

Eclampsia-scenario in a hospital- a ten years study

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Abstract

This cross sectional record based institutional study was conducted in the Department of Obstetrics & Gynaecology, Burdwan Medical College, Burdwan over ten years (1999-2008) aiming analysis of eclamptic mothers for evaluation of maternal and perinatal outcome with different anticonvulsant medications. Total 5991 pregnant mothers with eclampsia admitted in the inpatient department of the tertiary care teaching hospital were recruited for the study, irrespective of their previous antenatal check up history. Subjects with known seizure disorders were excluded from the study. The subjects were managed according to standard regimens (Menon, Ph-sodium, diazepam & magnesium sulphate) and results were documented in standardised format. Case fatality rate, mean induction delivery time & birth-weight, perinatal mortality rates were recorded. Study reveals that the incidence of eclampsia <20 years was 6.97% and majority (5.41%) came from rural areas. Eclampsia was noted primarily in primigravida (7.43%) and unbooked (6.41%) mothers. Ante partum eclampsia predominated (64%) and incidence of caesarean section was 22.25%. The overall case fatality rate was 6.05% and eclampsia contributed 27.85% of all maternal deaths during the last two years of the study period. The overall incidence of low birth weight baby was 26.96% and perinatal mortality was 30.33% (1411/4651). The incidence of perinatal mortality and low birth weight babies are lower in the last 4 years when compared to earlier studies. Proper socio-demographic assessment of pregnancy with eclampsia, planned delivery, shorter induction delivery interval, good control of convulsion by magnesium sulphate, intensive intranatal monitoring causes less maternal and perinatal morbidity and mortality.

Introduction

Eclampsia is a multi-system disorder with complex pathogenesis. Majority of the death occurs in the developing countries and most of them are preventable. Eclampsia causes 12% of all global maternal deaths¹. The eclamptic convulsion is a major source of perinatal morbidity or mortality unless expertly managed². In India maternal mortality rate in eclampsia is very high. The figure ranges from 8-14%³⁻⁵ and perinatal mortality varies from 24-34%^{6,7}. The role of injection magnesium sulphate as an anticonvulsant is better over diazepam and phenytoin sodium⁸.

The study was carried out to analyze the incidence of eclampsia, types of eclampsia, sociodemographic characteristics of the subjects, mode of delivery, maternal and perinatal outcomes over the study period. The study also evaluated the utility of different management protocols followed in the hospital to treat pregnancy with eclampsia.

Materials and Methods

A retrospective analysis of case records of eclamptic mothers was reviewed from January, 1999 to December, 2008 in the Department of Obstetrics and Gynaecology, Burdwan Medical

College, Burdwan. Burdwan is a district town located approximately 100 Km from Kolkata, capital of West Bengal, India. This is a tertiary care teaching hospital with 1105 beds with more than 17500 deliveries conducted every year. There was 1,40,701 deliveries during the study period and 5991 eclamptic mothers were studied. All mothers with eclampsia, irrespective of booking status were admitted in the hospital without refuse and they were kept in a separate room. The pregnant women with known seizure disorders were excluded from our study. All of these cases were analyzed with reference to age, gravidity, and socio-economic status, type of eclampsia, mode of delivery, maternal mortality and fate of fetus. In the study period of the year 1999-2000, out of 1280 eclamptic mothers the lytic cocktail (menon's regime) was used in 640 (50%) cases and diazepam regime was used in 640 (50%) cases respectively. During the year of 2001-2002, phenytoin sodium was solely used as an anticonvulsant for the treatment of 1315 eclamptic mothers. In the year 2003-2004, out of 1044 cases, injection magnesium sulphate was used in 940 cases (90%) and Inj. phenytoin sodium was used in 104 (10%) cases. Two thousand and three hundred fifty two mothers with eclampsia were treated exclusively with inj. magnesium sulphate

(MgSO₄) regime in the year 2005-2008. After stabilization of patients with different anticonvulsant drugs at different phases of the study period, obstetric management was undertaken and detailed analysis was recorded in a predesigned proforma.

The statistical analysis was done in Microsoft excel by ANOVA- two ways without replication and chi square test. p-value <0.05 is considered significant.

Results

Table I depicts the maternal characteristics. Eclampsia was more common below 20 years (6.97%) of age group, primimother (7.43%), lower socio-economic status (5.67%) and in unbooked (6.41%) cases.

Recurrence of convulsion was lowest (5.7%) in inj. magnesium sulphate groups when compared with phenytoin sodium (10.9%), menon (32.8%) and diazepam (40.3%) regimes used for treatment of convulsion in eclamptic mothers (Table II). The mean induction delivery interval was highest (22.23 hrs) in diazepam group and lowest (12.75 hrs) in phenytoin sodium groups but is not statistically significant (p value =0.305) (Table III).

