



Original Article

Maternal and Neonatal Outcome after Caesarean and Vaginal Delivery in Eclampsia

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Abstract

This randomized control trial study was conducted at Rajshahi Medical College and Hospital, Bangladesh. This study includes 70 consecutive antepartum eclamptic patients who were admitted in the year 2008. The purpose of this study was to analyze the difference in maternal and perinatal outcome in caesarean and vaginal delivery and thereby describe the success rate of a particular mode of delivery in those cases. Bivariate and multivariable regression analyses were used to determine factors that were associated with assignment to, success of, and odds of maternal and neonatal outcome after caesarean and vaginal delivery.

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Introduction

Eclampsia is defined as seizure activity or coma unrelated to other cerebral conditions in an obstetrical patient with preeclampsia. It is one of the leading causes of maternal and perinatal mortality as well as morbidity throughout the world (Tuffnell et al 2005). Eclamptic seizures occur in the second half of pregnancy and occurrence up to 10 days after delivery had been documented (Ikechebelu & Okoli 2002). While the incidence has been decreasing and its outcome improving in the developed countries (Onuh & Aisien 2004), where special management protocols have been employed (Itam & Ekabua 2001), its incidence is still very high in developing countries. Eclampsia does not develop suddenly in uncomplicated pregnancy rather it evolves as preeclampsia to severe preeclampsia and eclampsia. Often the transition from mild preeclampsia to eclampsia may occur in a short period of time and may appear suddenly. It is

largely a preventable disease with adequate antenatal care.

Pre eclampsia / eclampsia remains the second most common cause of maternal death in the United States (US) and United Kingdom (UK) after thrombo-embolic disease (Rochat et.al 1988)

Eclampsia accounts for 50000 maternal deaths per year worldwide (Duley 1992).

Bangladesh is one of the countries with very high maternal mortality (3.2/1000) rate and eclampsia cause 16% of this death (UNFPA 2007). It is 5 times higher than Sri Lanka & Thailand and 10 times higher than Malaysia (Atrash, 1997).

Pre-eclampsia and eclampsia is a multisystem disease and despite extensive research, no definitive etiology has been identified (Itam & Ekabua 2001). There may be a single recessive trait and also some risk factors such as nulliparity,

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chronic hypertension, multiple pregnancy, diabetes mellitus, hydatidiform mole and fetal hydrops. Further, the condition may correlate with low socioeconomic condition, low protein and calcium in diet (Chesley 1978). Pathogenesis possibly due to cerebral vasospasm with local ischemia, hypertensive encephalopathy, vasogenic edema and endothelial damage (Morriss et.al 1997)

The key of obstetrical management of eclampsia is termination of pregnancy as early as possible and quick delivery can be definitely anticipated by caesarean section. The exact mode of termination of pregnancy is still a matter of debate. Some obstetrician prefers that all cases where the baby is alive should be treated by caesarean section (Chowdhury 1998). Other differs that if the pelvis is adequate, cervix is favorable and the eclamptic fits are controlled, vaginal delivery can be allowed. But the outcome of eclampsia patients not only depended on the termination of pregnancy alone, other factors including interval between the beginning of convulsion and initiation of treatment, state of consciousness of patients in between the fits, long interval between convulsion and termination of pregnancy, very high blood pressure (systolic >200 mm of Hg), high temperature (>102°F), more than 10 fits, presence of pulmonary oedema and oliguria. The most common cause of maternal death in case of eclampsia is pulmonary oedema and acute renal failure caused by abruption placentae. On the other hand, the most common cause of fetal death is prematurely, fetal asphyxia and acidosis (Tuffnell et al 2005).

In Bangladesh, most of the pregnant women do not have the facilities of proper antenatal check-up due to poverty, illiteracy, ignorance and negligence. So identification of risk factors and early detection of preeclampsia is not possible in majority of cases. Rural health centers and Thana health complexes have limited facilities to handle eclampsia cases. So majority of patients come to the tertiary hospital with severe preeclampsia or eclampsia. They need prompt medical as well as obstetrical intervention. In our present set-up,

there is no separate unit for the management of eclampsia patients. Although there is a standard protocol for general management of these patients but obstetrical management depends upon the patient condition and obstetrician's choice. So the outcome varies in different patients.

