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"Feto-maternal Outcomes in Eclamptic Patients including ICU support: A comparative study in Enam Medical College Hospital"

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Abstract: *Eclampsia is alife threatening condition may occur before, during or after labour. Over half-a-million women die each year from pregnancy-related causes, and99 percent of these occur in developing countries. In Bangladesh though maternal mortality rate (MMR) declined significantly around 40% in the past decade, still eclampsia accounts for 20% of maternal deaths. Eclampsia is uniquely a disease of pregnancy, and the only cure is delivery regardless of gestational age. A rational therapy for general management of hypertension and convulsion has been established in Bangladesh by the Eclampsia Working Group. But controversy still exists regarding obstetric management. The aim of this study was to evaluate the feto-maternal outcome in eclamptic patients comparing to cesarean section to vaginal delivery including ICU support.This prospective Cohort study was conducted in the department of Obstretics& Gynecology, Enam Medical college hospital from July 2016 to December 2017. A total of 80 eclampticwomen were included in the study group (group I, 40 patients with vaginal deliveryand group II, 40 with cesarean section). Out of these 80 patients 73% were aged below 25 years, 77.5% were primigravida and 62.5% were from low socioeconomic status. Seventy five (75%) percent patients from group-1 and eighty (80%)group-II had no antenatal care. The mean gestational age was about 38 weeks in two groups. No significant difference was found between the two groups regarding blood pressure, proteinuria, consciousness level and convulsion. Regarding fetal outcome, stillbirth was 30% in group-I and 7.5% in group-II, the result was statistically significant. Birth asphyxia was less in group-II (27.5%) than in group-I (60%) and this was statistically significant. The result of the present study shows a better feto-maternal outcome in the cesarean section group than in vaginal delivery group.*

Key words: *Eclampsia, cesarean section, vaginal delivery, Feto-maternal outcome*

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I. Introduction

Eclampsia is defined as the occurrence of convulsions, not caused by any coincidental neurological disease such as Epilepsy, in a woman whose condition also meets the criteria for preeclampsia. The incidence is about 1 in 1600 pregnancies[1]. In the baseline survey of Emergency Obstetric Care (EOC) in Bangladesh, 5% of total obstetric admissions in health facilities were due to pre-eclampsia and eclampsia.Eclampsia contributes to 20% of maternal mortality on a national basis[2]. Eclampsia is the term used to describe the clinical condition of convulsion associated with pregnancy complicated by preeclampsia and may occur before, during or after labour[1]. Though the incidence has been reduced to 0.2-0.5 percent of all deliveries[3], but in Bangladesh the incidence is 5 percent of total pregnancies[4]. In spite of the different preventive approaches to improve obstetric care in Bangladesh, eclampsia still contributes 20 percent of maternal mortality on a natural basis. Eclampsia is the occurrence of convulsion in association with the features of pre-eclampsia[1]. Pre-eclampsia is a multisystem disorder that is usually associated with hypertension and proteinuria[3].Eclamptic seizure classically occurs in the second half of pregnancy to 10 days after delivery, but mayoccur up to 6 weeks postpartum[1,4].Over half-a-million women die each year from pregnancy related causes and 99% of these occur in the developing countries. In Bangladesh though maternal mortality rate (MMR) declined significantly around 40% in the past decade, still eclampsia accounts for 20% of maternal death[5] .In Bangladesh, the incidence of eclampsia is high (7.9%) according to the results of a house to house survey[6]. Though rare in developed countries, it is a common problem in developing countries because illiteracy, lack of health awareness and education, poverty, superstition and prevent women from seeking medical advice during pregnancy. Still eclampsia is one of the leading causes of maternal death in Bangladesh[5].Eclampsia is a multisystem disorder, and the pathophysiology is thought to

involve cerebral vasospasm leading to ischemia and cerebral edema.[1]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 effective delivery, and (d) general nursing care. The first goal of management of eclampsia is control 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 labetalol, hydralazine intravenously followed by oral nifedipine or methyldopa. Eclampsia is uniquely a disease of pregnancy, and the only cure is delivery 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, cesarean section is preferred in manycases, particularly when the fetus is alive, considering the fact that patients and the fetuses may not tolerate the stress of labor[9].In Bangladesh, many researchers have worked on eclampsia, but most of the works are related to efficacy, dose and frequency of use of magnesium sulphate. There are only a few works on obstetric management of eclampsia. So, we conducted this study in Eclampsia Unit of Enam Medical College Hospital, trying to find out a relatively better mode of delivery for eclampsia patients.

