

Original Article

Comparison of Feto-Maternal Outcomes after Caesarean Section and Vaginal Delivery in Eclamptic Patients

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Abstract:

Introduction: Eclampsia has a high prevalence in our country with a high mortality rate. It is recognized that termination of pregnancy is the only definitive cure of the pathophysiological events in eclampsia. A rational therapy for general management, management of hypertension and convulsion has been established in Bangladesh by the Eclampsia Working Group.

Methodology: This study was carried out in the Eclampsia Ward, Department of Obstetrics and Gynaecology, Dhaka Medical College Hospital, and included 100 consecutively selected patients. In this study, the 50 patients of vaginal delivery group and the 50 patients of caesarean section group were comparable regarding baseline parameters like age, gravidity, socioeconomic status, gestational age, antenatal care and type of eclampsia.

Result: Maternal morbidity was significantly high ($P < 0.01$) among women of vaginal delivery group (54%) compared to caesarean section group (16%). Maternal mortality was 4 percent in the vaginal delivery group and none in the caesarean section group.

Conclusion: Overall fetal outcome was better among the caesarean section group of patients. Fourteen percent of babies were stillborn in the vaginal delivery group compared to four percent in the caesarean section group. Therefore, early caesarean section may significantly improve the feto-maternal outcome in eclamptic patients.

Key words: Feto-maternal outcomes, Caesarean section-vaginal delivery, Eclampsia

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Introduction

Eclampsia is the occurrence of convulsions in association with the features of preeclampsia.¹ Preeclampsia is a multisystem disorder that is usually associated with raised blood pressure and proteinuria.²

Eclamptic seizure classically occurs in the second-half of pregnancy and up to 10 days after delivery. but may occur as late as 6 weeks postpartum.³ Over half a million women die each year from pregnancy-related causes, and 99 percent of these occur in the developing countries, and eclampsia accounts for 50,000 maternal deaths a year worldwide.^{4,5} Still it is one of the leading causes of maternal death in Bangladesh.⁶

The incidence of eclampsia is extraordinarily high in Bangladesh - 7.9 percent (not including preeclampsia) according to the results of a house-to-house survey.⁶ Though rare in the developed countries, it is a common problem in developing countries because illiteracy, lack of health awareness and education, poverty, superstition and beliefs prevent women from seeking medical advice during pregnancy. It is a multi-system disorder, and the pathophysiology is thought to involve cerebral vasospasm leading to ischaemia and cerebral oedema.¹

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Until recently, the treatment of eclampsia varied throughout the world. The basic principles of management are: (a) control of convulsion, (b) control of hypertension, (c) initiation of steps to effect delivery, and (d) general nursing care. The first goal of management of eclampsia is control/prevention of convulsions and stabilization of the patient's basic cardiovascular status. Administration of magnesium sulphate by an established protocol is considered to be the most rapid, efficient and safe pharmacologic approach for accomplishing this goal.⁷

High blood pressure is controlled by injection of hydralazine intravenously followed by oral nifedipine or methyldopa or atenolol. Eclampsia is uniquely a disease of pregnancy, and the only cure is delivery. There is general agreement that the patients should be delivered regardless of gestational age. A national therapy for general management, management of hypertension and convulsion has been established in our setup by The Eclampsia Working Group of Bangladesh, but controversy exists regarding the obstetric management.⁷

As we do not have adequate facilities for intrapartum management, caesarean section is preferred in many cases, particularly when the baby is alive, considering the fact that patients and the fetuses may not tolerate the stress of labour.⁸In Bangladesh, many researchers have worked on eclampsia, but most of the works are related to efficacy, dose and frequency of use of magnesium sulphate, but there are only a few works on obstetric management of eclampsia.

This study was carried out in Dhaka Medical College Hospital (DMCH), which is a tertiary level hospital of Bangladesh. There are four obstetric units having facilities for emergency management round-the-clock. Therefore, the eclampsia ward of DMCH was selected for the study place with a view to identify a relatively better mode of delivery in eclamptic patients.

