Risk factors and Outcome of Maternal Mortality with Eclampsia at a Tertiary Care Hospital in Bangladesh

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Abstract
Background: *In Bangladesh, the prevalence of eclampsia is extremely high approximately 7.9%. Illiteracy, lack of health awareness and education, poor socio-economic conditions, superstitions and social taboos prevent women from seeking medical advices during pregnancy were the main causes behind it.* ***Method:*** *It was a prospective cross-sectional study conducted in the department of obstetrics & gynecology, Dhaka Medical College & Hospital, Dhaka, Bangladesh. The study period was from July, 2010 to December, 2010 and the sample size was 200.* ***Result:*** *The symptoms of the respondents, were unconscious (GCS <8). The respiratory rate was 17-20/m in 45(22.5%). Diastolic blood pressure was 65(32.5%) and >110 was in 95(47.5%) cases. Among the patients 22(11%) had lungs congested. Only 6(3%) patients' urine volume was normal, 20(10%). Knee jerks were normal in 23(11.5%) cases, exaggerate in 95(47.5%) cases and absent in 45(22.5%) cases. Some risk factor was also found, 141(70.5%) were > 20 years of age or 35 years, 122(61%) were nulliparous, 116(58%) had gestational age > 34 weeks, 159(79.5%) had either more irregular pattern of ANC, 164(82%) antepartum & intrapartum eclampsia, 95(47.5%) were severe hypertension (DBP >110), 146(73%) had unconscious, 22(11%) had lung congestion, 25(12.5%) oliguria, 30(15%) had time interval between developments of convulsion to hospitalization >8 hours* ***Conclusion:*** *In Bangladesh, eclampsia still continues to be an important cause of maternal mortality. Early detection and intensive management are essential for improving the maternal and fetal outcome.*
Keywords: Eclampsia, Maternal mortality, Maternal Outcome, Perinatal outcome

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I. Introduction

The term Eclampsia refers to the occurrence of one or more convulsions in association with the syndrome of pre-eclampsia in the absence of underlying neurologic diseases. It is actually a fatal disorder of pregnant women that has been prevalent since the time of Hippocrates; it remains an important cause of maternal mortality throughout the world, accounting for about 50,000 deaths worldwide.[1] Studies have found that, in developed countries, 1 in 2000 deliveries cases have eclampsia complications.[2] But in developing countries, the prevalence of eclampsia is quite high and varies from 1 in 100 to 1 in 1700.[3-5] The clinical signs on which the various classifications are based are odema, weight gain, hypertension and proteinuria[4]According to the results of a house to house survey, in Bangladesh, the prevalence of eclampsia is extremely high approximately 7.9% (not including pre-eclampsia) and causes16% of maternal death.[6,7] It is the 3rd major cause of maternal death in Bangladesh. However, the patients having eclampsia have some complications which develops gradually due to unawareness and the complications become very serious and cannot be treated easily by the time they visit the doctors.[8] Besides, the eclampsia had been found to range from 11% to 46.4% in hospitals in Bangladesh.[9,10,11,12] The complications of eclampsia may lead to death and according to some study the most common complications which leads to death were intracranial bleeding, cardiac failure, pulmonary edema, HELLP syndrome, DIC, Renal failure, hepatic failure, post-partum shock etc.[13,14,15] In Bangladesh, only 2.3% women had access under medical supervision during their pregnancy (whether it be abortion or delivery).[16] Hence the women suffering from eclampsia most of the time remains unaware about it. Illiteracy, lack of health awareness and education, poor socio-economic conditions, superstitions and social taboos prevent women from seeking medical advices during pregnancy. Besides, the bad communications and absence of

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nearby hospital facilities are also common here.[17] Hence, this study aims to find out the risk factors, symptoms, complications and outcomes of eclampsia in the context of Bangladesh.

