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Research Article

Maternal and perinatal outcome of eclampsia in a tertiary care centre

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ABSTRACT

Background: Eclampsia is associated with devastating maternal and fetal complications. The main objective was to study the perinatal and maternal outcome and the causative factors for the mortality and morbidity in eclampsia patients admitted to this hospital and to explore the factors contributing to the alarming situation.

Methods: 218 eclampsia cases admitted to the labour room in Department of Obstetrics & Gynaecology, SCB Medical College Cuttack, Odisha, India from Jan 2013 to Sept 2014 enrolled for the study.

Results: In this study 218 eclampsia cases were studied. The incidence of eclampsia in S.C.B.MCH during study period was 1.39%. Most of the patients were primigravida accounting 83.48% out of which 74.31% were antepartum, 14.22% were intrapartum and 11.47% were postpartum. 44.04% of cases had no ANC and 40.36 irregular ANC. Occurrence of onset of eclampsia at <34 weeks GA 27.53%, 35-37 weeks 43.12 % and >38 weeks 29.35%. Most of patients were from rural area (97.50%) and having low socioeconomic status (83.94%) and illiterate. Out of 218 cases 46.33% patients had vaginal delivery, 3.21% patients had vaginal delivery with instrumentation.

Conclusions: There is a need of proper antenatal care to prevent eclampsia and the need for intensive monitoring of women with eclampsia throughout hospitalization to improve both the maternal and perinatal outcome.

Keywords: Eclampsia, Perinatal outcome, Maternal transfer, Magnesium sulphate

INTRODUCTION

Eclampsia is a serious obstetric complication peculiar to pregnancy and may appear before, during or after labour. It is characterized by hypertension, proteinuria, edema and tonic clonic seizure with or without loss of consciousness. It still remains the second most common cause of maternal and perinatal morbidity and mortality in under privileged population. Globally eclampsia is the fourth most common cause of maternal death, accounting for 12% of maternal mortalities.¹ There is a wide range of variation in maternal and perinatal mortalities in different countries. It is one of the major causes of maternal deaths in India. In the annual report 2001-2002, Ministry of Health and Family welfare, Delhi, declares that hypertensive disorders of pregnancy accounts for 8% of all maternal death. Perinatal mortality varies from 30%-60%.¹ Adequate antenatal care with improved medical and obstetric facility and effective

management has decreased the incidence of eclampsia to a great extent in developed countries.

Eclampsia is defined as the development of convulsions and/or unexplained coma during pregnancy or postpartum in patients with signs and symptoms of preeclampsia. Eclampsia is associated with serious maternal and perinatal complications. The incidence of eclampsia in developed countries range from 1 in 2000 to 1 in 3448 pregnancies which is much lower than in developing countries like India. The incidence of eclampsia in India has been quoted as 1.56%.² Majority of cases of eclampsia are young primigravidas and those with no prior antenatal care. Though not all cases of eclampsia can be prevented, majority of cases can be prevented by early detection and effective treatment of preeclampsia, for which good ANC services are needed.³

Eclamptic convulsions leading to maternal and perinatal morbidity and mortality could be prevented by appropriate antenatal care. The reduction in both maternal and perinatal mortality remains the yard stick of success in the management of eclampsia. Better health care facilities, improvement of socio-economic and educational status of the people and recognition of the seriousness of problem and availing the health care facility by the people themselves, adequate antenatal supervision followed by early treatment and timely interventions will greatly reduce the morbidity and mortality.

METHODS

This study was done on "Maternal and Perinatal outcome of eclampsia in a tertiary care centre" (SCB MCH) from January 2013 to September 2014. The study was conducted in Obstetrics and Gynecology Department, SCB Medical College Cuttack, Odisha, India. The present study aims to determine the factors affecting the maternal and perinatal outcome of eclamptic mothers. Women with other causes of convulsions were excluded.

It was an observational study. Patients with eclampsia were admitted through emergency. Inclusion criteria was the patients developing eclampsia in second half of pregnancy or within ten days after delivery; and exclusion criteria was patients with convulsion due to epilepsy, cerebral cause, malaria or any other metabolic cause and patients presenting ten days or more after delivery.

A detailed history was taken from attendants or from patient (if conscious and well oriented in time and space), regarding gestational age, or time passed after delivery, number of convulsion and their nature, history of raised blood pressure, proteinuria, swelling of feet, headache, epigastric pain, visual disturbances, vomiting, urinary problem or bleeding per vaginum. A thorough general physical and systemic examination was performed, recording blood pressure, pulse, temperature, edema, jaundice and pallor. Lungs and heart were auscultated to note any abnormalities. Reflexes were checked. Obstetrical examination included abdominal examination to determine lie and presentation of fetus, amount of liquor, any element of intrauterine growth retardation and fetal heart rate (if alive). Vaginal examination performed to note degree of cervical dilatation, effacement, station of presenting part and pelvic capacity. Mode of delivery (vaginal / abdominal route) was decided according to the bishop score, patient's condition and fetal condition. After delivery patients were observed in intensive care unit for 24-48 hours and patients were followed up for complication for up to ten days. All of these information's were recorded on a Performa. Lab investigations included: Blood group and Rh factor, complete blood examination, platelet count, serum electrolytes, serum urea, serum creatinine, serum uric acid, liver function tests, complete urine analysis, 24 hours urinary protein estimation and Ultrasonography.

