

## A hospital based cross sectional study of critical care management of eclampsia patients in a tertiary care hospital

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### Abstract

**Introduction:** Preeclampsia is a pregnancy specific hypertensive syndrome associated with significant morbidity and mortality in mother and baby. Preeclampsia-eclampsia needs intensive care antepartum, intrapartum as well as postpartum for successful pregnancy outcome. Preeclampsia leads to multiorgan system involvement if appropriate timing of delivery is delayed. **Materials and Methods:** The present study was a hospital based cross sectional study done in the Department of Obstetrics and Gynecology, Mahatma Gandhi Memorial Medical College and Hospital Jamshedpur, Jharkhand over a period of one year from January 2020 to December 2020. For each eligible patients for the study, information in socio-demographic characteristics (age, parity, booking/referral status, marital status, educational status and place of delivery), gestational age at the time of identification of complications, indication for ICU admission and timing of admission to ICU (antepartum or postpartum) were collected on a data collection sheet. **Results:** During the study period, there were a total of 9907 obstetric admission and 7365 live births. Out of 174 eclampsia patients, 72 patients were admitted to the obstetric ICU, giving an ICU admission rate of 4.8/1000 live births. The mean maternal age of the patients was 25.4+5.8 years (range 18-29 years). Out of 72 patients, 30 patients (41.3%) were nulliparous and 60.5% were uneducated. A total 1.97% (3 patients) were booked and 98.03% (69 patients) were unbooked referred emergencies. The average duration of ICU stay was 5.4+3.1 days. **Conclusion:** Early referral of eclampsia patients or at risk patients to a tertiary care centre may help to reduce maternal morbidity and mortality. Early diagnosis and prompt treatment through a multidisciplinary team in an ICU setting can prevent complications and reduce morbidity and mortality.

**Key Words:** Preeclampsia, ICU, antepartum, Intrapartum.

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### Introduction

Preeclampsia is a pregnancy specific hypertensive syndrome associated with significant morbidity and mortality in mother and baby[1]. Preeclampsia-eclampsia needs intensive care antepartum, intrapartum as well as postpartum for successful pregnancy outcome. Preeclampsia leads to multiorgan system involvement if appropriate timing of delivery is delayed[2]. The maternal morbidity reduction is not in number alone but a decrease in postpartum ailing period. The resultant maternal morbidity may extend lifelong in some patients [3]. Primary prevention of preeclampsia has not yet been possible therefore it is important to prevent and detect the complications occurring secondary to preeclampsia-eclampsia. This requires an intensive critical care monitoring[4]. Therefore the emphasis should be on the critical care involved and needs to be given in patients with preeclampsia to have a good pregnancy outcome i.e. not just decreasing the perinatal morbidity and mortality or just maternal mortality but in terms of reduced maternal morbidity[5].

The primary aim of the present study is to provide a comprehensive review of the management and outcome of critically ill eclampsia patients in the obstetric intensive care unit (ICU) of department of obstetrics and gynaecology, Mahatma Gandhi Memorial Medical College and Hospital Jamshedpur, Jharkhand.

### Materials and methods

#### Study design

A hospital based cross sectional study.

#### Study Location

Department of Obstetrics and Gynecology, Mahatma Gandhi Memorial Medical College and Hospital Jamshedpur, Jharkhand

#### Study Duration

January 2020 to December 2020.

The present study was a hospital based cross sectional study done in the Department of Obstetrics and Gynecology, Mahatma Gandhi Memorial Medical College and Hospital Jamshedpur, Jharkhand over a period of one year from January 2020 to December 2020.

#### Inclusion criteria

All critically ill eclampsia patients admitted in obstetric ICU according to ICU admission criteria.

#### Exclusion criteria

Other eclampsia patients admitted in eclampsia room of the department of obstetrics and gynaecology with no critical illness/complications.

For each eligible patients for the study, information in socio-demographic characteristics (age, parity, booking/referral status, marital status, educational status and place of delivery), gestational age at the time of identification of complications, indication for ICU admission and timing of admission to ICU (antepartum or postpartum) were collected on a data collection sheet. Data on ICU

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admission (duration of stay, therapeutic interventions during ICU admission and maternal outcome - mortality or transferred out of the unit) were also documented. Therapeutic interventions of the interest in the ICU included oxygen inhalation, oxymetry, advanced

monitoring, mechanical ventilation, use of vasoactive drugs and blood/component transfusion. The outcome of interest were mortality, transfer out of the unit to the ward and transfer to other department of our hospital.

## Results

**Table 1: Sociodemographic Characteristics**

Characteristics	Frequency
Age (years)	25.4 ±5.3
Parity	
Nullipora	30 (41.3)
1-3	34 (44.8)
>4	10 (13.7)
Antenatal care	
Booked/unbooked	3/69
Gestational age	
Preterm/term	38/34
Mode of delivery	
Emergency C/S	12
VD	49
Length of ICU stay (days)	5.4±3.1

During the study period, there were a total of 9907 obstetric admission and 7365 live births. Out of 174 eclampsia patients, 72 patients were admitted to the obstetric ICU, giving an ICU admission rate of 4.8/1000 live births.

