. Out of 33 live born babies 12 newborns had Apgar score of less than 7 and 21 babies had an APGAR score of more than 7. Out of the babies who had APGAR score less than 7, 11 (91.66%) died and out of 21 patients with an Apgar score more than 7,

9(42.85%) expired. The babies having apgar score less than 7 required NICU care in 83.33% cases while in babies with APGAR score more than 7 NICU admission was needed in 42.85% cases.

Neonatal outcome was dependent upon birth weight of the baby, gestational age, birth asphyxia, presence or absence of meconium aspiration and Apgar score at birth. An Apgar score less than 7 was significantly associated with neonatal mortality (91.66%) while an APGAR score of more than 7 was associated with

a lower neonatal mortality rate. Majority of the newborns with an APGAR score less than 7 needed NICU admissions. Various indications for which they were admitted in Neonatal intensive care units were for prematurity, birth asphyxia, respiratory distress and for surfactant administration.

## DISCUSSION

Eclampsia is known to mankind since ancient times. Even centuries before the term “eclampsia” was coined in the Varandaeus treatise on gynaecology, it was recognized as a type of epilepsy associated with pregnancy. It is one of the major causes of maternal and fetal morbidity and mortality.<sup>[11]</sup> Proteinuria and hypertension are cardinal features of pre eclampsia. The incidence and complications associated with eclampsia is more in developing world because of early pregnancies and lack of awareness, poverty and insufficient healthcare facilities.<sup>[12]</sup> As the exact aetiology is still unknown the preventive and therapeutic measures are still not very satisfactory. The only effective management available is delivery which, though reduces blood pressure levels significantly may not be feasible if the gestational age is less or if the foetus has still not reached viability or even if the foetus has reached viability but still preterm. In these circumstances the neonatal outcome may be unsatisfactory. Such neonates are prone to develop respiratory distress secondary to surfactant deficiency, intracranial haemorrhage, bronchopulmonary dysplasia and sepsis.<sup>[13]</sup>

Though the exact aetiopathogenesis of eclampsia is not known the various factors proposed to be responsible for the occurrence of eclampsia are maternal immunologic intolerance, altered placental implantation, genetic, nutritional, and environmental factors, inflammatory and cardiovascular changes.<sup>[14]</sup> Some authors have described the role of angiogenic factors like vascular endothelial growth factor (VEGF) and placental growth factor (PlGF) in the causation of eclampsia.<sup>[15]</sup> Occurrence of cases of pre eclampsia within families have been recognised since decades pointing towards a possible genetic cause as one of the underlying factors. Though in some families pre- eclampsia seems to follow the Mendelian inheritance pattern<sup>[16]</sup> many studies have found discordance for pre-eclampsia between monozygotic twins suggesting that irritability caused by maternal genes was low.<sup>[17]</sup>

The maternal complications related to preeclampsia usually are severe hypertension, seizures, bleeding diathesis, thrombocytopenia, deranged liver enzymes, HELLP, Acute renal failure, abruptio placenta, cardiomyopathy, diastolic dysfunction of heart and cerebrovascular accidents.<sup>[18]</sup> The anticipation and early diagnosis with prompt treatment is necessary because many of these complications may turn life threatening. For this purpose patients need to be hospitalized if any of the

warning signs like headache, fever or altered sensorium is present. Although visual disturbances are common, in patients, having severe eclampsia total blindness is rare and sometimes blindness can be reversible with proper treatment. Again, proper and immediate treatment is the essence of management otherwise; a permanent blindness may be caused by the involvement of occipital cortex leading to cortical blindness.<sup>[19]</sup> Other causes of blindness in preeclampsia are exudative retinal detachment and hypertensive retinopathy.<sup>[20]</sup>

The neonatal complications associated with preeclampsia include intrauterine growth retardation, Intrauterine deaths, complications associated with preterm deliveries, intracranial haemorrhage, respiratory distress, surfactant deficiency induced hyaline membrane disease, neonatal sepsis, bronchopulmonary dysplasia and need for NICU admissions.<sup>[21]</sup> As the only definitive management of severe eclampsia is delivery it becomes of utmost importance to keep in mind the effect such a preterm delivery might have on newborn. Severe pre eclampsia was found to have also been associated with low apgar scores in newborn babies.<sup>[22]</sup> Babies with low APGAR scores are prone for developing various complications like periventricular leukomalacia leading to germinal matrix haemorrhage, respiratory distress hypoglycaemia and hypocalcemia.<sup>[23]</sup> The neonates delivered early to control severe eclampsia may require intensive neonatal care.<sup>[24]</sup> These babies may need long term follow up to detect long term sequel of prematurity and birth asphyxia like cerebral palsy. Many studies have concluded that eclampsia in the mother is associated with increased risk of cerebral palsy in preterm and low birth weight infants.<sup>[25]</sup>

## CONCLUSION

- Our study concludes that less ANC visits are associated with more threat of complications and hence more awareness and enabling factors should be created to access antenatal facilities.
- Eclampsia leads to preterm delivery, which may be responsible for neonatal morbidity and mortality.
- More convulsion- delivery interval means more risk of DIC, increased severity of complications of respiratory and renal system and increase morbidity.
- Fever was found to be a significant complication, its cause needs to be explored for proper management as it adds up to maternal and fetal morbidity.
- Causes of electrolyte imbalance need to be studied in detail as it may lead to misdiagnosis and mismanagement.

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