Ethical clearance has been taken from Institutional Ethical committee. Informed consent was taken from every patients who had taken part in the study.

RESULTS

During the study period there were 218 women with eclampsia among 15677 deliveries (1 in 72 deliveries). The incidence of eclampsia in SCB Medical College during the study period was 1.39%. All these patients were treated with magnesium sulphate by Prichard regime. 98% were unbooked, 6 (2.75%) gave previous history of PIH and 2 (0.92%) gave history of eclampsia. It is important to note that the classic triad used to diagnose pre-eclampsia was not present in all women with eclampsia. 3.21% cases were between 15-19 years of age, 63.30% cases were between 20-24 years of age, 26.61% were between 25-29 years of age, 6.42% were between 30-34 years of age and 0.46% cases were of 35 years and above. 83.48% cases were primigravida, 11.92% were second gravidae, 1.37% were third gravidae and 3.23% of cases were fourth gravidae and above.

74.31% cases were antepartum, 14.22% were intrapartum and 11.43% were postpartum. 5.50% of cases were between 20-28 weeks of gestation age, 22.03% of cases were between 29-34 weeks of gestation, 43.12% were between 35-37 weeks, 25.23% were between 38-40 weeks and 4.12% were >40 weeks of gestation. 15.60% of cases had regular ANC, 40.36% had irregular ANC and 44.04% had no ANC. 97.25% of cases were from rural area and 2.75% were from urban area. 37.61% of cases were illiterate, 27.08% had primary education, 31.19% had high school education, 1.83% had plus two education and 2.29% were graduate. 83.94% of cases were from lower socioeconomic status, 15.14% of cases were from middle socioeconomic status and 0.92% of cases from upper socioeconomic status. 62.39% of the cases were referred from specialist, 30.28% referred from FRU and 7.33% were not referred. 44.04% cases were conscious during admission, 49.08% were conscious but disoriented and 6.88 were unconscious.

Table 1 shows 47.25% had systolic blood pressure >160 mmHg, 31.19% had between 140 and 160 mmHg, 20.18% had <140 mmHg and 1.38% SBP not recordable. There were a higher numbers of maternal deaths when SBP was more than 160 mmHg.

Table 2 shows 35.32% of had diastolic blood pressure >110 mmHg, 44.03% had between 90-110 mmHg, 19.27% had <90 mmHg and 1.38% DBP not recordable. There were a high number of maternal deaths when DBP was more than equal to 110 mmHg.

Table 3 shows there was higher maternal death associated with more proteinuria.

Table 4 shows that in primigravida the case fatality rate was 3.84% and for multigravida the case fatality rate was 16.67%. Overall maternal mortality was 5.96%.

Table 1: Systolic blood pressure at the time of admission.

Blood pressure (mmhg)	No. of cases	Percentage (%)	Maternal death
>160	103	47.25	6
140-160	68	31.19	1
<140	44	20.18	3
Not recordable	03	1.38	3
Total	218	100	13

Table 2: Diastolic blood pressure at the time of admission.

Blood pressure (mm hg)	No. of cases	Percentage (%)	Maternal death
>110	77	35.32	4
90-110	96	44.03	5
<90	42	19.27	1
Not recordable	03	1.38	3
Total	218	100	13

Table 3: Degree of proteinuria at the time of admission.

Urine albumin	No. of cases	Percentage (%)	Maternal death
4+	63	28.90	6
3+	71	32.57	5
2+	57	26.15	2
1+	19	8.72	0
Negative	08	3.66	0
Total	218	100	13

Table 4: Maternal mortality in relation to parity.

Parity	No. of cases	No. of deaths	CFR (%)
Primigravida	182	7	3.84
Multigravida	36	6	16.67
Total	218	13	5.96

Maternal outcome

There were 13 maternal deaths out of 218 eclampsias. six died undelivered, 46.33% of cases delivered vaginally, 3.21% delivered vaginally with instrumentation and 47.70% delivered by Caesarean section. For primigravida the case fatality rate was 3.84% and for multigravida the case fatality rate was 16.67%.

Table 5 shows in antepartum eclampsia the case fatality was 6.79%, for intrapartum eclampsia it was 3.22% and for postpartum eclampsia it was 4%. The overall case fatality for eclampsia was 5.96%.

Table 6 shows that 61.54% of the deaths had >4 convulsions and 38.46% had 1-3 convulsions.

Table 5: Maternal mortality in relation to type of eclampsia.

Type of eclampsia	No. of cases	No. of deaths	CFR (%)
Antepartum	162	11	6.79
Intrapartum	31	1	3.22
Postpartum	25	1	4.0
Total	218	13	5.96

Table 6: Maternal mortality in relation to no. of convulsion.