Therefore, this study was intended to be carried out in a tertiary level hospital in order to identify a relatively better mode of delivery in eclampsia to decide by which route we should deliver the eclamptic patients.

The general aim of the study was to compare the foeto-maternal outcomes after vaginal delivery and caesarean section in eclamptic patients. The specific aims of the study were to determine the foeto-maternal outcome in women with eclampsia after vaginal delivery, to determine the foeto-maternal outcome in women with eclampsia after LSCS and to compare the foeto-maternal outcomes between the two groups.

Materials and Methods

This was an Observational analytic study. The study place was the Eclampsia Unit in the Department of Obstetrics and Gynaecology of Dhaka Medical College Hospital (DMCH), Dhaka. Period of the study was from January 2006 to December 2007 was the duration of the study. The research protocol was approved by the Board Members of the Thesis Committee prior to the commencement of the study. A copy of the letter from the Ethical Committee is attached. The objectives of the study along with its procedures, risks and benefits of this study were explained to the legal guardians (as most of the patients were semiconscious) in easily understandable language and an informed written consent was taken from them. It was assured that all information and records would be kept confidential.

One hundred eclamptic patients admitted to inpatient department, Department of Obstetrics and Gynaecology, DMCH, were included in the study. They were divided into two groups:

- a) Group A: 50 women who underwent vaginal delivery
- b) Group B: 50 women who underwent lower segment caesarean section (LSCS)

The sample size was 384. Consecutive purposive sampling was done.

Inclusion criteria

1. Patients who did not have a specific indication for caesarean section
2. Antepartum and intrapartum eclampsia
3. Singleton, cephalic presentation
4. Term pregnancy
5. Live fetus

Exclusion criteria

- a) Patients who have other indication for caesarean section
- b) Complicated eclampsia, e.g. with pulmonary oedema, renal failure, HELLP syndrome, deep coma
- c) Women having other medical diseases, e.g. heart disease, diabetes mellitus

The variables of the study were age, gravidity, socioeconomic status, type of eclampsia, consciousness level, number of convulsions, recurrence of convulsions and Feto-maternal outcome.

This observational analytic study was conducted in DMCH (eclampsia unit) taking consecutive 50 patients from vaginal delivery group (group A) and consecutive 50 patients from caesarean section (group B). Eclampsia was documented by high blood pressure ($\geq 140/90$ mmHg), significant proteinuria and convulsion associated with pregnancy more than 20 weeks of gestation. Only patients meeting the inclusion criteria were included for the study. After taking informed written consent from the guardians of the patients, a careful history was taken, a

thorough clinical examination was performed and urine was tested (heat coagulation method) for protein. Convulsions were controlled by sulphate ($MgSO_4$) if not contraindicated and blood pressure was controlled by hydralazine, nifedipine or methyldopa. After initial management, decision for termination of pregnancy was taken and the mode of delivery was planned by the senior obstetrician of the respective unit. The mode of delivery was carefully noted and the patients were followed-up till discharge or death. The results are shown in different tables. The maternal outcome variables include: maternal complications, number of maternal deaths and number of recurrent convulsions. The perinatal outcome variables included: number of deaths due to stillbirth and asphyxia. All the relevant data for each patient were recorded in a predesigned data collection sheet by the researcher herself. Collected data were compiled and appropriate statistical analyses (Chi-square test, unpaired Student's 't' test, Z-test, etc.) were done using computer based software, Statistical Package for Social Science (SPSS). P value < 0.05 was taken as minimum level of significance.

Results:

Table-1. Comparison clinical A) and of baseline demographic and characteristics among vaginal delivery (Group caesarean section (Group B) patients.

