Original Research Article

# Study of risk factors of eclampsia in a tertiary care center

Padma Chandavathu[1], Akurathi Krishna Rao[2*]

[1]III Year PG, [2]Professor & HOD, Department of Obstetrics and Gynaecology, Katuri Medical College and Hospital, Guntur, Andhra Pradesh.
**Email:** chandavathupadma@gmail.com

## Abstract

**Background:** Nearly one-tenth of maternal deaths in Asia and Africa are associated with hypertensive disorders of pregnancy. Hypertensive disorders (HD) are the most common medical disorders complicating pregnancy with overall prevalence between 5 -10% and are considered as a main cause for maternal and perinatal morbidity and mortality worldwide. The aim of this study was to assess the risk factors in eclamptic patients treated at a tertiary care hospital. **Material and Methods:** This was a prospective, observational study conducted at the Department of obstetrics and gynaecology in pregnant women coming to labour room with more than 20 weeks gestational age with generalised tonic clonic convulsions with pre-eclampsia were included in present study. **Results:** After applying inclusion and exclusion criteria, total 130 patients were considered for present study. Most common characteristics were age below 25 years (71 %), gestational age 34-36 weeks, primipara patients, education up to primary standard or illiterate (69 %), less than 4 antenatal visits (84 %) and antepartum eclampsia (70 %). We noted less than 140 mm of Hg Systolic Blood Pressure on admission (52 %), 90-110 mm of Hg diastolic Blood Pressure on admission (54 %), 2+ proteinuria traces on urine test strip (48 %), 7-12 g/dL hemoglobin (73 %), ≥100/mm3 platelets (91 %), normal bilirubin (96 %) and normal creatinine (95 %) in patients with eclampsia. 54 % patients delivered vaginally. We delivered 94 % patients within 12 hours from first convulsion. **Conclusion:** Eclampsia prediction is difficult but still majority of cases can be easily prevented by education to girls, adequate and proper antenatal check-ups. These simple measures increase pre-eclapmsia diagnosis and thus eclampsia. Early MgSO4 also plays a significant role in preventing maternal and neonatal mortality and morbidity.
**Key Word:** eclampsia.

***Address for Correspondence:**
Dr. Akurathi Krishna Rao, Professor & HOD, Department of obstetrics and Gynaecology, Katuri Medical College and Hospital, Guntur, Andhra Pradesh, INDIA.
**Email:** chandavathupadma@gmail.com
Received Date: 17/08/2019 Revised Date: 24/09/2019 Accepted Date: 12/10/2019
DOI: https://doi.org/10.26611/10121224

| Access this article online | |
|---|---|
| Quick Response Code: | Website: www.medpulse.in |
| | Accessed Date: 09 November 2019 |

## INTRODUCTION

Nearly one-tenth of maternal deaths in Asia and Africa are associated with hypertensive disorders of pregnancy. Hypertensive disorders (HD) are the most common medical disorders complicating pregnancy with overall prevalence between 5 -10% and are considered as a main cause for maternal and perinatal morbidity and mortality worldwide.[1,2] Among the hypertensive disorders, preeclampsia and eclampsia have the greatest impact on maternal and new-born morbidity and mortality. Majority of deaths related to pre-eclampsia and eclampsia could be avoided if women received timely and effective care, delivered according to evidence-based standards. Major maternal complications included placental abruption (10 %), neurological deficits (7%), aspiration pneumonia (7%), pulmonary edema (5%), cardiopulmonary arrest (4%), and acute renal failure (4%). Moreover, 1 percent of these women died. Several subsequent reports similarly described excessive maternal morbidity and mortality rates with eclampsia that also included HELLP syndrome, pulmonary embolism, and stroke[3]. Other complications in eclampsia are some degree of blindness, substantively altered consciousness, including persistent coma and rarely psychosis. The prognosis for return to normal function is good and is usually complete within 1 to 2 weeks postpartum[4]. Risk factors for eclampsia

