

An Observational Study to Assess the Factors Associated with Maternal Mortality in Eclamptic Patients in a Tertiary Care Centre in U.P, India

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ABSTRACT

Introduction: Hypertensive disorders of pregnancy, HDP, affect 10% of pregnancies worldwide, being one of the greatest and the most challenging causes of maternal mortality. Study aimed to identify the contributing factors in maternal mortality associated with eclamptic patients.

Material and methods: This was a retrospective study of maternal deaths in eclamptic patients recorded over 6 years (January 2014 to December 2019). Records of these patients were checked pertaining to their social and clinical findings. The records were analyzed using SPSS version 25. The Chi square test was used for test of significance.

Results: In the 6 years, from January 2014 to December 2019, total maternal deaths were 137. Out of these, 13 were patients of eclampsia. Mostly primigravida were affected but deaths were more common in primipara. Antepartum eclampsia was present in 66% patients and mortality was 69.2% whereas 33% patient had postpartum eclampsia and mortality 30.8%. Unbooked patients were 68% and constituted 3/4th of mortality. Most patients of eclampsia presented with pulmonary edema but deaths were more common where more than one system was involved. Almost all eclamptic patients has leukocytosis and albuminuria, two-third had hypocalcaemia. Abnormal prothrombin time, thrombocytopenia, LFT and KFT was found in 25%, 10%, 10% and 10% of patients respectively. In the patients who died, most had leukocytosis, albuminuria and hypocalcemia, half of these patients had thrombocytopenia & abnormal liver function test.

Conclusion: Low socioeconomic status, unbooked status and poor transport facility are important social factors which can be corrected by better ANC provision and improvised infrastructure.

Keywords: Maternal Mortality, Eclamptic Patients

INTRODUCTION

According to National High Blood Pressure Education Program Working Group (NHBPEP) and the American College of Obstetrician and Gynecologists (ACOG), hypertension in pregnancy is defined as:

1. Systolic blood pressure of 140 mmHg or higher and/or
2. Diastolic blood pressure of 90 mmHg or higher (Korotkoff V). These measurements have to be confirmed on at least two occasions 4 to 6 hours apart but within a maximum of a week period.

Task Force of the American College of Obstetricians and Gynecologists (2013) has classified hypertensive disorders of pregnancy in four types:

1. Preeclampsia and eclampsia syndrome
2. Chronic hypertension of any etiology
3. Preeclampsia superimposed on chronic hypertension
4. Gestational hypertension—definitive evidence for the preeclampsia syndrome does not develop and hypertension resolves by 12 weeks postpartum.

For every pre-eclampsia related death, there are multitudes of other women who experience near miss significant maternal morbidity. Eclampsia is the convulsive phase of the disorder and is among the more severe manifestations of the disease. Maternal mortality is found in 1% of eclampsia patient¹. Both classical risk factor and local factors are associated with mortality. This study was undertaken to reduce maternal mortality by specifically identifying the contributing factors at a tertiary care center in U.P.

Study aimed to identify the contributing factors in maternal mortality associated with eclamptic patients.

MATERIAL AND METHODS

This was a retrospective study of maternal deaths in eclamptic patients recorded by the Department of Gynecology and Obstetrics, Rohilkhand Medical College and Hospital, Bareilly, Uttar Pradesh, India for a period of 6 years from January 2014 to December 2019. Out of total 137 maternal death, 13 patients were of eclampsia. Information pertaining to their age, parity, booking status, gestational age at delivery,

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and type of eclampsia were also obtained. In the study period all eclampsia cases treated with magnesium sulphate. Records of these patients were checked pertaining to their social and clinical findings. The records were analyzed using SPSS version 25. The Chi square test was used for test of significance.

Exclusion criteria: The pregnant women with known seizure disorder were excluded from our study

RESULT

This was a retrospective study conducted from January 2014 to December 2019 in Rohilkhand Medical College & Hospital which is a tertiary medical center. There were 20708 live births, total birth was 23708 and total maternal deaths were 137. Maternal mortality ratio was 661 per 100,000 birth. Out of these 137 deaths, 13 were in patients of eclampsia.

Table 1 shows in this period of 6 years, there were 752 patients of eclampsia. The incidence of eclampsia was 3.17% and Case Fatality Rate was 1.73

Table 2 shows characteristics of 752 patients of eclampsia according to age, parity and gravida. Out of 752 patients, 71.8% of patients were in age group 20 to 30 years (p value - 0.94 which was insignificant). 57.1% of the affected patients were primigravida. Out of 752 patients of eclampsia, 66% patients had antepartum eclampsia and 33% patient had postpartum eclampsia. Most of the patients were in income group 40,000-60,000 per annum. Most of the patients were in severe GCS group. Most of the patients with eclampsia presented with pulmonary edema.

Table 3 shows percentage of patients with deranged lab profile. Almost all eclamptic patients has leukocytosis ($>11,000/\text{mm}^3$) and albuminuria, 2/3rd had hypocalcemia ($<8.5\text{mg/dl}$). Liver

function test was abnormal in 10% of patients. Prothrombin time was abnormal in 25% of patients. Thrombocytopenia and KFT was 10% of patients. 68% of the patients were unbooked and constituted 3/4th of mortality. 77% of the deaths were in the age group 20-30 years and the deaths were more common in primipara.