Parameters	Group A (n=50) No. (%)	Group B (n=50) No. (%)	P value
Age (years)			
≤20	24 (48.0)	22 (44.0)	
21-30	22 (44.0)	20 (40.0)	>0.10 ^{ns}
≥31	4 (8.0)	8 (16.0)	
Mean ± SD	22.66 ± 4.37	23.06 ± 5.36	>0.50 ^{ns}
Range	17-34	17-35	
Gestational age (weeks)			
Mean ± SD	39.76 ± 0.92	39.44 ± 1.20	>0.10 ^{ns}
Range	37 - 42	37-41	
SBP (mmHg)			
Mean ± SD	156.20 ± 17.83	161.20 ± 17.45	>0.10 ^{ns}
Range	120-200	120-190	
DBP (mmHg)			
Mean ± SD	106.50 ± 10.16	109.00 ± 9.85	>0.10 ^{ns}
Range	80-120	90-130	
Socioeconomic status			
Low	40 (80.0)	37 (74.0)	>0.10 ^{ns}
Middle	10 (20.0)	13 (26.0)	
Gravidity			
Primi	30 (60.0)	35 (70.0)	>0.10 ^{ns}
Multi	20 (40.0)	15 (30.0)	
Antenatal care			
Regular	3 (6.0)	4 (8.0)	
Irregular	30 (60.0)	25 (50.0)	>0.50 ^{ns}
None	17 (34.0)	21 (42.0)	
Urinary albumin			
Mild (+)	18 (36.0)	11 (22.0)	
Moderate (++)	9 (18.0)	7 (14.0)	>0.10 ^{ns}
Severe (+++)	23 (46.0)	32 (64.0)	
Type of eclampsia			
Antepartum	45 (90.0)	48 (96.0)	>0.10 ^{ns}
Intrapartum	5 (10.0)	4 (4.0)	
Conscious level on admission			
Conscious	11 (22.0)	4 (8.0)	
Unconscious	16 (32.0)	20 (40.0)	>0.10 ^{ns}
Semiconscious	23 (46.0)	26 (52.0)	

P value reached by Chi-square test/Unpaired Student's 't' test
Ns=Not significant

Comparison of baseline demographic and clinical characteristics between the two study groups did not show any significant difference in any of the parameters (Table-1).

Maximum number of women in group A and B belonged to age group ≤ 30 years (92 vs 84%); mean (\pm SD) age was 22.66 ± 4.37 and 23.06 ± 5.36 years, respectively.

Gestational age was 39.76 ± 0.92 and 39.44 ± 1.20 weeks, systolic blood pressure 156.20 ± 17.83 and 161.20 ± 17.45 mmHg, diastolic blood

pressure 106.50 ± 10.16 and 109.00 ± 9.85 mmHg, in group A and group B women, respectively.

Most of the women were from low socioeconomic status (80 vs 74%), primigravida (60 vs 70%), on irregular ANC (60 vs 50%), severe urinary albumin (46 vs 64 %), ante partum eclampsia (90 vs 96%) and were semiconscious (46 vs 52%). These were the findings in group A and B, respectively.

Table- II. Comparison of different aspects of convulsion parameters among vaginal delivery (Group A) and caesarean section (Group B) patients.

Parameters	Group A (n=50)	Group B (n=50)	P value
Number of convulsion before admission			
Mean \pm SD	4.40 ± 1.51	4.84 ± 2.20	$>0.10^{ns}$
Range	2-7	1-8	
Time interval between 1st convulsion and admission (hours)			
Mean \pm SD	4.78 ± 2.44	5.23 ± 2.55	$>0.10^{ns}$
Range	2-12	1-12	
Time interval between 1st convulsion and treatment (hours)			
Mean \pm SD	5.21 ± 2.47	5.66 ± 2.55	$>0.10^{ns}$
Range	2.33-12.83	1.50 - 12.50	

P value reached by Unpaired Student's 't' test

Ns = Not significant

Comparison of mean (\pm SD) values of different aspects of convulsion parameters between group A and group B did not show any significant difference (Table-II).

