



Obstetric management of eclampsia– A clinical study in Chittagong medical college and hospital (CMCH)

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Abstract

Eclampsia continues to be a major cause of maternal and perinatal mortality in developing countries. Early identification and management of pre-eclampsia will help reduce the mortality due to eclampsia. The study aims to determine the outcome of obstetric management of eclampsia. It was a cross sectional observational study conducted between July 2019 and December 2019 in the Department of Obstetrics and Gynaecology, Chittagong Medical College and Hospital (CMCH), Chattogram, Bangladesh with an aim to evaluate the socio-demographic profile of eclamptic patients, determine the maternal and foetal mortality and morbidity in vaginal delivery with compared to that of caesarean delivery as well as to compare the outcomes of labour in patients with eclampsia. The study population was eclampsia with singleton pregnancy presenting during study period. Patients who had no other obstetric indication of caesarean section were allowed for vaginal delivery. Labour was monitored carefully. A total of 53 eclamptic patients underwent caesarean section and remaining 47% was delivered vaginally. There was not a significant difference in maternal and fetal outcome in both groups with a perinatal mortality 20.8% vs. 14.9% and maternal mortality 3.8% vs. 4.3% in caesarean section and vaginal delivery group respectively.

Keywords: eclampsia, maternal mortality, perinatal outcome, proteinuria

Introduction

Eclampsia is the occurrence of convulsion associated with pregnancy complicated by pre-eclampsia [1]. Pre-eclampsia is a multisystem disorder of unknown aetiology characterized by development of hypertension to the extent of 140/90 mm Hg or more with proteinuria after 20th week of gestation in a previously normotensive and non-proteinuric patient. The pre-eclamptic features may appear even before the 20th week as in cases of hydatidiform mole and acute polyhydramnios [2]. Pre-eclampsia is a syndrome of two distinct disease types; it may be purely idiopathic, restricted to and caused by pregnancy, or it may be due to an underlying hypertensive disorder. Eclampsia is a life threatening complication of pregnancy that typically viewed as the end stage of pre-eclampsia. Pre-eclampsia in pregnancy describes as a condition where women have excess levels of protein in urine, and where they have high blood pressure [3, 4]. Other symptoms like a lower platelet count and swelling (oedema) may be present too. Though symptoms may be managed to a degree, the condition can't be cured by anything but childbirth, and in about 1% of women eclampsia develops, which can cause violent seizures and coma, and which causes maternal and fetal death in some instances. [http://www.wisegeek.com/what-iseclampsia.html]. Eclampsia remains one of the major causes of maternal mortality. The maternal mortality rate is as high as 14.0% in developing countries [5]. In India maternal mortality rate in eclampsia ranges from 8 – 14% [6, 7]. In Bangladesh maternal mortality rate in eclampsia is

24% [8]. In addition, there may be severe maternal morbidity associated with eclampsia including cerebral hemorrhages, cortical blindness, renal failure, disseminated intravascular coagulopathy, HELLP syndrome and psychosis. In UK, Europe and USA, eclampsia occurs in 1 in 2,000 deliveries. Rate is much higher in developing countries i.e., 1 in 100 to 1700 deliveries. In India, its incidence is reported to be 220/10,000 and in Pakistan it is 120/10,000 deliveries [9]. Eclampsia is often insidious in onset and is usually, although not always, preceded by severe pre-eclampsia. Prevention of eclampsia may be achieved by preventing severe pre-eclampsia and by active management of impending eclampsia [10]. The only cure for eclampsia is delivery of the baby and with it the placenta, which is the seat of the problem. It is likely that eclampsia will prevail until the etiology and treatment directed to this etiology, is found [11]. The identification of associated factors of pre-eclampsia and eclampsia, more intensive monitoring by relevant levels of staff, and standardized protocols for treatment instituted promptly will lead to better management of severe pre-eclampsia and eclampsia. To achieve improvement in prevention and management of the diseases, all cases occurring in the country should be reviewed regularly to provide an analysis and overview of management.

Materials and Methods

It was a cross sectional observational study conducted between July 2019 and December 2019 in the Department

of Obstetrics and Gynaecology, Chittagong Medical College and Hospital (CMCH), Chattogram, Bangladesh. Study population was selected after fulfilling the inclusion and exclusion criteria.