II. Objectives

General Objective:

1. To evaluateFeto-maternal outcomes in caesarean section compared to vaginal delivery in eclamptic patient.

Specific objectives:

1. To determine the feto-maternal Outcomes in Eclampsia after vaginal delivery.
2. To determine the feto-maternal Outcomes in Eclampsia after cesarean section.

3. To compare the conditions the feto-maternal Outcome between the two groups.

III.Materials and Methods

A prospective cohort study was conducted in the department of Obstretics& Gynecology, Enam Medical college hospital from July 2016 to December 2017. A total 80 women with term pregnancy, live fetus were included in the study. Patients were included into two groups. Group I consisted of 40women (patients) with vaginal delivery and Group II 40 women (patients) with lower segment cesarean section. Diagnostic criteria of eclampsia were high blood pressure (>140/90 mm of Hg), significant proteinuria and convulsion associated with pregnancy more than 20 weeks of gestation. The purpose and procedure of the study was explained to the subjects who fulfilled the enrollment criteria. After taking informed written consent from the guardians of the patients, history was taken carefully and a thorough clinical examination was done. Then urine was tested (heat coagulation method) for protein. Convulsions were controlled by magnesium sulphate ($MgSO_4$) if not contraindicated and blood pressure was controlled by labetalol, hydralazine, nifedipine or methyldopa. After initial management, decision for termination of pregnancy was taken methodically. The mode of delivery was carefully noted and the patients were followed-up till discharge or death.

Parameters for fetal and neonatal outcomes were birth weight, APGAR score, live or still births and any complication. Hematuria, pulmonary edema, cerebrovascular accident (CVA), renal failure, obstetric shock, abruptio placenta and postpartum hemorrhage (PPH) were considered as maternal complications.All the relevant data for each patient were recorded in a predesigned data collection sheet. Collected data were compiled and appropriate statistical analyses (Chi-square and unpaired Student's *t* tests) were done using computer based software, SPSS version 16.0. P value <0.05 was taken as minimum level of significance.

IV. Results

Table 1: Comparison of baseline socio-economic and demographic conditions between groups (n=80)

Parameters	Group I (n=40) Vaginal delivery		Group II (n=40) Cesarean section		P value
	Number	Percentage	Number	Percentage	0.745
Age (in years)					
< 20	23	57.5	21	52.5	
21—25	7	15.5	14	35	
26—30	8	20	4	10	
>30	2	5	1	2.5	
Mean ± SD	22 ± 4.23		20.44 ± 3.10		
Range	17—35		17—32		
Gestational age (weeks)					0.412

< 37	19	47.5	15	37.5	
>37	21	52.5	25	62.5	
Mean ± SD	38.01 ± 1.22		38.24 ± 1.16		
Range	37—40		35—40		
Socioeconomic condition					0.793
Lower	25	62.5	27	67.5	
Middle	15	37.5	13	32.5	
Gravida					
Primi	31	77.5	29	72.5	
Multi	9	22.5	11	27.5	

Table 2: Comparison of clinical characteristics betweengroups (n=80)

Parameters	**Group I (n=40) Vaginal delivery**		**Group II(n=40) Cesarean section**		**P value**
Antenatal check-up	**Number**	Percentage	Number	Percentage	0.912
Regular	10	25	8	20.0	
Irregular	26	65	28	70.0	
None	4	10	4	10.0	
Urine albumin					0.24
Trace (+)	11	18.0	6	15.0	
Mild (++)	11	32.0	18	45.0	
Moderate (+++)	8	20.0	8	20	
Severe (++++)	10	30.0	8	20	
Consciousness on admission					0.112
Conscious	08	22.0	4	10.0	
Unconscious	12	32.0	15	37.5	
Semiconscious	20	46.0	21	52.5	