There were 69.2% mortality in patients with antepartum eclampsia and 30.8% mortality in patients with postpartum eclampsia. Most of the deaths were in income group 40K-60K and deaths were more common in patients of eclampsia, where more than one system was involved. Deaths were equally present in all GCS group.

In the patients who died, most had leukocytosis, albuminuria and hypocalcemia, half of these patients had thrombocytopenia & abnormal liver function test. 20% of them, also had Widal positive, eosinophilia & cerebral hemorrhage on CT scan. Majority of these patients died antenatally. Patients who arrived after 24 hours of first seizure episode had poorer prognosis. Out of patients who survived 75% went home in good condition, rest went against doctor's advice.

DISCUSSION

Eclampsia is a serious complication of hypertensive disorder in pregnancy. Eclampsia is defined as occurrence of convulsion or coma or both not caused by any coincidental neurologic disease such as epilepsy in a woman whose condition also meets the criteria of preeclampsia.

In a span of 6 years from January 2014-December 2019 in our college we have 752 patients of eclampsia and total birth during that period were 23708. Incidence of eclampsia in our study was 3.17%. In India, incidence of eclampsia is variable^{2,3}. In our study maternal mortality was 137, out of which 13 were in patients of eclampsia. Therefore, case

Total no. of deliveries	Total cases of eclampsia	Incidence of eclampsia	Mortality due to Eclampsia	CFR
23708	752	3.17%	13	1.73%

Table-1: The following table shows Incidence of eclampsia and case fatality rate

Age group	No. of patients	No. of primipara	No. of Multigravida
≤20 years	98	96	2
20 – 30 years	540	430	110
>30 years	114	24	90
Total	752	550	202

Table-2: The following table shows characteristics of 752 patients of eclampsia according to age, parity and gravida

Number of patients with leukocytosis	92%
Number of patients with albuminuria	99%
Number of patients with hypocalcemia	66%
Number of patients with deranged coagulation profile	25%
Number of patients with deranged KFT	10%
Number of patients with deranged LFT	10%
Number of patients with WIDAL positive	20%
Number of patients with thrombocytopenia	10%

Table-3: Percentage of patients with deranged lab profile

fatality rate was 1.73%. Different studies give a fatality rate (0.38% -7.8%)^{4,5,6,7,8} in India. In Africa, CFR is 10.7%⁹. Most patients were in age group 20-30 years, deaths were also common in this group. South Indian study showed 57.1% death in age group 21-25¹⁷ whereas 76% death in 20-29²¹ years and 24% death were in >30 years. Mostly primigravida were having eclampsia but deaths were more common in primipara. All studies showed more mortality in primipara^{13,17,22} including African studies which showed 42.5% mortality in primipara.²³ Eclampsia was almost exclusively found in unbooked patients and these patients had higher incidence of mortality. Majority were unbooked as sign and symptoms of pre-eclampsia remain unrecognized until severe complications occur.^{4,20,24,25,26} Mostly deaths occurred in patients who suffered from antenatal eclampsia. Patients were in 40,000-60,000 per annum group and deaths were also more common same as Sarkar¹³, Adame²⁰. Majority of these people remained undelivered. People who lived presented within 24 hours of first seizure episode but people who died came at various time intervals. People who stayed far died more.

Unlike Moore, Munoz¹⁴, Smita Tyagi¹⁷ Mortality was more when they reached late, cause of death was pulmonary edema, sepsis & disseminated intravascular coagulopathy. According to Sawhney⁸ & Moodley¹⁸ & Tuffnel¹¹ leading cause of death was cerebral complications while Nigerian study¹², important cause was acute renal failure, disseminated intravascular coagulopathy, cardiac arrest, Pulmonary edema & cardiovascular accident. Recent study by Sarkar¹³ in 2013 quoted pulmonary edema as the commonest factor.

In our study, most patients were in severe GCS group, but mortality was spaced out in moderate, severe & very severe GCS group as compared to Munoz¹⁴ & muzzaffanagar¹⁵ study. Most patients of eclampsia presented with pulmonary edema but deaths were more common where more than on system was involved. 9% of patients had heart failure & PE^{4,13,16,17}. Acute renal failure, disseminated intravascular prognosis, Pulmonary edema and cardiovascular accident were main causes of Maternal mortality¹². ICU admission was associated with grave prognosis. All deceased patients had albuminuria & leukocytosis, 2/3rd had hypocalcemia. LFT was abnormal only in 10% of patient but PT was abnormal in 25%. Thrombocytopenia, Abnormal KFT in 10% patients. 20% had widal positive, eosinophilia & cerebral hemorrhage on CT scan. Cameroon¹⁸ related high Creatinine level to mortality. Lgberase¹² linked acute kidney disease and disseminated intravascular coagulopathy with higher mortality. In other Indian studies⁴ liver, renal failure associated in majority. Sibai¹⁹ associated HELLP with mortality same as Adama²⁰.

CONCLUSION

Eclampsia and Pre-eclampsia constitute an important cause of maternal mortality. Various socioeconomic, clinical and treatment criterias are associated with the outcome of patients. Low socioeconomic status, unbooked status and poor transport facility are important social factors which

can be corrected by better ANC provision and improvised infrastructure. Clinical factors like level of consciousness and pulmonary edema are important prognostic factors. Deranged coagulation, renal and liver profile especially HELLP syndrome is also associated with poorer prognosis.

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