Table-III. Recurrence of convulsion after vaginal delivery (Group A) and caesarean section (Group B)

Recurrence	Group A (n=50) No. (%)	Group B (n=50) No. (%)	Total (n=50) No. (%)	P value
Yes	10 (20.0)	3 (6.0)	13 (13.0)	$<0.05^*$
No	40 (80.0)	47 (94.0)	87 (87.0)	
Total	50 (100.0)	50 (100.0)	100 (100.0)	

P value reached by Chi-square test

* = Significant

Recurrence of convulsion was significantly high ($P < 0.05$) in group A (20%) compared to group B (6%).

Table- IVa. Total maternal complications after vaginal delivery (Group A) and caesarean section (Group B)

Parameter	Group A (n=50)	Group B (n=50)	P value
Percentage of complication	54%	16%	$<0.01^{**}$

P value reached by Z-test

** = Significant

Table- IVa shows that maternal complication was significantly high ($P < 0.01$) among women from group A (54%) compared to group B (16%).

Table- IVb. Types of maternal complications after vaginal delivery (Group A) and caesarean section (Group B)

Complications	Group A (n=27) No.(%)	Group B (n=8) No.(%)
Haematurial	6 (22.2)	2 (25.0)
PPH	7 (25.9)	2 (25.0)
Pulmonary oedema	3 (11.1)	3(37.5)
CVA	4 (14.8)	1 (12.5)
Renal failure	4 (14.8)	0
Obstetric shock	2 (7.4)	0
Abruptio placenta	1 (3.7)	0

Table- IVb shows types of maternal complications in group A and group B patients.

Table- V. Maternal mortality among patients undergoing vaginal delivery (Group A) and caesarean section (Group B)

Mortality	Group A (n=50) No. (%)	Group B (n=50) No. (%)	P value
Yes	2(4.0)	0	>0.10 ^{ns}
No	48 (96.0)	50(100.0)	

NOTE: Maternal deaths occurred due to CVA

P value reached by Fisher's exact test
Ns = Not significant

Maternal mortality was 2 (4%) in group A and none in group B. Both the women died due to cerebrovascular accident (CVA) (Table-V).

Table- VI. Fetal outcome among patients undergoing vaginal delivery (Group A) and caesarean section (Group B)

Parameters	Group A No. (%)	Group B No. (%)	P value
Fetal outcome	(n=50)	(n=50)	
Livebirth	43 (86.0)	48(96.0)	>0.05 ^{ns}
Stillbirth	7 (14.0)	2(4.0)	
Complication (among livebirth)	(n=43)	(n=48)	
Asphyxiated	13 (26.0)	25(52.1)	<0.05*
None	30 (60.0)	23 (47.9)	
Referred to ICU (among asphyxiated baby)	(n=13)	(n=25)	
Yes	13 (100.0)	23(92.0)	>0.10 ^{ns}
No	0	2 (8.0)	

P value reached by Chi-square test

ns = Not significant

* Significant

Asphyxia occurred in 26 percent neonates in group A and 52.1 percent in group B, which is statistically significant. Other fetal parameters did not show any significant difference between groups.

Discussion

Eclampsia is a well-recognized major cause of maternal and perinatal morbidity and mortality. Though the incidence has fallen considerably in the developed countries, its incidence, morbidity and mortality are still very high in Bangladesh.⁶

Control of convulsion and management of hypertension are two important parts of the management of eclampsia. There is now conclusive evidence that magnesium sulphate (MgSO₄) is the best available drug for management of convulsion⁷ and is widely used in different centres of Bangladesh. Once the convulsions are under control, there is universal agreement to deliver the patient regardless of gestational age. The mode is determined by gestational age, condition of the cervix and fetal condition.¹The chances of successful induction of labour are low in primigravidae with an

unfavourable cervix at ≤ 34 weeks gestation. Even if induction is successful in this group, emergency caesarean section becomes necessary in up to 45 percent of cases because of fetal intolerance of labour. A high proportion of such cases are, therefore, delivered by caesarean section without an attempt at induction, particularly when delivery needs to be expedited quickly because of concerns about maternal condition.¹