How to cite this article: Padma Chandavathu, Akurathi Krishna Rao. Study of risk factors of eclampsia in a tertiary care center. *MedPulse International Journal of Gynaecology.* November 2019; 12(2): 31-35. http://medpulse.in/Gynacology/index.php

reported in high-income countries include young and old maternal age, obesity before pregnancy, being unmarried, excessive weight gain during pregnancy, multiple gestations, nulliparity, chronic hypertension, low socioeconomic status, prolonged birth interval, lack of prenatal care, and current smoking[5,6.] Until other causes are excluded, however, all pregnant women with convulsions should be considered to have eclampsia. The aim of this study was to assess the risk factors in eclamptic patients treated at a tertiary care hospital.

## MATERIAL AND METHODS

This was a prospective, observational study conducted at the Department of obstetrics and gynaecology, Katuri Medical College and Hospital, Guntur. Study was conducted over a 1-year period, from January 2018 to December 2018. Institutional ethics committee gave approval for present study. All pregnant women coming to labour room with more than 20 weeks gestational age with generalised tonic clonic convulsions with pre-eclampsia were included in present study. Pregnant women less than 20 weeks gestation OR with history of epilepsy OR with known cause for convulsions were excluded from present study. Unless and until proved, convulsions in more than 20 weeks gestational age pregnant female are treated as eclampsia. A written informed consent for participation in present study obtained from the accompanying relative or the patient if fully conscious. On admission, a detailed history is taken from the patient's attendant with a reference to the referral letter if available, previous record reviewed and a thorough clinical examination is done. Hypertension, neurosensory deficit, fetal assessment and BISHOPs score were important in examination. A bedside test for proteinuria is then done from a catheter specimen of urine. Blood sample is obtained for investigations, such as a full blood count, platelet count, coagulation profile, renal function tests, and liver function tests. Initial resuscitation and stabilization are done in the emergency room before transfer to the labor ward. Magnesium sulphate is the drug of choice for the control and prevention of seizures. All eclampsia patients received it. Nifedepin and labetalol used for control and prevention of hypertension. The aim is to keep the diastolic blood pressure between 90 and 100 mmHg. After stabilization, the mode of delivery was decided depending upon favourability of the cervix, gestational age, previous obstetric history, etc. The patients were then subsequently followed up till discharge from the hospital. Statistical analysis was done using descriptive statistics.

## RESULTS

After applying inclusion and exclusion criteria, total 130 patients were considered for present study. Most common characteristics were age below 25 years (71 %), gestational age 34-36 weeks, primipara patients, education up to primary standard or illiterate (69 %), less than 4 antenatal visits (84 %) and antepartum eclampsia (70 %). We noted less than 140 mm of Hg Systolic Blood Pressure on admission (52 %), 90-110 mm of Hg diastolic Blood Pressure on admission (54 %), 2+ proteinuria traces on urine test strip (48 %), 7-12 g/dL hemoglobin (73 %), ≥100/mm$^3$ platelets (91 %), normal bilirubin (96 %) and normal creatinine (95 %) in patients with eclampsia. 54 % patients delivered vaginally. We delivered 94 % patients within 12 hours from first convulsion.

**Table 1:** Maternal characteristics

| | No of patients | Percentage |
|---|---|---|
| **Maternal age** | | |
| ≤20 years | 34 | 26% |
| 21-25 years | 58 | 45% |
| 26-30 years | 18 | 14% |
| 31-35 years | 9 | 7% |
| ≥35 years | 11 | 8% |
| Gestational age | | |
| <34 weeks | 43 | 33% |
| 34-36 weeks | 73 | 56% |
| ≥37 weeks | 14 | 11% |
| Parity | | |
| 0 | 76 | 58% |
| 1–2 | 40 | 31% |
| 3 or more | 14 | 11% |
| Educational status | | |
| Illiterate | 34 | 26% |
| Primary | 56 | 43% |