Table 3: Comparison of blood pressure of the study subjects (n=80)

Parameters	**Group I(n=40) Vaginal delivery**	**Group II(n=40) Cesarean section**	**P value**
Systolic blood pressure (mm Hg)			
Mean ± SD	161.9 ± 22.8	162.6 ± 22.79	0.951
Range	120—230	140--220	
Diastolic blood pressure (mm Hg)			
Mean ± SD	100.7 ± 11.25	101.8 ± 14	0.685
Range	79—129	88--124	

Table 4: Comparison of different aspects of convulsion parameters between groups (n=80)

Parameters	**Group I(n=40) Vaginal delivery**	**Group II(n=40) Cesarean section**	**P value**
Number of convulsions before admission			
Mean ± SD	4.9 ± 2.9	4.4 ± 2.78	0.224
Range	1--14	1--12	
Time interval between 1st convulsion and admission (hrs)			
Mean ± SD	4.32 ± 1.87	3.99 ± 2.6	0.543
Range	1--14	1--8	
Time interval between 1st convulsion and treatment (hrs)			
Mean ± SD	4.9 ± 2.24	4.42 ± 2.21	0.734
Range	1--13	1--9	

Table 5: Recurrence of convulsions after delivery (n=40)

Parameters	**Group I(n=40) Vaginal delivery**		**Group II(n=40) Cesarean section**		**P value**
	Number	Percentage Number		Percentage	0.010
Yes	15	37.5	7	17.5	
No	25	62.5	33	82.5	

Table 6: Maternal complications after delivery and their types (n=80)

Parameters	**Group I (n=40) Vaginal delivery**		**Group II(n=40) Cesarean section**		**P value**
Complications	**Number**	**Percentage**	**Number**	**Percentage**	
No Complication	18	45	32	80	0.012
Complication Occurred	22	65	8	20	
Type of complications					
Haematuria	6	15	4	10	
Pulmonary Oedema	4	10	2	5	
CVA	4	10	1	2.5	
Renal Failure	3	7.5	1	2.5	
Obstetric Shock	2	5	0	0	
Abruptio Placenta	3	7.5	0	0	
Death	4	10	3	7.5	

Table 7: Comparison of different neonatal parameters of the study groups (n=80)

Parameters	**Group I (n=40) Vaginal delivery**		**Group II (n=47) Cesarean section**		**P value**
	Number	Percentage	Number	Percentage	
Birth weight (kg)					
Low birth weight	19	47.5	18	45.0	
Normal	21	52.5	22	55.0	
Mean ± SD	2.42 ± 0.36		2.47 ± 0.44		0.646
Range	1.75 --3.6		1.25--3.5		
APGAR score					
At 1st minute					
< 7	24	60.0	13	32.5	
	16	40.0	27	67.5	
Mean ± SD	3.82 ± 2.62		5.42 ± 2.29		0.012
Range	2—8		3—9		
At 5th minute					
< 7	5	12.5	3	7.5	
	35	87.5	37	92.5	
Mean ± SD	6.84 ± 2.39		7.16 ± 2.68		0.512
Range	4—10		5—10		

Table 8: Fetal outcome among patient's in two groups (n=80)

Parameters	**Group I (n=40) Vaginal delivery**		**Group II (n=40) Cesarean section**		**P value**
Number		Percentage	Number	Percentage	
Fetal outcome					
Live birth	28	7.0	37	92.5	0.010
Stillbirth	12	30.0	3	7.5	
Complication(among live births)					
Asphyxiated	24	60.0	11	27.5	0.010
None	16	40.0	29	72.5	
Referred to ICU (among asphyxiated babies)(n=20)					
	(n=10)		(n=10)		
Yes	6	60.0	4	40.0	0.421
No	4	40.0	6	60.0	