II.   Objectives

General objective
To evaluate the important risk factors which are associated for developing complications in eclampsia and the outcome of those patients

Specific objectives
1.   To find out the incidence of developing complications (CVA, Pulmonary edema, Heart failure, HELLP Syndrome, DIC, Hepatic failure, renal failure etc.) among the admitted eclampsia patients.
2.   To find out the risk factors associated with eclampsia developing complications.
3.   To find out the maternal outcome of complicated eclampsia patients.
4.   To find out the perinatal outcome.

III.   Methods

It was a prospective cross-sectional study conducted in the Eclampsia unit under the department of obstetrics & gynecology, Dhaka Medical College & Hospital (DMCH), Dhaka, Bangladesh. The study period was July, 2010 to December, 2010. Proper consent was taken from the respective concerns that were patient & patient's attendance even taken clearance from the ethical committee of the DMCH. The power calculation formula was applied to calculate the sample size, due to the limitations of time the sample size was taken 200. After evaluation of the cases by history taking from the patient & patient's attendance, physical examination & investigations. Necessary data and information were collected by a preformed and pre-tested questionnaire. Data were analyzed using statistical package for social sciences (SPSS) using windows version 14.

Inclusion criteria:
All the admitted patient having eclampsia (ante-partum, intra-partum, post-partum) with associated complication.

Exclusion criteria
Eclampsia patient having pre-existing medical disorder.

IV.   Results
Table 1: Demographic characteristics of the respondents (n=200)

Demographic characteristics		Number of patients(n)	Percentage (%)	Mean±SD
Age group (in year)	<20	88	44	25.19=+7.01
	20-25	31	15.5	
	26-30	28	14	
	31-35	41	20.5	
	36-40	12	6	
Occupation	housewife	153	76.5	
	Service holders	30	15	
	Others	17	8.5	

The above table shows the demographic characteristics of the respondents where maximum 88(44%) of patients belonged to <20 years of age and in assessing the occupation 153(76.5%) were house wife.

Table 2: Clinical History of the Respondent (n=200)

Clinical History		Number of patients (n)	Percentage (%)
Parity	Nulliparous	122	61
	1-3	65	32.5
	>4	13	6.5
Gestational age (weeks)	<28	19	9.5
	28-33	65	32.5
	≥34	116	58
Antenatal checkup	Regular	41	20.5
	Irregular	94	47
	None	65	32.5

Types of Eclampsia	Ante-partum	115	57.5
	Intra-partum	49	24.5
	Post-partum	36	18
Mode of delivery	Spontaneous vaginal delivery	77	38.5
	Assisted vaginal delivery	17	8.5
	Caesarean Section	106	53

The table 2 indicates the clinical history of the respondents, found maximum 122(61%) of patients were nulliparous, Gestational age <28 of 65(32.5%) patients, Irregular antenatal checkup initiated 94(47.7%) patients. Under the type of eclampsia, 115(57.5%) had ante-partum eclampsia. The modes of delivery were found 77(38.5%) had spontaneous vaginal delivery.

Table 3: Symptoms and Risk Factors among the Respondents

Symptoms		Number of patients(n)	Percentage (%)
Level of consciousness	Conscious (GCS >13)	54	27
	Semi-conscious (GCS 9-12)	58	29
	Unconscious (GCS <8)	88	44
Respiratory rate	17-20/m	45	22.5
	>20/m	155	77.5
Diastolic blood pressure	90-100	40	20
	101-110	65	32.5
	>110	95	47.5
Lungs	Clear	9	4.5
	Congested	22	11
Urine volume	Normal	6	3
	Oliguria	20	10
	Anuria	5	2.5
Knee jerks	Normal	23	11.5
	Clonus	27	13.5
	Exaggerated	95	47.5
	Absent	45	22.5
Risk factors	Age (<20 years & >35 years)	141	70.5
	Nulliparous	122	61
	Gestational age >34 weeks	116	58
	Pattern of ANC (irregular to none)	159	79.5
	Antepartum & intrapartum eclampsia	164	82
	Severe hypertension (DBP >110)	95	47.5
	Unconscious	146	73
	Lung congestion	22	11
	Oliguria	25	12.5
	Time interval between developments of convulsion to hospitalization (>8 hours)	30	15