| | | |
|---|---|---|
| Up to 10th standard | 22 | 17% |
| More than 10th standard | 18 | 14% |
| Antenatal visits | | |
| 0-1 | 36 | 28% |
| 02-04 | 73 | 56% |
| > 4 | 21 | 16% |
| Type of eclampsia | | |
| Antepartum | 91 | 70% |
| Intrapartum | 15 | 12% |
| Postpartum | 24 | 18% |
| Systolic Blood Pressure on admission | | |
| ≥160 mmHg | 28 | 22% |
| 140-159 | 35 | 27% |
| <140 | 67 | 52% |
| Diastolic Blood Pressure on admission | | |
| ≥110 | 11 | 8% |
| 90-110 | 70 | 54% |
| <90 | 49 | 38% |
| Proteinuria (traces on urine test strip) | | |
| nil to 1+ | 45 | 35% |
| 2+ | 63 | 48% |
| ≥3+ | 22 | 17% |
| Pre-existing antenatal medical/ obstetric complications | | |
| Hypothyroid | 17 | 13% |
| Hypertensive disorders of pregnancy | 11 | 8% |
| Polyhydramnios | 3 | 2% |
| Multiple gestation | 5 | 4% |
| Hemoglobin | | |
| ≥12 g/dL | 21 | 16% |
| 7-12 g/dL | 95 | 73% |
| <7 g/dL | 14 | 11% |
| Platelets ($10^3$/mm3) | | |
| ≥100 | 118 | 91% |
| 50-99 | 8 | 6% |
| <50 | 4 | 3% |
| Bilirubin | | |
| <12 mg/dL | 125 | 96% |
| ≥12 mg/dL | 5 | 4% |
| Creatinine | | |
| ≤100 µmol/L | 123 | 95% |
| >100 µmol/L | 7 | 5% |
| Duration from first convulsion to delivery (in hours) | | |
| < 6 | 23 | 18% |
| .6–12 | 99 | 76% |
| > 12 | 8 | 6% |
| Mode of delivery | | |
| Vaginal | 70 | 54% |
| Instrumental – vacuum | 11 | 8% |
| Instrumental – forceps | 5 | 4% |
| LSCS | 44 | 34% |

The most common complications of eclampsia in this study were renal impairment (16%), intracranial haemorrhage (15%), HELLP syndrome (13%), liver impairment (11%), disseminated intravascular coagulopathy (DIC), (10%), postpartum hemorrhage (9%), acute pulmonary oedema (9%), massive blood transfusion (7%), septic complications (7%), placental abruption (6%), anaesthetic complications (3%), maternal death (3%). Maternal deaths were due to massive intracranial haemorrhage.

**Table 2:** Maternal complications in patients with eclampsia

| | No of patients | Percentage |
|---|---|---|
| Renal impairment | 21 | 16% |
| Intracranial haemorrhage | 19 | 15% |
| HELLP syndrome | 17 | 13% |
| Liver impairment | 14 | 11% |
| Disseminated intravascular coagulopathy (DIC) | 13 | 10% |
| Postpartum hemorrhage | 12 | 9% |
| Acute pulmonary oedema | 12 | 9% |
| Massive blood transfusion | 9 | 7% |
| Septic complications | 9 | 7% |
| Placental abruption | 8 | 6% |
| Anaesthetic complications | 4 | 3% |
| Maternal death | 4 | 3% |

We noted that most common birthweight was 1500-2500 grams (48 %), less than 6 APGAR score was noted in 12 % babies. 8 % stillbirth and 14 % early neonatal deaths were noted. Total 43 % babies required NICU admission. Most common causes were prematurity, low birth weight, fetal distress during delivery.