V. 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].In Bangladesh, among the causes of death in women of reproductive age, maternal death contributes 14% and eclampsia accounts for 20% of maternal death[5]. Control of convulsion and management of hypertension are two important parts of the management of eclampsia. There is now conclusive evidence that magnesium sulphate ($MgSO_4$) is the best available drug for management of convulsion[7] and is widely used in different centers 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[1] .The chances of successful induction of labor are low in primigravide with an unfavorable cervix at <34 weeks gestation. Even if induction is successful in this group, emergency cesarean section becomes necessary in up to 45% of cases because of fetal intolerance of labor. A high proportion of such cases are, therefore, delivered by cesarean section without attempt to induction, particularly when delivery needs to be expedited quickly because of concerns about maternal condition[1.] In our study, most of the patients at term had *a*mean gestational age of 38 weeks. This corresponds with the other studies.[10,12]In our study has shown that 95% patients belonged to low socioeconomic group and 73.5% of patients in the study of El-Nafaty et al.[11]

In our study, recurrence of convulsion after delivery 37.5% in group-1 and 17.5% in group-II. Convulsions occurred in 55.8% patientsafter the 37th week in the study of Khanam et al [9]. Regarding fetal outcomes, a higher number (30%) of babies were born stillbirth in vaginal delivery group as against seven percent in the cesarean section group. Most of the babies had low birth weight. Mean birth weight was 2.42 kg in vaginal and 2.47 kg in cesarean section groups. APGAR score in 1st minute was 5.42 ± 2.29 in cesarean section group which was better than in vaginal delivery group. Jahan A[21] has shown almost similar findings. Birth asphyxia was higher in vaginal delivery group in our study (60 percent as against 27.5 percent in the cesarean section group). A higher number of babies were treated in neonatal care unit (NCU) from vaginal delivery group. Perinatal mortality has been found to be higher in vaginal delivery group in many studies in this country [8]. Other studies carried out by Ogunniyiet al[17] and Chama et al[18] also revealed high cesarean section rates ranging between 50 percent to 76.5 percent. In this series, maternal complications were more in vaginal delivery group. CVA and pulmonary edema developed in 10% and 10%in Group I. In cesarean section group, it was about 2.5% and 5% respectively. In the study of Begum et al[5] both pulmonary edema and CVA were found to be more in the vaginal delivery group (22% and 12% of patients respectively). This corresponds with some other studies [5]In the study of Khanamet al[9] the major complications like pulmonary edema, HELLP syndrome, DIC, renal failure and obstetric shock were similar to the findings in our study.Renal failure occurred in 7.5% of vaginal delivery patients in our study and it was two percent in the study of Begum etal[4]. Arora et al[19]have advocated early cesarean section in eclamptic patients, at least in the referral centers. This is because they found in their series a maternal mortality of 4.3 percent in the cesarean section group, which is almost half the mortality rate of 7.1 percent in the vaginal delivery group. Moreover, El-Nafaty[20]in his series found a perinatal mortality rate of 25.6 percent in the cesarean section group, which is also about half the perinatal mortality of 47.7 percent in the vaginal delivery group.Jahan A[21] has shown almost similar findings.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 anteparturneclampsia in unconscious or semiconscious state, which is similar to another study.[9]This is similar to the findings of Ikechebelu[15]convulsions occurred in 55.8% patients after the 37th week in the study of Khanam et al [9].Ikechebelu[15] have reported in their series a high cesarean section rate of 85.7 percent among eclamptic patients.

It is observed in this study that the patients in cesarean section a better maternal outcome with fewer incidences of recurrent convulsions and other maternal complications. Regarding fetal outcome, the number of stillbirths and asphyxiated baby was less in group-II than that in group-I; the result being statistically significant. So the result of the study shows a better feto-maternal outcome in cesarean section women.

VI. Limitations of the study

The study population was selected from one selected hospital in Savar, so that the results of the study may not be reflect the exact picture of the country. The present study was conducted at a very short period of time. Small sample size was also a limitation of the present study. Therefore, in future further study may be under taken with large sample size.

VII. Conclusion &Recommendations

This study was undertaken to observe the Feto-maternal Outcomes in Eclampticpatients admitted in a tertiary care private hospital shows the outcome is better in Cesarean section group than in the vaginal delivery

group. So Policy makers and health care provider should give more attention and take initiative to reduceboth maternal and fetal mortality and morbidity.

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