Material and Methods

This is a randomized control trail study conducted on pregnant women admitted with antepartum eclampsia.

This study was carried out in the obstetrics unit of department of gynae and obstetric, Rajshahi Medical College Hospital from January 2008 to December 2008 for a period of one year. Patients admitted with antepartum eclampsia with gestational age >37weeks were included in the study. They are selected randomly for vaginal delivery and caesarean delivery group.

Results

incidence of eclampsia in pregnancy

During the period of one year, a total of 12176 pregnant women were admitted in the maternity unit of Department of Obstetric and Gynaecology, Rajshahi Medical College Hospital. The incidence of eclampsia in this series is 2.56% and incidence of antepartum eclampsia is 1.54%.

Table : Overall incidence of eclampsia in pregnancy.

Total number of admission	Number of eclampsia (antepartum, intrapartum & postpartum)	Number of antepartum eclampsia
12176	312 (2.56%)	188 (1.54%)

Grading of hypertension during admission in hospital:

On admission, 34.2% patients had moderate hypertension in vaginal delivery group and 40% patients in caesarean section group ($p>0.05$) and 60% of vaginal delivery group and 57% of caesarean section group has severe hypertension. There was no difference between two groups.

Table: Distribution of the respondents by diastolic blood pressure (n=70)

Diastolic blood pressure	Vaginal delivery (n=35)	Caesarean delivery (n=35)	P value
< 90 mmHg	02(5.7%)	01(2.8%)	0.826ns
90 - 109 mmHg	12(34.2%)	14(40%)	
≥ 110 mmHg	21(60%)	20(57.1%)	

$X \pm SD = 105.3 \pm 10.7$ mmHg

Incidence of severity of albuminuria on admission in patients with eclampsia:

In this study 57 eclamptic patients have severe proteinuria on admission (82.8% in vaginal delivery group and 80% in caesarean section group, $P=0.926$). There was no significant difference of albuminuria between two groups.

Albuminuria	Vaginal delivery (n=35)	Caesarean delivery (n=35)	P value
Mild (+)	01(2.8%)	01(2.8%)	0.926ns
Moderate (++)	05(14.2%)	06(17.1%)	
Severe (+++/++++)	29(82.8%)	28(80%)	

Level of consciousness of eclamptic patients on admission

At the time of admission 45.8% patients of vaginal delivery group and 51.5% of caesarean section group were unconscious ($X=0.726$).

Level of consciousness	Vaginal delivery (n=35)	Caesarean delivery (n=35)	P value
Conscious	19(54.2%)	17(48.5%)	0.726ns
Unconscious	16(45.8%)	18(51.5%)	

Time interval between first convulsion and termination of pregnancy:

Table: Distribution of the respondents by time interval between first convulsion and termination of pregnancy (n=70)

Interval between first convulsion and termination of pregnancy	Vaginal delivery (n=35)	Caesarean delivery (n=35)	P value
< 12 hours	00	09 (25.7%)	<0.01s
≥ 12 hours	35 (100%)	26 (74.3%)	

$X \pm SD = 10.6 \pm 4.5$ hours

Immediate delivery outcome of two groups

Among 70 eclamptic mothers, 5.7% maternal death and 20% foetal death has occurred in intrapartum period in vaginal delivery group and

only 2.8% foetal death in that period in caesarean section group. No intrapartum maternal death has occurred in caesarean section group ($p<0.01$).

Group	Intrapartum maternal death	Intrapartum foetal death
Vaginal delivery (n=35)	02(5.7%)	04(20%)
Caesarean delivery (n=35)	00	01(2.8%)
P value	<0.01s	<0.01s

Foetal outcomes

A) Immediate foetal outcome after birth

Among 70 eclamptic mothers, 65 given birth alive baby, average body weight of the baby were 2.38 KG, among them 74% baby with apgar score <7 in 1st mint and 32.2% at 5 mint in vaginal delivery group and 64.7% baby with apgar score <7 in 1st mint and 26.4% at 5 mint in caesarean delivery group (<0.05).