The table 3 displays the symptoms of the respondents, were unconscious (GCS <8). The respiratory rate was 17-20/m in 45(22.5%). Diastolic blood pressure was 65(32.5%) and >110 was in 95(47.5%) cases. Among the patients 22(11%) had lungs congested. Only 6(3%) patients' urine volume was normal, 20(10%). Knee jerks were normal in 23(11.5%) cases, exaggerate in 95(47.5%) cases and absent in 45(22.5%) cases. Some risk factor was also found, 141(70.5%) were > 20 years of age or 35 years, 122(61%) were nulliparous, 116(58%) had gestational age > 34 weeks, 159(79.5%) had either more irregular pattern of ANC, 164(82%) antepartum & intrapartum eclampsia, 95(47.5%) were severe hypertension (DBP >110), 146(73%) had unconscious, 22(11%) had lung congestion, 25(12.5%) oliguric, 30(15%) had time interval between developments of convulsion to hospitalization >8 hours.

Table 4: The Complication of the Patients in Relation with the Time-interval (hours)

Complication	Number of patients (N)	Percentage (%)	Time interval (hours)		
			1-8	9-16	16-24
Pulmonary edema	75	37.5	11	26	37

Renal failure	35	17.5	7	11	16
PPH	36	18	14	12	10
HELLP syndrome	19	9.5	4	7	9
CVA	16	8	2	6	8
Heart failure	9	4.5	1	5	3
ARDS	6	3	3	1	2
DIC	5	2.5	1	1	3
Percentage			21.5	34.5	44

Table 4 shows complication of the patients in relation with the time interval(hours), 75(37.5%) had pulmonary edema, 35(17.5%) had renal failure, 36(18%) had PPH, 19(9.5%) had HELLP syndrome, 16(8%) had CVA, 9(4.5%) had heart failure, 6(3%) had ARDS and 5(2.5%) had DIC.

Table 5: The Maternal and Perinatal Outcome

Outcome		Number of patients(N)	Percentage (%)
Maternal outcome	Alive	149	74.5
	Expired	41	20.5
	ICU support	15	7.5
Perinatal outcome	Term	29	14.5
	Preterrm	30	15
	Post terrm	11	5.5
	Living	94	47
	Still birth- fresh	12	6
	IUD- macerated	18	9
	Neonatal death	6	3
	Neonatal convulsion	15	7.5
	Neonatal jaundice	20	10
	Neonatal asphyxia	8	4
	Septicaemia	12	6

Table 5 presents the maternal and perinatal outcome of the patients. 149(74.5%) were survived and 41(20.5%) were expired and 15(7.5%) required ICU support. Under the perinatal outcome, 2(14.5%) were term baby, 30(15%) were preterm baby, 11(5.5%) were post-term, 94(47%) were living, 12(6%) were still birth, 18(9%) were IUD and 6(3%) were neonatal death, 15(7.5%) were neonatal convulsion,20(10%) were neonatal jaundice, 8(4%) were neonatal asphyxia and 12(6%) were septicaemia.

V.   Discussion

A similar study conducted by Yasmin N where 43% patients were in the age group of<20.[18] In the current study maximum 44% of patients <20 years of age and followed by 15.5% patient belonged to 20-25 years, 14% patient of 26-30 years, 20.5% patient of 31-35 years, and 6% patients of 36-40 years. In assessing the occupation, it was found that 76.5% were house wife, 15% were service holder and 8.5% were from other occupation. [Table 1] In the clinical history of the respondents found maximum 122(61%) of patients were nulliparous, Gestational age <28 of 65(32.5%) patients, Irregular antenatal checkup initiated 94(47.7%) patients. Under the type of eclampsia, 115(57.5%) had ante-partum eclampsia. The modes of delivery were found 77(38.5%) had spontaneous vaginal delivery. [Table 2] another study showed mortality is increased two-fold if the fetus is small for gestational age.[21,22] In this study 20.5% had regular antenatal checkup where 47.7% patient had irregular and 32.5% had no antenatal checkup.[Table 2] The study of Miguil M found that most 62% of the patients had no or irregular ANC.[23] Another study showed lack of antenatal care or substandard care is related to death in hypertensive diseases.[24-26] Under the type of eclampsia, 57.5% had ante-partum eclampsia, 24.5% had intra-partum and 18% had post-partum eclampsia. The study of lee W presented more or less equal proportion of ante partum eclampsia cases 61% but higher proportion of post-partum cases 31%.[27]