Table IV shows the different mode of delivery. The lower segment caesarean section (LSCS) rate was higher in MgSO₄ (27.55%) and phenytoin sodium group (22.63%) when compared to menon and diazepam groups.

Table I: Socio-demographic profile of eclamptic mothers

Age (Yrs)	No. of deliveries	Ecalmpsia(no.)	Eclampsia (%)
<20	49625	3463	6.97%
20-25	37031	880	2.37%
25-30	32421	847	2.61%
30-35	20678	771	3.72%
>35	946	30	3.17%
Total			
Gravidity	No. of deliveries	Eclamptics	Eclampsia and gravidity (%)
1	69435	5165	7.43%
2	48344	527	1.09%
3	19704	180	0.91%
4 or more	3218	119	3.69%
S-E status	No. of deliveries	Eclamptics	Eclampsia & S-E status (%)
High	5534	230	0.90%
Middle	35372	1232	3.48%
Low	79795	4529	5.67%
Residence	No. of deliveries	Eclamptics	Eclampsia & residence (%)
Urban	48371	995	2.05%
Rural	92330	4996	5.41%
Religion	No. of deliveries	Eclamptics	Eclampsia & religion (%)
Hindu	74729	3783	5.06%
Muslim	65972	2208	3.34%
Antenatal Care	No. of deliveries	Eclamptics	Eclampsia & ANC (%)
Booked	68310	1349	1.97%
Unbooked	72391	4642	6.41%

S-E: Socioeconomic; ANC: Antenatal Care

The overall perinatal mortality was 30.33% in the study period. In the year 1999-2000 (regimes used menon and diazepam) the perinatal mortality was 54.1%, 32.5% in the year 2001 -2002 (regimes used only ph. Sodium) and lowest (22.4%) in the year 2005-2008, when only injection MgSO₄ was used (Table V). The incidence of low birth weight babies was 15.68% in the last 3 years but the overall incidence of lbw in the study period was 26.96% (1254/4651) (Table VI). The contribution of maternal mortality due to eclampsia in the year 2007 and 2008 were 30.98% and 24.63% respectively. There were 363 maternal deaths out of 5991 eclamptic mothers giving on overall case fatality rate of 6.05 % (Table VII). Cases of epistaxis were investigated among 1135 mother with eclampsia in 2007-2008 and all the 23mothers were found to have traumatic epistaxis.

Table II: Number of patients having recurrence of convulsion

Parameters	Menon (n=640)	Diazepam (n=640)	Ph. Sodium (n=1419)	MgSO ₄ (n=3292)	Statistics*
Recurrence of fits	210(32.8)	258(40.3)	156(10.9)	187(5.7)	F=13.72034 F crit=5.1432253 p-value=0.00576
APE	179	135	99	109	
IPE	08	16	12	25	
PPE	23	107	45	53	

*ANOVA-Two factors without replication, the rows (different types of eclampsia) have a significant effect as F-value is larger than the critical value n (%); APE, Ante partum eclampsia, IPE, Intrapartum Eclampsia, PPE, Postpartum eclampsia.

Table III: Mean Induction Delivery (I-D) Interval

Regimes	Time (hour) Mean (SD)	Statistics	p-value
Menon	20.02(3.5)	F-2863.25	p<0.0001
Diazepam	22.23(3.2)		
Ph. Sodium	12.75(2.4)		
MgSO ₄	14.12(1.7)		

SD, Standard deviation; one way ANOVA

Table IV: Mode of Delivery

No. of cases (n=4598)	Menon (n=515)	Diazepam (n=515)	Ph. Sodium (n=1052)	MgSO ₄ (n=2516)
VD (2682)	360(69.90)	387(75.15)	671(63.78)	1264(50.23)
Forceps (882)	111(21.56)	73(14.17)	139(13.21)	559(22.22)
Craniotomy(11)	04(0.77)	03(0.59)	04(0.38)	-
LSCS (1023)	40(7.77)	52(10.09)	238(22.63)	693(27.55)

VD: vaginal delivery; LSCS: Lower segment caesarean section, Death of undelivered mother-37; All PPE cases(1356) excluded; n(%), ANOVA-two factors without replication: The rows (different methods of delivery have a significant effect as F-value (9.55140) is larger than the critical value (3.86254) and p value=0.003701.