To observe outcome (survival rate) sample size was determined by using following formula:

$$n = \frac{z^2(p \times q)}{d^2}$$

Where,

n = Sample size

p = Proportion in the target population estimated to have particular character.

Statistics of 2010 in DMCH reveals the incidence of eclampsia in 8.0 percent

$$q = 1 - p$$

z = Standard normal deviation (Usually assumed at 1.96 or 2, which corresponds to 95% confident limit)

d = Degree of accuracy

Thus,

$$n = \frac{1.96^2(0.08 \times 0.92)}{(0.05)^2}$$

$$= 113.09$$

$$= 113$$

The study duration was only 6 months. So the targeted sample size could not be collected during this study duration, therefore 100 eclampsia patients was taken in this study. Eclampsia patients were recruited for the study purposively.

Pregnant women with eclampsia admitted for delivery in Department of Obstetrics and Gynecology in Chittagong Medical College and Hospital be asked for proper history. Data was collected by face-to-face interview by using a predesigned questionnaire. This is a study of pregnancy outcomes of eclampsia patients. Eclampsia was defined as the occurrence of seizures in the presence of preeclampsia (shown by hypertension diastolic blood pressure of at least 90 mmHg, proteinuria one “plus” or at least 0.3g/24 h occurring after 20 weeks gestation). Patients with any cause for convulsion other than eclampsia were excluded. A specially designed questionnaire was used to record the relevant data of each patient. It contain the demographic variables such as age, socioeconomic status, gestational age at presentation, time of onset of eclampsia, duration and frequency of seizures, mode of delivery, maternal and paternal outcome. All the patients taken in this study was admitted in the hospital (in patients) both in wards and in emergency rooms. All the patients included in the study was evaluated by detailed history, through physical examination and relevant laboratory investigations like blood complete

picture, platelet count, coagulation profile, renal function tests, serum electrolytes, uric acid, blood glucose level and urine protein examination.

Statistical Analysis

Statistical analysis was carried out by using the Statistical Package for Social Sciences version 16.0 for windows (SPSS Inc., Chicago, Illinois, USA). The quantitative observations were indicated by frequencies and percentages. Chi-Square test with Yates correction was used to analyze the categorical variables, shown with cross tabulation. Student t-test was used for continuous variables. P values <0.05 was considered as statistically significant.

Rationale

Eclampsia is a serious complication of pregnancy; it remains a frequent condition in our context. Eclampsia is potentially fatal disorder of pregnancy with a significant maternal and fetal morbidity and mortality rate. A study was done to measure the incidence of eclampsia, its risk factors associated with adverse maternal outcome and to identify its most common presentations in their practice [12]. Pregnancies complicated by eclampsia are purveyors of high maternal morbidity and mortality. Prevention of eclampsia may be achieved by preventing severe pre eclampsia and by active management of impending eclampsia. Therefore, this study designed to find out the maternal and fetal outcome of patients with eclampsia in our country.

Ethical Implications

The aims and objectives of the study along with its procedure, alternative diagnostic methods, risk and benefits was explained to the patients in easily understandable local language and then informed consent was taken from each patient. It was assured that all records would be kept confidential and the procedure was helpful for both the physician and patients in making rational approach regarding management of the case.

Results

Table 1: Hospital incidence of eclampsia patients during study period (total admitted patients 9315)

Parameters	Number of Patients	Percentage
Total Number of Obstetric Patients	7022	75.4% of total admission
Total Number of Eclampsia Patients (antepartum, intrapartum & postpartum)	450	4.8% of total admission
Number of Study Population	100	1.1% of total admission

Incidence of eclampsia was 4.8% of total admission.

Table 2: Demographic profile of the study population (n=100).

Parameter	Vaginal Delivery (n=47)		Caesarean Section (n=53)		P value
	N	%	N	%	
Age (in year)					0.570 ^{ns}
< 20	25	53.2	27	50.9	
20 – 30	17	36.2	23	43.4	
30+	5	10.6	3	5.7	0.471 ^{ns}
Parity (in number)					
0	23	48.9	25	47.2	
1	19	40.4	19	35.8	
2	3	6.4	4	7.5	

3	1	2.1	5	9.4	
4	1	2.1	0	0.0	
Occupational Status					
Housewife	38	80.9	39	73.6	0.689 ^{ns}
Garment Worker	7	14.9	11	20.8	
Service Holder	2	4.3	3	5.7	
Educational Status					
Illiterate	26	55.3	31	58.5	0.338 ^{ns}
Primary	18	38.3	14	26.4	
Secondary	2	4.3	7	13.2	
Higher Secondary	1	2.1	1	1.9	

There was not a significant difference in maternal age, parity, occupational and educational status in obstetric management of eclamptic patient (p>0.05).