The symptoms of the respondents, were unconscious (GCS <8). The respiratory rate was 17-20/m in 45(22.5%). Diastolic blood pressure was 65(32.5%) and >110 was in 95(47.5%) cases. Among the patients 22(11%) had lungs congested. Only 6(3%) patients' urine volume was normal, 20(10%). Knee jerks were normal in 23(11.5%) cases, exaggerate in 95(47.5%) cases and absent in 45(22.5%) cases. Some risk factor was

also found, 141(70.5%) were 20 to 35 years, 122(61%) were nulliparous, 116(58%) had gestational age > 34 weeks, 159(79.5%) had either more irregular pattern of ANC, 164(82%) antepartum & intrapartum eclampsia, 95(47.5%) were severe hypertension (DBP >110), 146(73%) had unconscious, 22(11%) had lung congestion, 25(12.5%) oliguria, 30(15%) had time interval between developments of convulsion to hospitalization >8 hours. [Table 3] which were related with the study of Naznin S.[20] Complication of the patients in relation with the time interval(hours), 75(37.5%) had pulmonary edema, 35(17.5%) had renal failure, 36(18%) had PPH, 19(9.5%) had HELLP syndrome, 16(8%) had CVA, 9(4.5%) had heart failure, 6(3%) had ARDS and 5(2.5%) had DIC. [Table 4] the maternal and perinatal outcome of the patients. 149(74.5%) were survived and 41(20.5%) were expired and 15(7.5%) required ICU support. Under the perinatal outcome, 2(14.5%) were term baby, 30(15%) were preterm baby, 11(5.5%) were post-term, 94(47%) were living, 12(6%) were still birth, 18(9%) were IUD and 6(3%) were neonatal death, 15(7.5%) were neonatal convulsion,20(10%) were neonatal jaundice, 8(4%) were neonatal asphyxia and 12(6%) were septicaemia. [Table 5]

Limitation of the study

The power calculation formula was applied to calculate the sample size. According to the calculation the sample size was 250 but due to the limitations of time the sample size was taken 200. The study was conducted only in a hospital that not show the holistic result of the country. Lack of budget shown as limitations of this this study.

VI. Conclusion

The incidence of developing complications of eclampsia for instance pulmonary edema, HELLP syndrome, renal failure, heart failure, cerebrovascular accident and postpartum hemorrhage among 20 to 35 years, nulliparous, gestational age more than 34 weeks, irregular pattern of ANC, severe hypertension, delayed hospitalization and disregard in initiation of treatment. The disease is common in patients coming from low socio-economic class, who do not have basic health education and do not seek medical advice in time.

VII. Recommendation

Early detection and intensive management are essential for improving the maternal and fetal outcome. Medical staff should be aware of its pathophysiology and acute management in order to reduce the maternal morbidity and mortality which are still associated with this condition.