In this study, there was no significant difference in age, gestational age, systolic and diastolic blood pressure, socioeconomic condition, gravidity, antenatal care between group A and group B patients. Average age was 22.66 ± 4.37 (mean \pm SD) years. In vaginal delivery group and 23.06 ± 5.36 years in caesarean section group, and most of the patients (46%) belonged to ≤ 20 years age group. El-Nafaty et al. also found teenage preponderance (66.9%) in the occurrence of eclampsia.⁹ Chuni and Khanna found 36.89 percent patients below the age of 20 years.¹⁰ Rouf et al. (1996) found age preponderance to be between 15-25 years in 76 percent of eclamptic patients.¹¹

In this study, most of the patients were at term having a mean gestational age of 39 weeks. This was 38 ± 2.5 weeks in the El-Nafaty series.⁹ Rouf et al. (1996) found most of the eclamptics (48%) at a gestational age of > 37 weeks.¹¹ In this study 80 percent of patients of vaginal delivery group and 74 percent of patients of caesarean section group were from low socioeconomic status. Study done by Chowdhury has shown that 95 percent of patients belonged to low socioeconomic group.⁸ In this study, an average of 65 percent patients were primigravida as opposed to 73.5 percent of patients in the study of El-Nafaty et al.⁹ This was 62 percent in the study of Rouf et al.¹¹

On an average 38 percent of patients in our study did not receive any antenatal care which was 69.2 percent in the El-Nafaty series.⁹ The two groups of patients were also matched with regard to blood pressure and proteinuria and consciousness level. Most of the patients of both groups presented with antepartum eclampsia in unconscious or semiconscious state.

Regarding the findings related to convulsion, none of the parameters were statistically significant except recurrence of convulsion, which occurred as 20 percent in vaginal delivery group and as 6 percent in the caesarean section group. This rate of recurrence of convulsion is similar to the study of Onuh and Aisien showing a recurrence rate of 4.8 percent.¹² Number of convulsions before admission was 4.40 ± 1.51 (in vaginal delivery group) versus 4.84 ± 2.20 (in caesarean section group). This is similar to the findings of Ikechebelu and Okoli (2002) in which study most of the patients had more than two convulsions before arrival to hospital.¹³

In this series, maternal complications, particularly CVA was more in vaginal delivery group (14.8%), and pulmonary oedema occurred in 11.1 percent in vaginal delivery group of patients and in 37.5 percent in the caesarean section group. In the study of Begum, both pulmonary oedema and CVA were found to be more in the vaginal delivery group occurring in 22 percent and 12 percent of patients, respectively.¹⁴ But according to Coppage and Polzin, CVA occurred in 10.75 percent vaginal delivery and in 17.2 percent caesarean section group.¹⁵ The incidence of pulmonary oedema was also higher in the caesarean section group (15.05%) in the Coppage and Polzin (2002) series, as in our study.¹⁵

Renal failure occurred in 14.8 percent of vaginal delivery patients in our study as against 2 percent of that in the study of Begum.¹⁴ None occurred in the caesarean section group. Four percent of the vaginal delivery group died from CVA and none of the caesarean section group expired in our study. The maternal mortality was same in both groups in the comparative studies by Chowdhury which was 5 percent.⁸ Begum and Begum (2005), which was 4 percent in both the studies. Pulmonary oedema and CVA were two common causes of death.^{6,14}

Fetal outcome revealed that a higher number (14%) of babies were born stillbirth in vaginal delivery group as against 4 percent in the caesarean section group. Complication of birth asphyxia was higher among caesarean section group in our study, 52.1 percent as against 26

percent in the vaginal delivery group. A much higher number of babies were treated in neonatal care unit (NCU) from caesarean section group. Chowdhury has shown almost similar findings. Perinatal mortality has been found to be higher in vaginal delivery group in many studies of this country,⁸ though the results are statistically not significant in this series. This may be due to fact that the babies were already compromised (intrauterine) due to the pathophysiological changes of preeclampsia and eclampsia and could not sustain the stress of labour.