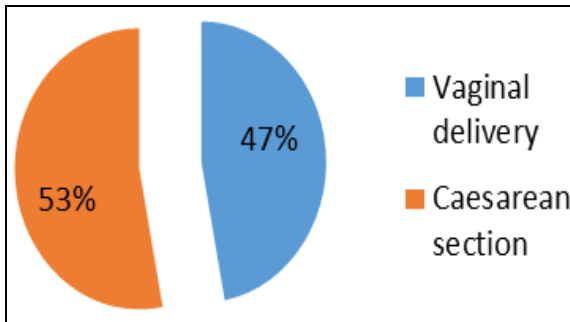


Fig 1: Distribution of the study patients according to mode of delivery (n=100).

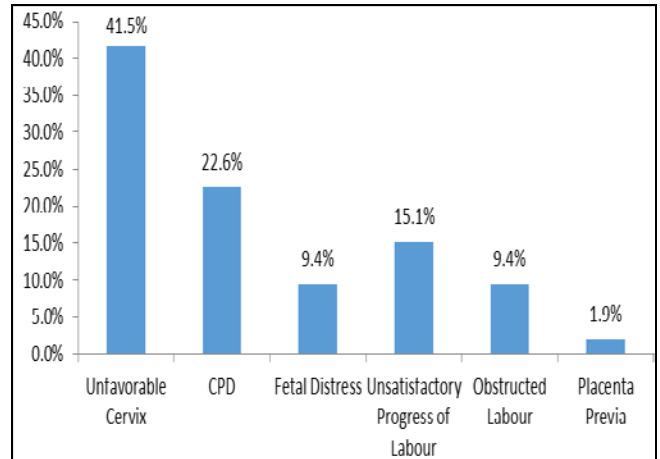


Fig 2: Indication for Caesarean section (n=53).

Pie chart shows that 47% patients were delivered vaginally and 53% were delivered by caesarean section.

Bar diagram shows that unfavorable cervix was the most common indication of caesarean section followed by CPD.

Table 3: Maternal complications of study population (n=100).

Maternal Complication	Vaginal Delivery (n=47)		Caesarean Section (n=53)		P value
	n	%	n	%	
No Complication	28	59.6	36	67.9	0.317 ^{ns}
Pulmonary Oedema	6	12.8	9	17.0	0.439 ^{ns}
Post Partum Haemorrhage	7	14.9	5	9.4	0.564 ^{ns}
Wound Infection	3	6.4	1	1.9	0.317 ^{ns}
Post Partum Psychosis	1	2.1	0	0	0.317 ^{ns}
Death	2	4.3	2	3.8	1.000 ^{ns}

There was no significant difference in maternal complications due to obstetric management of eclampsia (p value >0.05, not significant)

Table 4: Fetal outcome of study population (n=100).

Mode of Delivery	Vaginal Delivery (n=47)		Caesarean Section (n=53)		P value
	N	%	n	%	
Perinatal Death (n=18)	7	14.9	11	20.8	0.446 ^{ns}
Healthy Baby (n=82)	40	85.1	42	79.2	

There was no significant difference between the fetal outcome of normal vaginal delivery and caesarean section (p value >0.05, not significant).

Table 5: Comparison of fetal outcome according to mode of delivery (n=100).

Fetal Outcome	Vaginal Delivery (n=47)		Caesarean Section (n=53)		P value
	n	%	n	%	
Healthy Baby	28	59.6	34	64.2	0.446 ^{ns}
Mildly Asphyxiated and alive	12	25.5	8	15.1	0.371 ^{ns}
Highly Asphyxiated and died	5	10.6	10	18.9	0.197 ^{ns}
Still Born	2	4.3	1	1.9	0.564 ^{ns}

Mode of delivery does not influence the fetal outcome of eclamptic patient (p value >0.05, not significant).

Table 6: Comparison between fetal outcome with the severity of proteinuria (n=100).