Table V: Fate of Fetus

Year	Delivery of ECL mother n=5991	PPE n=135	MD n=37	MP n=53	Babies n=4651	SB n=1054 (22.66%)	NND n=357 (7.67%)
1999-2000	1280	540	11	8 ^a (16)	745	273(36.7)	130(17.4)
2001-2002	1315	390	09	9 ^a (18)	934	209(22.4)	94(10.1)
2003-2004	1044	210	05	3 ^a (06)	835	180(21.6)	45(5.4)
2005-2008	2352	216	12	5 ^a (10) 1 ^b (03)	2137	392(18.3)	88(4.1)

ECL: eclamptic; Total no. of babies (4651)=Total no. of ecl mothers (5991)-1356 [post partum eclampsia (PPE)]-37 [undelivered maternal death (MD)]+53 [no. of multiple pregnancies (MP), n^aTwin pregnancies; n^bTriplet (no. of babies)]; SB-still birth, n(%); NND-neonatal death, n(%) [Perinatal mortality (PNM)=SB+NND=1054(22.66%) +357(7.67%) =1411(30.33%)]

ANOVA: Two factors without replication- The column (fate of the fetus) have a significant effect because the F-value (15.9367) is larger than F crit (10.12796); p-value 0.028154.

Table VI: Low Birth Weight babies in eclampsia

Year	No. of babies (n=4651)	BW (g)	LBW [n=1254(26.96%)]	
	Column (%)	Mean (range)	Yes n(row %)	No n(row %)
Total	4651	3060(2221)	453(60.8)	292(39.19)
1999-2000	745(16.01)	3060(2111)	347(37.1)	587(62.9)
2001-2002	934(20.09)	3020(1632)	119(14.25)	716(85.75)
2003-2004	835(17.95)	2961(1510)	335(15.68)	1802(84.32)
2005-2008	2137(45.95)	3040(1701)		

BW: Birth weight; LBW: Low birth weight

Table VII: Case fatality rate and contribution of eclamptic maternal death

Year	No. of eclampsia (m)	Maternal death (n)	Death due to eclampsia (p)	Case fatality rate(F) F=p/m %	Contribution to death (C) C=p/n %
1999	678	81	43	6.34	53.08
2000	602	105	68	11.29	64.76
2001	789	87	41	5.20	47.13
2002	526	117	62	11.79	52.99
2003	531	66	26	4.89	39.39
2004	513	63	29	5.65	46.03
2005	574	77	31	5.40	40.25
2006	643	68	24	3.73	35.29
2007	624	71	22	3.52	30.98
2008	511	69	17	3.32	24.63
Total	5991	804	363	6.05	45.14

INCIDENCE OF ECLAMPSIA

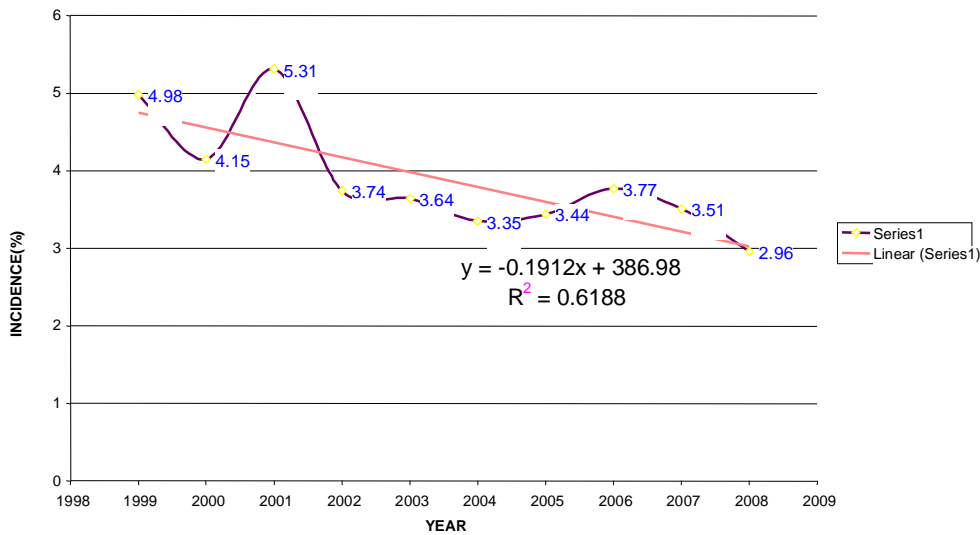


Fig.1- Incidence of eclampsia

R² value shows that about 61% of the variation in incidence is explained by time factor (years) through the linear model