The mean maternal age of the patients was 25.4+5.8 years (range 18-29 years). Out of 72 patients, 30 patients (41.3%) were nulliparous and 60.5% were uneducated. A total 1.97% (3 patients) was booked and 98.03% (69 patients) were unbooked referred emergencies.

The average duration of ICU stay was 5.4+3.1 days.

Out of 72 critically ill eclampsia patients, 72% (52 patients) had antepartum eclampsia, 17% (13 patients) had postpartum eclampsia and 11% (9 patients) presented with intrapartum eclampsia.

Table 3 shows the major interventions in the ICU to be advanced monitoring, blood/component transfusion, mechanical ventilation, use of vasoactive drugs and renal dialysis.

Most of the patients were admitted for mechanical ventilation (41%) or advanced monitoring (90%). Other interventions included renal dialysis (11.3%), blood/component transfusions (53.7%) and use of vasoactive drugs (48.7%).

**Table 2: Distribution according to onset of eclampsia**

S.No	onset of eclampsia	Percentage
1	Antepartum Eclampsia	72%
2	Intrapartum Eclampsia	11%
3	Postpartum Eclampsia	17%

**Table 3: Interventions in the ICU**

Intervention	Frequency (%)
Mechanical Ventilation	30 (41)
Advanced Monitoring	66 (90)
Vasoactive Drugs	29 (40.6)
Blood/Component Transfusions	39 (53.7)
Renal analysis	8 (11.03)

**Table 4: Maternal complications in eclampsia**

Complications (N=72)	Frequency (%)
Pulmonary Edema	29 (40)
CVA	21 (28.9)
Acute Kidney injury	9 (12.4)
HELLP	8 (11.7)
Pulmonary embolism	8 (11.7)
MODS	2 (2.7)
Aspiration Pneumonitis	1 (1.3)
Deaths	13 (17.93)

**Table 5: Causes of Maternal Mortality (N=13)**

S.No	Causes of Maternal Mortality	Number
1	CVA	3
2	Pulmonary Edema	3
3	Pulmonary Embolism	2
4	AKI	1
5	CCF	1
6	MODS	1
7	Aspiration Pneumonia	1

Most common cause of maternal death was CVA in 3 cases (21%), pulmonary oedema in 3 cases (23%), pulmonary embolism in 2 cases (15.3%), CCF in 1 case (7.6%), AKI in 1 case (7.6%) and 1 death (7.6%) was due to multi organ failure.

**Discussion**

This study shows that the pulmonary edema and CVA were the leading causes for admission to the ICU in women with eclampsia and mortality is very likely if pulmonary edema complicates eclampsia. There is a plethora of evidence on the outcome of women with eclampsia [6]. Most of these studies identified several factors as being responsible for the maternal mortality and morbidity following eclampsia[7]. Over a third of the women were nulliparous in our study. Pre eclampsia and eclampsia is thought to be a disease of the young and low parity. Several studies in Nigeria and elsewhere indicates that 39-44% of women with eclampsia are nulliparous and similar to our observation [8]. The relative preponderance of the disease in nulliparous women implies a higher representation in the associated mortality. Inotropic support was required in 18.54% cases in our study. Author from other parts of the world also observed that hemodynamic and respiratory complications needing inotropic or ventilatory support remain the most common reasons for ICU admission and the need for support may predict poor outcome.

In our study, 21 eclampsia patients (28.9%) had CVA. Among women with stroke during pregnancy, pre eclampsia/eclampsia is an important risk factor for both ischemic and haemorrhagic stroke. In a French case series of 31 women with stroke during pregnancy, about half (n=15) were ischemic, with eclampsia accounting for 6 cases (47%). Of those with haemorrhagic strokes, 7 cases (44%) had eclampsia, in addition to HELLP syndrome or disseminated intravascular coagulation [9]. In present study, 8 patients (11.7%) had HELLP syndrome. HELLP syndrome is associated with a maternal mortality of 3.5%-24.2%. The maternal mortality associated with HELLP syndrome is mainly due to renal failure, coagulopathy i.e. disseminated intravascular coagulation (DIC), pulmonary edema, cerebral edema, abruptio placentae, hepatic haemorrhage and hypovolemic shock [10].

There are limitations to the interpretation of our results. In this study, only patients admitted to the ICU were studied. There may have been some patients with eclampsia who did not come to the ICU and were missed out.

**Conclusion**

This study to determine the outcome of women with eclampsia admitted to the obstetric ICU showed that primiparity, unbooked status and cesarean delivery were associated factors for ICU admission. Furthermore, women who developed complications like pulmonary edema, CVA, HELLP syndrome, AKI, Pulmonary embolism etc. in the course of treatment had poor outcome.

When complication arises, early intervention and treatment on a multidisciplinary basis which may involve ICU admission for ventilator support, invasive monitoring and vasoactive drug infusions, can alleviate progression of organ dysfunction and improve prognosis. Establishment of a dedicated obstetric ICU at tertiary care centre with knowledge familiarity, experience and expertise of an obstetrician and a special team would be best place to monitor and treat the critically ill eclampsia patients who will reduce the maternal morbidity and mortality.

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