Severity	Proteinuria ($\leq 3\text{gm}/24\text{h}$) (n=39)		Proteinuria ($> 3\text{gm}/24\text{h}$) (n=61)		P value
	n	%	n	%	
Perinatal Death	2	5.1	16	26.2	0.007 ^s
Healthy Baby	37	94.9	45	73.8	

Proteinuria plays a significant role in fetal outcome of eclamptic patient (p value <0.05, significant).

Table 7: Comparison between fetal outcome with level of diastolic blood pressure (n=100).

Diastolic BP	Perinatal Death (n=18)		Healthy Baby (n=82)		P value
	n	%	n	%	
$\leq 110\text{ mmHg}$ (n=52)	3	16.7	49	59.8	0.001 ^s
$> 110\text{ mmHg}$ (n=48)	15	83.3	33	40.2	

Diastolic blood pressure is strongly correlated with perinatal outcome in eclamptic patient with a significant p value 0.001(<0.05)

Table 8: Comparison between fetal outcome with time interval between convulsion and admission (n=100).

Time Interval (hour)	Perinatal Death (n=18)		Healthy Baby (n=82)		P value
	n	%	n	%	
$< 12\text{ hours}$ (n=60)	5	27.8	55	67.1	0.002 ^s
$> 12\text{ hours}$ (n=40)	13	72.2	27	32.9	

Time interval between convulsion and admission has influenced significantly in fetal outcome of study population (p value 0.002).

Discussion

Eclampsia is a serious obstetric complication and one of the leading cause of maternal and perinatal mortality in Bangladesh. In spite of different preventive approach to improve obstetric care, it still contributes to 24 percent of maternal mortality in our country [18]. Lack of education, ignorance, poor socioeconomic conditions, social taboo, religion customs etc. are the underlying factors of increasing incidence of eclampsia. Termination of pregnancy is the definitive treatment of eclampsia. Currently trend of delivery in eclamptic patients is caesarean section, if delivery is not anticipated within 6 hours in order to overcome complications related to eclampsia and improve fetomaternal outcome [13]. But caesarean section has its own complications (operative, anaesthetic, postoperative) and has influence on future obstetric outcome.

This cross sectional study was carried out with an aim to evaluate the socio-demographic profile of eclamptic patients, determine the maternal and fetal mortality and morbidity in vaginal delivery with compared to that of caesarean delivery as well as to compare the outcomes of labour in patients with eclampsia. A total number of 100 patients with eclampsia, out of which 47 normal vaginal deliveries and 53 underwent caesarean section in the Department of Obstetrics and Gynecology, Chittagong Medical College and Hospital (CMCH), Chattogram, during the period of July 2019 and December 2019, were enrolled in this study.

The present study findings were discussed and compared with previously published relevant studies. In a study the prevalence of eclampsia was 2.7% [14], where in this current study it was observed during the study periods from July 2019 and December 2019 a total of 9315 patients were admitted, out of which 75.4% were obstetric patients and 4.8% were eclamptic patients. This is higher than other studies reported from other parts [15, 16]. However, the prevalence in developed countries has been falling. The high prevalence in this study could be explained by the fact that the teaching hospital serves as a referral centre to the surroundings maternity homes; which populate the area and

a few hospitals, none of which is manned by an obstetrician. Also the poor utilization of adequate antenatal care service in this population as exemplified by the significantly higher percentage of patient not received antenatal check up could contribute to the higher incidence of eclampsia in this study. (Table-1)

In this current study it was observed that more than a half (53.2% vs. 50.9%) of the eclamptic patients was in 2nd decade in both groups. Primigravida was predominant in both groups, where 48.9% and 47.2% in group I and group II respectively. Education income and occupation have a significant influence on the quality of patients' nutrition and antenatal care. In this present study it was observed that more than seventy percent of the patients were housewife in both groups, only 14.9% were garment worker in the vaginal delivery group and 20.8% were the caesarean section group. 4.3% service holders were in the vaginal delivery group and 5.7% in the caesarean section group. Majority of the patients were illiterate or primary level pass in both groups. These results are comparable with other results [17, 18, 19]. (Table-2)