Table 3- Perinatal outcome in eclamptic patients

| | No of patients | Percentage |
|---|---|---|
| Birth weight (grams) | | |
| ≤500 | 1 | 1% |
| 501-1000 | 9 | 7% |
| 1001-1500 | 34 | 26% |
| 1501-2500 | 63 | 48% |
| >2500 | 23 | 18% |
| Apgar score at 5 minutes | | |
| 1-2 | 6 | 5% |
| 3-6 | 9 | 7% |
| ≥7 | 104 | 80% |
| Neonatal outcome | | |
| Stillbirth | 11 | 8% |
| Early neonatal death | 18 | 14% |
| NICU admission | 56 | 43% |
| not required NICU admission | 56 | 43% |

## DISCUSSION

As with pre-eclampsia, the pathogenesis of eclampsia remains largely unknown and 5%–8% of women with pre-eclampsia present this condition in developing countries[7,8]. Preeclamptic women in low/middle income countries are also three times likelier to progress to eclampsia than women in high-income countries[9]. Largely on the basis of clinical data, the incidence of eclampsia ranges between 2% and 10%, depending on the population studied and the definition of eclampsia used[10]; while clinical studies suggest that the proportion of deliveries impacted by eclampsia in Indian women ranges from as low as 0.9% to as high as 7.7%[11,12]. The incidence of eclampsia in India is variable mainly due to lack of a uniform national healthcare policy. Maternal age is considered as a major risk factor, commonly seen at extremes of common reproductive age. We noted significant incidence below 25 years age (71 %). Young age at marriage which is associated with low educational and economic standards and consequently poor antenatal attendance which can be a major confounder. Nulliparity is a well-known risk factor for eclampsia[13]. We also noted similar results. Both educational level and poor ante-natal attendance were identified as risk factors for pre-eclampsia /eclampsia in a world health organisation's secondary analysis in low- and middle-income countries. Similar results were noted in present study[14]. Predisposing factors in LMICs may include poverty, illiteracy, low educational attainment, lack of health awareness, and poor access to antenatal care (ANC) during pregnancy. Previous studies have also found that beliefs about seeking medical advice during pregnancy may also be a factor in some LMICs, and can result in delayed diagnosis and inappropriate treatment of patients with preeclampsia or eclampsia[15] The high incidence of eclampsia seen in our patients is suggestive of poor antenatal services to target population. Majority of cases are unbooked; in such cases the signs and symptoms of preeclampsia remain unrecognised until severe

complications such as eclampsia occur[16]. In our study, only those women were classified as having antepartum eclampsia who were definitely not in labour at the time of admission to hospital. Most cases were antepartum eclampsia. We had 54 % vaginal, 12 % instrumental deliveries and rest were LSCS. Eclampsia per se increases uterine contractility and labour may begin spontaneously shortly after convulsions ensue and progress rapidly[17]. But maternal and fetal outcome is improved when patient is delivered within 12 hours of first convulsion. Care below expectation in the primary healthcare establishment is another disturbing factor as evident from report of National Eclampsia Registry that only 44 % of women had eclampsia prevention with magnesium sulphate before admission to hospital[18]. Experience has shown that rate of eclampsia can be reduced with use of prophylactic magnesium sulphate. Findings of the Magpie Trial revealed that in women with eminent eclampsia the number of women to be treated to prevent one case of eclampsia was 36, and in those without symptoms the number of women to be treated to prevent one eclampsia was 129[19]. In hypertensive disorders of pregnancy, the initial signs and symptoms are dictated by the site and extent of endothelial cell damage. Ideally hypertension should be followed by convulsions, as sign of increasing disease severity. But practically, many a times convulsions may precede hypertension or proteinuria, i.e. the term preeclampsia is misleading because eclampsia can precede preeclampsia. Hence, to achieve further reductions in the incidence of eclampsia, new screening and diagnostic tools should be developed other than features of hypertension and proteinuria. This can seriously help to reduce maternal and perinatal mortality and morbidity due to eclampsia.