parameters	Vaginal delivery (n=31)	Caesarean section (n=34)	P value
Birth weight of the baby ($X \pm SD = 2.38 \pm 0.48$ Kg)		03(8.8%) 22(64.7%)	0.925
< 2.00Kg	02(6.4%)	09(26.4%)	
2.00 - 2.49 Kg	22(70.9%)		
≥ 2.50 Kg	07(22.5%)		
Apgar score at 1 st mint, ($X \pm SD = 4.8 \pm 2.8$)		03(8.8%) 19(55.8%)	<0.05
1 - 3	11(35.4%)	12(35.2%)	
4 - 7	12(38.7%)		
8 - 10	08(25.8%)		
Apgar score at 5 mint, ($X \pm SD = 6.2 \pm 1.8$)		01(2.9%)	<0.05
1 - 3	04(12.9%)	08(23.5%)	
4 - 7	06(19.3%)	25(73.5%)	
8 - 10	21(67.7%)		

B) Neonatal morbidity in perinatal period:

There are altogether 53 baby were died with an incidence of 28.19% mortality rate. Most of the foetal death occurs due to birth asphyxia (33.96%) and prematurity (29.30%). Other due to convulsion (17%) and Septicaemia (3.8%).

Table : Distribution of the respondents by cause of foetal death (n=65)

morbidity	Vaginal delivery (n=31)	Caesarean delivery (n=34)	P value
None	13(41.9%)	22(64.7%)	<0.001
Yes	18(58%)	12(35.3%)	
Respiratory distress	06(19.3%)	02(5.8%)	
Feeding problem	05(16.1%)	01(2.9%)	
Jaundice	05(16.1%)	03(8.8%)	
Neonatal seizures	04(12.9%)	02(5.8%)	
Septicaemia	03(9.6%)		
Birth injury	02(6.4%)	00	
Referral to neonatal care unit	12(38.7%)	06(17.6%)	
Multiple complication	07(22.5%)	02(5.8%)	<0.001
Neonatal death (n=12)	04(12.9%)	01(2.9%)	<0.001

C) Neonatal mortality according to disease pattern:

There are altogether 12 baby were died among 135 alive baby in neonatal period, with an incidence of 8.8% neonatal mortality rate. Most of the neonatal death occurs due to prematurity (3.7%). Other due to birth asphyxia 1.4%), convulsion (1.74%) and Septicaemia (1.4%).

Table : Distribution of the respondents by cause of foetal death (n=05)

Causes of perinatal death	Vaginal delivery (n=31)	Caesarean section (n=34)	P value
Convulsion (n=01)	01 (3.2%)	00	<0.05
Septicaemia (n=02)	02 (6.4%)	00	<0.001
Asphyxia (n=02)	01 (3.2%)	01 (2.9%)	>0.05
Total (n=05)	04 (12.9%)	01 (2.9%)	<0.001

Condition of hypertension and proteinuria 24 hours after delivery in two groups.

Variable	Vaginal delivery (n=31)		Caesarean section (n=34)		P value
	On admission (n=35)	After delivery (n=33)	On admission (n=35)	After delivery (n=35)	
Diastolic blood Pressure < 90 mmHg	02 (5.7%)	08 (24.2%)	01 (2.8%)	11 (31.4%)	<0.01
90 - 109 mmHg	12 (34.2%)	15 (45.4%)	14 (40%)	19 (54.2%)	
≥ 110 mmHg	21 (60%)	10 (30.3%)	20 (57.1%)	05 (14.2%)	
Albuminuria	01(2.8%)	05 (15.1%)	01 (2.8%)	07 (20%)	<0.01
Mild (+)	05(14.2%)	11 (33.3%)	06 (17.1%)	14 (40%)	
Moderate (++)	29(82.8%)	17 (51.5%)	28 (80%)	14 (40%)	
Severe (+++/+++)					

Incidence of maternal complication with eclampsia:

Out of 188 patients who were admitted with antepartum eclampsia, 80 patients (42.6%) had developed various types of fatal and non-fatal complications alone or in combination during hospital treatment. Aspiration pneumonia and pulmonary oedema tops the list.