In this current series, it was observed that eclampsia patients (both antepartum and intrapartum) who had no other obstetrical indication of caesarean section were allowed for vaginal delivery in 47% cases and patients who had definite obstetrical indications underwent caesarean section in 53% cases, none of them underwent caesarean section due to eclampsia alone. A study showed that 36% of eclamptic patients were delivered vaginally, which is lower than the present study [17]. The eclamptic patients who needed immediate caesarean section and whose delivery were imminent were excluded and patients were not selected on the basis of cervical score, they were selected randomly. So induction failure rate was high and incidence of vaginal delivery was relatively lower than the current study. Study [17] also showed 64% patients underwent caesarean section which relatively higher than the current study. Another study [19] showed that the incidence of caesarean section was 50.12% due to definite obstetric indications [19]. Another study showed vaginal delivery in eclamptic patients was

52.45% and gestational age near term was the good candidate for induction and was delivered successfully and well recovered [18]. The concept and findings of these studies are consistent with the present study. (Figure-1)

The presence of eclampsia is not an incidence for caesarean delivery. A study showed that the decision to perform caesarean delivery should be based on fetal gestational age, fetal condition, presence of labour and cervical Bishop score. The author recommend caesarean delivery for those with eclampsia before 30 weeks of gestational who are not in labour and whose Bishop score is below 5 [20]. In this current series it was observed that a total of 53 eclamptic patients underwent caesarean section, out of which 41.5% due to unfavourable cervix, 22.6% due to Cephalo-pelvic disproportion (CPD) and 9.4% due to fetal distress. Unsatisfactory progress of labour was the indication in 15.1% cases, obstructed labour and placenta previa were the indications in 9.4% and 1.9% respectively. (Figure-2)

In this study it was observed that 14.9% and 9.4% patients had developed postpartum haemorrhage, in vaginal delivery group and patients, who underwent caesarean section respectively. In vaginal delivery group 12.8% patients had developed pulmonary oedema and 17% in caesarean section group. Wound infection was found 6.4% in vaginal delivery group and 1.9% in caesarean section. The above findings indicate that pulmonary oedema and wound infection rate was apparently higher in caesarean section group than the patient delivered vaginally. Though post partum haemorrhage rate was slightly higher in vaginal delivery group, but not statistically significant. A study showed that acute pulmonary oedema developed more in post operative period than in postnatal periods [21]. It may be due to transient reflex hypertension in eclampsia patient during intubation. Sometimes it may be so extreme as to cause acute pulmonary oedema. Excessive fluid administration in post operative periods may also be responsible and the findings are comparable with the results of the present study. Although eclampsia is associated with an increased risk of maternal death in developed countries 0 – 1.8% [22, 23], where the mortality rate is as high as 14% in developing countries [24, 25]. In this series it was observed that the maternal mortality was 2 (4.3%) and 2 (3.8%) in vaginal delivery group and patients, who underwent caesarean section respectively. In vaginal delivery group, one patient due to post partum haemorrhagic shock and other due to pulmonary oedema. In caesarean section one patient due to anesthetic hazard on operation table and other due to pulmonary oedema. The high maternal mortality reported from the developing countries was noted primarily among patients who had multiple seizures outside the hospital and those without prenatal care [22]. In addition, this high mortality rate could be attributed to the lack of resources and intensive care facilities needed to manage maternal complications from eclampsia [26]. A review of all reported pregnancy-related deaths in the United States for the year 1979–1992 identified 4,024 pregnancy-related deaths. A total of 790 (19.6%) were considered due to preeclampsia-eclampsia, with 49% of these 790 considered related to eclampsia [27]. The authors found that the risk of death from preeclampsia or eclampsia was higher for women older than 30 years and those with no prenatal care. The greatest risk of death was found among women with pregnancies at or before 28 weeks of gestation [28]. (Table-3)