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References

[1]. Deley I. Maternal mortality associated with the hypertensive disorder of pregnancy in Africa, Asia, Latin America and Caribbean. Br JObstet Gycecol 1992; 99:547-53.
[2]. World health organization. The world health report 1998:Iife in the 21st century;a vision for all.Geneva:W1-lO 1998,p.97
[3]. Ghosh MK.Maternal mortality: a global prospective. J Report Med 2001;46:427-33
[4]. World health organization.The hypertensive disorder of pregnancy Report of a WHO study group. WHO technical report serious 758.Geneva: WHO 1987;.63-9.
[5]. Mahmoudi N, .Graves, SW Solomon CG,etal.Eclampsia: 13 year experiences at a united states tertiary care center.J Women's health Gend-Based Med 1999;8:495-500.
[6]. Ekholam E,Salmi MMErkkola R. Eclampsia in Findland in 1990-94.Acta Obstet GynecoiScand 1999,78:877-82.
[7]. Kenneth H. Adult female mortality level and cause in Bangladesh maternal health service and maternal survey. Dhaka Nipport, 2001
[8]. Begum MR. Begum A, Quadir E, Shamsuddin L. Eclampsia; still a problem in Bangladesh. Medscape General Medicine. 2006;8(10):68.
[9]. Jahan S. A Study on obstetrical caseaAdmiued in Khulna Sadar Hospital in the year 1981 Paper presented at the 7th annual contributors conference of Bangladesh Fertility Research Programme (BFRP) held on 8-9 December 1982 at Dhaka.
[10]. Chowdhury TA. Profile of 17,751 Institutional Deliveries for the period 1975-80 in Bangladesh, Paper presented at the Annual Contributors Conference of the Bangladesh Fertility Reasearch Programme held on 4th December 1981 at Dhaka.
[11]. Chowdhury TA. Report on obstetrics Deliveries at Institute of Postgraduate Medicine, Paper presented at International Fertility Research programme at North Carolina, USA. 1982.
[12]. MDU (1992) Report of eclampsia study at Manikgonj Hospital Management Development unit (MDU), MOHFW, Dhaka 1992;3-27.
[13]. Dutta DC. Safe motherhood epidemiology of obstetrics. in: Konar H, editor. Textbook of obstetrics including perinatology and contraception, 6th revised ed. Calcutta: Central Book Agency (P) limited, 2008: 599.
[14]. Begum MR, Begum A, Quadir E, Akter S, Shamsuddin L, et al. 'Eclampsia: Still a problem in Bangladesh' MedGenMed. ob/Gyn and Women's Health, 2004; 6(4):52.
[15]. Kenneth H. Adult female mortality level and causes, In: Bangladesh maternal health services and maternal survey. Dhaka:

NIPPORT, 2001.
[16]. Kenneth H, Caria AZ, Tessa W. Estimates of maternal mortality for 1995, Bull WHO 2001; 79:182-93.
[17]. Benoit S, Marie HBC, Noelle V, Sophie A, Alison M. Classification differences and maternal mortality: a European study. Int. J Epidemiol 1999; 28: 64-9.
[18]. Chesley LC. Hypertensive disorders in pregnancy. New York; Appletion century-crofts, 1978.
[19]. Suman G. Somegowda. Maternal and perinatal out come in a district hospital. J Obstet Gynecol India 2007; 57(4): 324-326.
[20]. Naznin S. 'clinical evaluation of causes of eclampsia in a tertiary care hospital.' A Study in COMCH, Comilla (Dissertation). Bangladesh colleges of Physicians and Surgeon. 2008
[21]. Lucky C, Chappell MB, Paul T, Brily A, Kelly JF, Beverly J, et al. A longitudinal study of biochemical variables in women at risk of preeclampsia. Am J Obstet Gynecol 2002; 187: 127-36.
[22]. Redman CWG, Roberts, JM. Management of preeclampsia. Lancet 1993; 341: 1451-54
[23]. Miguil M, Chekairi A eclampsia study of 342 cases. Hypertestion in pregnancy; May 2008;27:103-111.
[24]. Davey DA, Hypertensive disorders of pregnancy. In whitefied CR (Editors), Dawhurst's text book of Obstetrics and gynaecology for post graduates, 4th editions, Oxford. Blackwell scientific publications. 1986: 200-41.
[25]. Dekker GA, Sibai, BM. Early detection of preeclampsia. Am J Obstet Gynecol 1991; 165: 160-72.
[26]. Philip JS, Mark PL, Tina KJ, Chapple. Maternal blood pressure in pregnancy, birth weight and perinatal mortality is first birth. BMJ 2004; 329: 1312-4.
[27]. Reynold C, Mabie WC, Sibai BM, Decherny AH, Nathan, L. Hypertensive status of pregnancy. 9th ed. New York: McGraw-Hill; 2003: p.338-53.