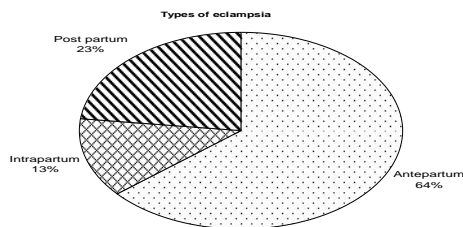


Fig.2- Types of eclampsia

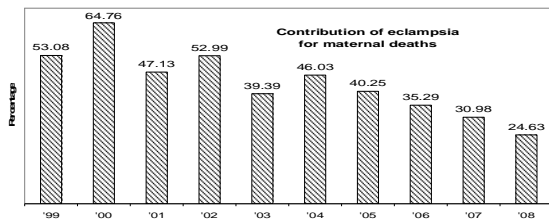


Fig. 3: Contribution of eclampsia for maternal deaths

Discussion

The overall incidence of eclamptic mother in our study was 4.23% (5991/140701). This is mainly because our hospital serves predominantly on rural population. The incidence of eclampsia has been reported between 0.179% to 2.9%^{3,7,10} in different studies. In our study of 10 years, the incidence of eclampsia is shown in figure 1 and the lowest incidence (2.96%) was noted in the year 2008. In the present series 6.97% of eclamptic mothers were below the second decade, 2.37% were below 25 years. The younger age group is an important risk factor of eclampsia and this was supported by different reports^{10,11}. Primigravida appeared to be the worst victim (7.43%) for eclampsia (Table I). Primigravida comprises the bulk of the series in different studies^{3,5,10}. Eclampsia developed in

1.97% of booked cases in our study. The incidence of eclamptic convulsions was higher (6.41%) in unbooked cases as they were unidentified for prompt treatment of pregnancy induced hypertension (PIH), which increases the incidence of eclampsia. The majority of cases (64%) were antepartum eclampsia in our series. Antepartum eclampsia is also very common in different studies and the incidence were 29.13%³, 51.2%⁵ and 60.2%⁶, but a few studies reported the predominance of intrapartum eclampsia over the antepartum eclampsia¹⁰, and postpartum eclampsia has an upward trend⁷. Previously there was no standard protocol for obstetric management in eclampsia and vaginal delivery was more preferable with more relaxation of induction-delivery (I-D) interval for fear of caesarean section complications, but now caesarean delivery is the method of choice if vaginal delivery is not anticipated within 12 hours from the onset of convulsion and even after induction. Early caesarean section was also performed in repeated recurrence of convulsion. Anticonvulsant like inj MgSO₄ used for stabilization of eclamptic mother had less recurrence of convulsion (5.71%) [Table II]. Normal vaginal delivery occurred in 58.32% (2682/4598) of cases. Second stage of labour was made cut short by forceps in 882 cases. Caesarean section was performed in 22.25% (1023/4598) of cases in our series. Agarwal et al⁹ reported similar incidence (22%) of caesarean section. Many centres liberalised caesarean section for better maternal and fetal outcome. The reported incidence varies between 49-70%^{7,8,12}.

The perinatal outcome in our study was low birth weight (26.96%, 1254/4651), still birth (22.7%; 1054/4651) and neonatal death (7.67%; 357/4651). Our observation was similar with the findings of Agarwal et al⁹. Reports from different hospitals showed a high still birth rate^{5,9,10,12}. The perinatal mortality was 31% in ph.sodium, 41% in MgSO₄ and 58.1% in menon's regime¹³. Prematurity, low birth weight, placental insufficiency, late arrival were the contributing factors of perinatal loss in our study. Magnesium sulphate regime can reduce the perinatal mortality to a reasonable standard of 22.4% (Table V) in our report and it was comparable with the findings of Desai et al⁶.

The maternal mortality was 10.72% which comprised 14.08% of all maternal deaths⁵. Maternal mortality was 6.05% in our series. It is a low figure than other Indian studies^{2-4,10}. Haphazard combinations of sedative and anticonvulsants and improper management of labour in different centres are important factors for high maternal mortality in eclampsia. In the present series death of eclamptic mothers formed the main bulk (45.14%) of

maternal death (Table VII). Regarding the choice of anticonvulsant, it was noted that the introduction of inj. magnesium sulphate dropped the maternal death in eclampsia in the last four years [mean 23.5 (range 17-31)] (Table VII). The contribution of eclamptic maternal death is also reduced in the last two years (27.85%) [Fig-3] but still is higher on comparison to world standard. This is mainly due to late referral, poor antenatal check up, and transfer of moribund patient just before death to the tertiary hospital

Conclusion: Eclampsia still remains the major problem in developing countries. Incidence of perinatal mortality and maternal mortality is disappointing in eclampsia. Poor socio-economic status, lack of essential obstetric care is the fundamental determinants of maternal deaths not only for eclampsia but as a whole. Unless the social, educational status are uplifted and antenatal coverage is brought to the grass root level no miracle can be expected. A moderate reduction of death of both mother and fetus in our institution is possible due to wider use of magnesium sulphate; timed delivery and proper implementation of emergency obstetrics care (EmOC) facilities to mothers with eclampsia.

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