Table 20: Distribution of the respondents by Maternal complication (n=188)**Table :** Distribution of the respondents by Maternal complication (n=)

morbidity	Vaginal delivery (n=33)	Caesarean delivery (n=35)	P value
None	19(57.5%)	24 (68.5%)	<0.001
Yes	14(42.5%)	11 (31.5%)	
• Aspiration pneumonia (n=24)	17	07	

• Pulmonary oedema (n=04)	03	01	
• Placental abruption (n=02)	02	00	
• PPH	03	00	
• ARF (n=03)	02	01	
• CVD (n=01)	01	00	
• HELLP syndrome (n=01)	01	00	
• DI C (n=01)	01	00	
• Postpartum convulsion (n=10)	06	04	<0.001
• Postpartum psychosis(n=04)	03	01	<0.001
• sepsis (n=05)	02	03	
• Multiple complication (n=06)	04	02	
Maternal death (n=04)	03	01	

Maternal outcome on discharge (7th day).

variable	Vaginal delivery (n=30)	Caesarean delivery (n=34)	P valuea
Diastolic blood Pressure			
< 90 mmHg	12	14	
90 - 109 mmHg	12	16	
≥ 110 mmHg	06	04	
Albuminuria			
Mild (+)		16(20%)	
Moderate (++)	11(15.1%)	17(40%)	
Severe (+++/++++)	16(33.3%)	01(40%)	
	03(51.5%)		
Aspiration pneumonia	05	02	
Postpartum convulsion	03	00	
Postpartum psychosis (n=04)	01	00	
Multiple complication (n=06)	04	01	

Discussion

Eclampsia remains a major killer in Bangladesh. It is conventionally considered to be the end stage of preeclampsia. The etiology of preeclampsia is unknown, and the direct cause of eclamptic convulsions is also not known. Eclampsia is a multisystemic disorder, which presents an

interdisciplinary challenge to obstetricians and other physicians, who need to be familiar with pregnancy physiology and the current concepts in the pathogenesis and pathophysiology of severe preeclampsia and eclampsia. A team of obstetricians, other specialists such as neonatologist, cardiologists, nephrologists, neurologists, anesthetist, and nurses with interest and experience are needed in an intensive care unit to protect eclamptic mothers and their child's from death.

Unfortunately there is no eclampsia care unit in Rajshahi Medical College Hospital. These patients are admitted with other pregnant women as usual and keeping them only in a separate room without any specialized supervisory team. Moreover, in the winter and rainy seasons, when incidence is increased (Begum, Begum & Sultana,1992), the number of patients exceeds the allocated beds; the patients along with their babies need to be kept in the floor. These very high-risk patients require intensive monitoring, thorough investigation, and prompt and rational treatment whenever necessary. But the lack of some investigative facilities and the patient overload sometimes hinder standard care. Patients having only minor systemic disturbances, and problems were easy to control with rapid recovery after delivery. Other patients who were desperately ill with renal failure, hepatic failure, cardiac failure, DIC, CVA, HELLP syndrome, and severe pulmonary edema were difficult to manage. Prevention or stabilization of convulsions is the important initial aim but it is clear that convulsions are not the only risk to the mother and foetus.

During the study period 12176 pregnant women were admitted in obstetric unit of Rajshahi Medical College Hospital. Total eclampsia patients were 312 yielding an incidence of 2.56%. Among them 188 women were documented to have antepartum eclampsia with an incidence of 1.54%. The incidence of eclampsia has decrease significantly in different developed countries due to tremendous improvement in antenatal and perinatal care. The reported rate of eclampsia in the Western country is 1 in 2000 to 1 in 3000 deliveries (Matter & Sibai 2000). A series

published in UK (Tuffnell et al 2005) showed the incidence was 5.2/1000 delivery. The incidence of eclampsia is still high in our country mainly in low socioeconomic class. In this study 69.7% patients with eclampsia were from the lower class and 30.3% of subject was from middle class and no from the upper class. This indicates that socioeconomic status plays an important role in developing eclampsia. Proper antenatal checkup and public awareness may have positive impact in reducing the incidence as well as maternal and perinatal mortality in our country.