In this current study it was observed that 14.9% and 20.8%

perinatal death were delivered vaginally and caesarean section group respectively. Fetal heart sound was present in both groups during decision. The difference was not statistically significant (> 0.05). So there is no significant difference between the foetal outcome of normal vaginal delivery and caesarean section. Out of 47 eclamptic patients delivered vaginally, fetal heart sound was present in all cases. Among them 59.6% healthy baby, 25.5% mildly asphyxiated and alive after resuscitation, 10.6% highly asphyxiated and died and 4.3% still born. On the other hand, 53 eclampsia patients underwent caesarean section and fetal heart sound was present in all cases. Out of which 64.2% healthy baby, 15.1% mildly asphyxiated and alive after resuscitation, 18.9% highly asphyxiated and died after resuscitation and 1.9% was still born. A study showed that perinatal mortality was 2.48% and perinatal loss was same in both vaginal delivery and caesarean section groups [18]. The investigators showed the responsible factors of perinatal outcome were prematurity, severe proteinuria, high blood pressure, high uric acid level leads to placental insufficiency and IUGR. The perinatal mortality rate was 20.7% [29] and almost equivalent findings also [30], where they reported 21.4% mortality. However, the current study rate was low compared to 40% [31]. The higher rate of perinatal deaths in this study and other similar studies could be explained by the three delays model [32]. Another contributing factor is the limitation in resources for managing highly asphyxiated newborn. This study revealed that the major cases of early neonatal deaths were severe birth asphyxia and low birth weight baby. Three different studies have reported by similar findings [33, 5, 30]. (Table-5, 6)

In the present study, the eclamptic patient who had proteinuria greater than 3 gm/24 hours, diastolic BP greater than 110 mmHg and convulsion-admission interval greater than 12 hours, associated with poor fetal outcome. it was observed that out of 100 eclamptic patients that of 39 had proteinuria less than or equal to 3 gm/24 hours and 61 had proteinuria greater than 3 gm/24 hours and also found perinatal mortality was significantly higher in patients with proteinuria greater than 3 gm/24 hours, where mortality rate was 5.1% and 26.2% respectively. (Table-7)

In the current series it was observed that a total of 52 patients with diastolic BP less than or equal to 110 mmHg, perinatal death was only 16.7% and healthy baby 59.8% in this group. Where the patients with diastolic BP greater than 110 mmHg had significant number of perinatal death, that was 83.3% and healthy baby 40.2%, which indicates that perinatal death is significantly ($p < 0.05$) associated with greater than 110 mmHg diastolic BP. The findings of the current study were found consistent [30], where they showed that fetal wastage was markedly higher in uncontrolled BP, severe proteinuria, high uric acid level and altered liver functions. (Table-7)

In this present series it was observed that a total of 60 eclamptic patients who were brought to hospital less than 12 hours development of convulsion, perinatal mortality was 27.8%, whereas patients who were brought to the hospital more than 12 hours had significant perinatal death, that was 72.2%, which indicates that patients who brought to the hospital more than 12 hours is significantly ($p < 0.05$) associated with perinatal death. (Table-8)

Mode of delivery did not have influence on the maternal and fetal outcome in eclampsia patients if the cases were judiciously selected [13, 17, 18, 19]. On the other hand severity

of disease like high diastolic pressure, massive proteinuria, high uric acid level etc. has significant influence on fetomaternal outcome in eclampsia. The time between first convulsion and start of treatment is also very crucial in eclamptic patient because repeated convulsion process grave influence to the outcome of fetus.

Conclusion

Eclampsia is one of the grave diseases, peculiar of pregnancy, which is still one of the major causes of maternal mortality in Bangladesh. This study was under taken to compare the outcome of labour in vaginal delivery with that of caesarean section in patients presenting with eclampsia. The high rate is due to poor socioeconomic condition, lack of education, inadequate and defective antenatal care and substandard health care services. Termination of pregnancy is the final management of eclampsia and caesarean section rate is high as a method of termination. From this study, it is found that vaginal delivery does not worsen the fetomaternal outcome if the cases are selected judiciously and patients are monitored adequately. On the other hand caesarean section has got its own complications and disadvantages. It is associated with anesthetic hazards, post operative complications, more expensive and imposes extra facilities. Moreover, it has an influence on future obstetric carrier of the women. Vaginal delivery is simple; service is easily available and cost effective. In this study, mode of delivery has not shown any significant difference in maternal and fetal outcome.

Recommendation

The first priority in the management of eclampsia is to prevent maternal injury and to support respiratory and cardiovascular functions. During or immediately after the acute convulsive episode, supportive care should be given to prevent serious maternal injury and aspiration, assess and establish airway potency and ensure maternal oxygenation. During this time, the bed's side rails should be elevated and padded, a padded tongue blade is inserted between the teeth (avoid inducing gag reflex) and physical restraints may be needed. Caesarean section should be done only when obstetrically indicated. Further large study can be carried out to make a definite comment and to develop a national protocol for obstetric management of eclampsia. However, further studies can be undertaken by including large number of patients in multiple tertiary level hospitals.

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