Conclusions

Maternal complications was 54 percent after vaginal delivery and 16 percent after LSCS, the result being statistically significant. The important maternal complications were: pulmonary oedema, CVA and renal failure.

There were two maternal deaths in the vaginal delivery group owing to CVA and none in the caesarean section group, but the difference was not statistically significant.

Regarding neonatal outcome, stillbirth was 14 percent after vaginal delivery and 4 percent after LSCS, though the result was not statistically significant. Birth asphyxia was significantly higher in the caesarean section group (52.1%) than in the vaginal delivery group (26%).

References:

2. Robson, SC 2000, 'Hypertension and renal disease in pregnancy', in Dewhurst's Textbook of Obstetrics and Gynaecology for Postgraduates, Edmonds, DK, ed., 6th ed., Blackwell Science Ltd., London, pp.166-185.
3. The Eclampsia Trial Collaborative Group 1995, 'Which anticonvulsant for women with eclampsia? Evidence from the Collaborative Eclampsia Trial', *Lancet*, 345: pp.1455-1463.
4. Reynolds, C, Mabie, WC & Sibai, BM 2003, 'Hypertensive states of pregnancy', in *Current Obstetrics and Gynaecologic, Diagnosis and Treatment*, Decherney, AH, ed., 9th ed., Lange Medical Books, New York, pp.338-353.
5. Rosenfield, A & Maine, D 1985, 'Maternal mortality - a neglected tragedy. Where is the M in MCH?' *Lancet*, 2: pp.83-85.
6. Mahler, H 1987, 'The Safe Motherhood Initiative: a call to action'. *Lancet*, 1: pp.668-670.
7. Begum, MR, Begum, A, Quadir, E, Akhter, S & Shamsuddin, L 2004, 'Eclampsia still a problem in Bangladesh', *Medscape Gen Med*, p.6.
8. The Eclampsia Working Group 1997, 'Eclampsia in Bangladesh: a review and a guideline', *Bangladesh J ObstetGynaecol*, 12: pp. 1-27.
9. Chowdhury, ML 1998, Role of Caesarean section in improving fetomaternal outcome in eclampsia [dissertation]. Bangladesh College of Physicians and Surgeons, Dhaka.
10. El-Nafaty, AU, Melah, GS, Massa, AA, Audu, BM & Nelda, M 2004, 'The analysis of eclamptic morbidity and mortality in the Specialist Hospital Gombe, Nigeria', *J ObstetGynaecol*, 24: pp. 142-147.
11. Chuni, N & Khanna, S 2004, 'Risk factors in relation to eclampsia in Nepal', *Int J GynecolObstet*, 87: pp. 159-160.
12. Rouf S, Shamsuddin L, Khan JH 1996, 'Magnesium sulphate versus diazepam in the management of eclampsia', *Bangladesh J Obstet Gynaecol*, 11: pp.1-14.
13. Onuh, SO & Aisien, AO 2004, 'Maternal and foetal outcome in eclamptic patients in Benin City, Nigeria', *J ObstetGynaecol*, 24: PP.765-768.
14. Ikechebelu, JI & Okoli, CC 2002, 'Review of eclampsia at the NnamdiAzikiwe University teaching hospital, Nnewi (January 1996-December 2000)', *J ObstetGynaecol*, 22: pp.287-290.
15. Begum, N 2003, Maternal outcome of Caesarean section and vaginal delivery in eclamptic patients a comparative study [dissertation]. Bangladesh College of Physicians and Surgeons, Dhaka.
16. Coppage, KH & Polzin, WJ 2002, 'Severe preeclampsia and delivery outcomes: Is immediate cesarean delivery beneficial?' *Am J ObstetGynecol*, 186: pp.921-923.