Fifty nine percent of pregnant women could not avail the opportunity of antenatal care in this study (Table-3). Only 40% have infrequent antenatal visit. Alam (2002), in his study at Dhaka Medical college Hospital shown , 29% pregnant women having eclampsia not received any antenatal care and 53.3% present with irregular antenatal visit. This study shows slight increased frequency of ante natal care but greater percentage of women remains left. Most of the maternal (46.4%) and foetal (596%) complication are developing in un-attendant patients.

In this series, 59% patients were delivered vaginally and 41% require caesarean section operation. This data is in agreement with other series published in recent past in the country and abroad. In the year 2006, Ganguly found, 63.5% incidence of vaginal delivery and 34.3% incidence of Caesarean section in her study. In the same year Tan, Kwek & Yeo showed 51.9% and 48.1% incidence of vaginal delivery and caesarean section respectively. Foetal distress and failed induction is the leading indication of surgical intervention.

Seventeen patients died in this series with a mortality rate 9.04%. Maternal mortality is higher in vaginal delivery group of patients Seven patients died due to pulmonary oedema, 6 after vaginal delivery and 1 after caesarean section ($p < 0.001$). Other 9 patients died after vaginal delivery, 6 due to acute renal failure, one due to DIC, one due to HELLP syndrome and one due to cerebral haemorrhage. One patient died in obstetric shock after caesarean section. One study

in our country had shown the maternal mortality rate 8.8% (Ganguly 2006). The maternal complication rate in my series is also in agreement with the result of other published data. In the 2006 Ganguly shown that aspiration pneumonia (10%), pulmonary oedema (8.8%), placental abruption (7.5%), ARF (7.5%) and CVA (6.3%) were the leading maternal complication. These complication were also the predominant cause of maternal morbidity and mortality in the current series,

In comparison, maternal mortality is 13.5% in vaginal delivery group of patients and 2.5% in caesarean section group. This difference is statistically significant ($P < 0.001$, Table-8). This differs with the study of begum (2003), which has shown 4% maternal mortality in both groups. There is significant difference of maternal morbidity in between vaginal delivery and caesarean section group. Another study in our country also shown higher incidence of maternal morbidity in vaginal delivery than caesarean section (Choudhury 1998).

In this study, the still birth is 21.8% and early neonatal death is 8.1%. Total perinatal death is 28.1% and rest 71.9% are discharged healthy from the hospital. Again stillbirth and neonatal death is higher after vaginal than caesarean delivery, still birth 32.4% in vaginal delivery here as 6.4% in caesarean delivery and early neonatal death 12% in vaginal delivery here as 4.1% in caesarean delivery ($p < 0.001$). Different studies in Bangladesh, perinatal death was found to be 32.10% (sahabuddin et al 1996), 28 % (Shamsuddin. Rouf & Khatoon 1995) and 40.40% (Khanam 2004). In a review of four different studies presented at the first international conference of Obstetrics and Gynecology held in Bangladesh, perinatal mortality in eclampsia was shown from 31-4%. (Begum, Begum & khatoon 1992). Incidence of still birth is high in this study. One study at Rangpur Medical College Hospital shown 24.5% incidence of still birth and 8.4% of neonatal death (Shahabuddin et al 1995).

Perinatal mortality in different studies show 17% (Miller 2007), 15% (Okafor 2009), 47.2% (Tuffnell et al 2005), and 20.23% (Melah , Massa

& Nafaty 2006). In our study, perinatal mortality was 28.1%. In comparison perinatal mortality was higher in vaginal delivery group (40.5%) than caesarean section (11.6%) group ($p < 0.001$).

Conclusion

Pregnancies complicated by eclampsia associated with life-threatening complications for both the mother and infant. Women with little or no antenatal check-up or for whom skilled birth attendants are not available are at greatest risk. Early detection and treatment will keep mild preeclampsia under well control and will reduce the incidence of severe pre-eclampsia and eclampsia. Proper antenatal care and timely intervention by caesarean section can reduce maternal morbidity and mortality significantly.

It is time that doctors took a new look at this major obstetric problem. If all cases of eclampsia occurring in Bangladesh can be reviewed regularly to provide an analysis and overview of what is happening, it might lead to better prevention and management.

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