## CONCLUSION

Eclampsia prediction is difficult but still majority of cases can be easily prevented by education to girls, adequate and proper antenatal check-ups. These simple measures increases pre-eclapmsia diagnosis and thus eclampsia. Early MgSO4 also plays a significant role in preventing maternal and neonatal mortality and morbidity

## REFERENCES


1. Duley L. The global impact of pre-eclampsia and eclampsia. Seminars in perinatology. 2009; 33(3):130–7.
2. Lozano R, Wang H, Foreman KJ, Rajaratnam JK, Naghavi M, Marcus JR, *et al*. Progress towards Millennium Development Goals 4 and 5 on maternal and child mortality: an updated systematic analysis. Lancet. 2011; 378(9797): 1139–65.
3. Thornton C, Dahlen H, Korda A, *et al*: The incidence of preeclampsia and eclampsia and associated maternal mortality in Australia from population-linked datasets: 2000–2008. Am J ObstetGynecol 208(6):476.e1, 2013
4. Ludmir J, Vigil-De Gracia P, Mag-Pip (Magnesium postpartum in preeclampsia) study group: Is magnesium sulfate use of benefit postpartum? A randomized controlled trial. Abstract No. 4, Am J ObstetGynecol 216:S3, 2017
5. Singh S, Behera A. Eclampsia in eastern India: incidence, demographic profile and response to three different anticonvulsant regimes of magnesium sulphate. Int J GynecolObstet 2010; 15(2):1–7.
6. Coghill AE, Hansen S, Littman AJ. Risk factors for eclampsia: a population-based study in Washington State, 1987–2007. Am J ObstetGynecol 2011; 205(6):553.e1–7.
7. Steegers EA, von Dadelszen P, Duvekot JJ, Pijnenborg R. Pre-eclampsia. *Lancet*, 2010, 21; 376(9741) :631–44.
8. *World Health Organization Multicountry survey on maternal and newborn health.* Geneva,World Health Organization.
9. Dolea C, AbouZahr C. Global burden of hypertensive disorders of pregnancy in the year 2000. In: Global burden of diseases, evidence and information for policy (EIP). Geneva: World Health Organization; 2003.
10. Geographic variation in the incidence of hypertension in pregnancy. World Health Organization International Collaborative Study of Hypertensive Disorders of Pregnancy. Am J ObstGynecol 1988; 158(1):80–3.
11. Singh S, Behera A. Eclampsia in eastern India: incidence, demographic profile and response to three different anticonvulsant regimes of magnesium sulphate. Int J GynecolObstet 2010; 15(2):1–7.
12. Abalos E, Cuesta C, Grosso AL, Chou D, Say L. Global and regional estimates of preeclampsia and eclampsia: a systematic review. Eur J ObstetGynecolReprodBiol 2013; 170(1):1–7.
13. Duckitt K, Harrington D. Risk factors for pre-eclampsia at antenatal booking: systematic review of controlled studies. Bmj. 2005; 330(7491):565.
14. Bilano VL, Ota E, Ganchimeg T, Mori R, Souza JP. Risk factors of preeclampsia/eclampsia and its adverse outcomes in low- and middle-income countries: a WHO secondary analysis. PloS one. 2014; 9(3):e91198.
15. Ghulmiyyah L, Sibai B. Maternal mortality from preeclampsia/eclampsia. SeminPerinatol 2012; 36(1):56–9.
16. Sardesai SS, Maira S, Patel A, Patel U. Low dose magnesium sulphate therapy for eclampsia and imminent eclampsia: regime tailored for Indian women. J ObstetGynaecol Ind 2003; 53:546-550
17. Ollatunji AO, SuleOdu AO. Maternal mortality from eclampsia. J ObstetGynaecol 2006;26:542-543
18. Gupta S, Wagh G. Preeclampsia. J ObstetGynecol India. 2014; 64:1.
19. The Magpie Trial collaborative Group. Do women with preeclampsia and their babies benefit from magnesium sulphate. The Magpie Trial: a randomized placebo controlled trial. Lancet. 2002; 359: 1877–90.


Source of Support: None Declared
Conflict of Interest: None Declared