No. of convulsion	No. of deaths	Percentage of deaths
1-3	5	38.46
>4	8	61.54
Total	13	100

Table 7: Causes of maternal mortality in eclampsia.

Cause of death	No. of cases	Percentage (%)
Cerebral hemorrhage	1	7.69
Pulmonary edema	6	46.17
Acute renal failure	1	7.69
PPH with shock	2	15.38
DIC	2	15.38
Cardiac failure	1	7.69
Total	13	100

Table 8: Maternal morbidity due to eclampsia.

Morbidities	No. of cases	Percentage (%)
Cerebral hemorrhage	6	2.75
Pulmonary edema	18	8.25
Acute Renal failure	30	13.76
Shock	12	5.50
Hellp syndrome	10	4.59
Jaundice	17	7.80
Cardiac failure	2	0.91
Septicemia	18	8.25
Pyrexia	34	15.60
PPH	28	12.84
DIC	14	6.42
ARDS / aspiration pneumonia	2	0.91
Abruptio placentae	15	6.88
Acute hepatic failure	4	1.83
Retinal oedema, blindness	8	3.67

Table 7 shows different causes of maternal mortality in eclampsia.

Table 8 shows different maternal morbidity due to eclampsia.

Table 9 shows that 69.23% of maternal death occurred before 12 hours, 7.69% between 13-24%, 15.38% between 25-48 hours and 7.69% more than 48 hours of admission.

Table 10 shows that LSCS deliveries had maternal death rate 0.96% and perineal mortality rate 16.35%. Vaginal deliveries had maternal death rate 5.56% and perinatal mortality rate 42.59%.

Table 9: Admission death interval.

Duration (hours)	No.of deaths	Percentage (%)
<12	9	69.23
13-24	1	7.69
25-48	2	15.38
>48	1	7.69
Total	13	100

Table 10: Fetal and perinatal outcome depending upon the mode of delivery.

Mode of delivery	No.of cases	Maternal death		Perinatal deaths	
		No. of cases	(%)	No. of cases	(%)
LSCS	104	01	0.96	17	16.35
VD	108	06	5.56	46	42.59
Undelivered	06	06	-	-	-
Total	218	13		63	

Perinatal outcome

The 218 pregnancies resulted in 213 births (5 sets of twins, and 6 women died undelivered). There were 46 still births and 63 perinatal deaths for a total perinatal mortality of 31.50% which was largely due to birth asphyxia 11. It is important to emphasize that in 63 of the 207 cases of perinatal deaths the infants had birth weight of <1.5 kg. In addition 6 of the still births were due to congenital anomalies.

Table 11 shows that out of 218 cases, 206 cases were >28 weeks of gestation. Out of 206 cases 75.73% were live births, 21.35% were still birth and 2.92% of cases mother died before delivery.

Table 12 shows out of 218 cases 206 cases were >28 weeks of gestation. Out of 206 cases 74.75% were live births, 22.33% were still births and 2.92% (6 cases) mother died before delivery.

Perinatal mortality rate = still births + early neonatal deaths/Total no. of deliveries=46+17/200=31.50%

It shows total perinatal mortality rate is 31.50%. Still births accounts for 73.01% and early neonatal death accounts for 26.98% of total perinatal mortality.

Table 13 shows 38.83% of perinatal deaths occurred when maternal blood systolic pressure >160 mmHg, 41.55% when diastolic blood pressure >110 mmHg, 18.75% when blood systolic pressure <160 mmHg, 21.73% when diastolic blood pressure <110 mmHg.

Table 14 shows the relationship between urine albumin and perinatal outcome. Urine albumin more than 2⁺ had more perinatal deaths.

Table 15 shows 47.94% of perinatal deaths occurred when uric acid level more than 7.1, 27.27% deaths occurred when uric acid level between 5.6 to 7 and 9.30% perinatal deaths occurred when uric acid level less than 5.5.

Table 16 shows 9.20% babies had Apgar score between 0-4, 24.14% had Apgar score between 5-7 and 66.66% had Apgar score between 8-10.

Table 17 shows 27.27% of newborn were less than 1.5kg, 50.45% were between 1.6-2.5kg, 18.18% were between 2.6-3kg and 4.10% were more than 3 kgs.

Table 18 shows out of total live births 48.47% were preterm, 22.43% had IUGR, 17.95% had developed birth asphyxia, 3.20% developed HIE, 1.28% each developed IVH and septicaemia, 3.85% had developed jaundice and 1.92% had developed seizure.

Table 19 shows 36.84% of neonatal mortality due to prematurity, 57.89 % due to birth asphyxia and 5.26% due to IUGR.

Table 11: Perinatal outcome in eclampsia.

Outcome	No. of cases	Percentage (%)
Live birth	161	75.59
Still birth	46	21.60
Not delivered	6	2.81
Total	213	100

Table 12: Perinatal deaths in eclamptic patients.

Outcome	No of cases	Percentage (%)
Still birth	46	73.01
Early neonatal death	17	26.98
Perinatal death	63	100

Table 13: Blood pressure and perinatal outcome in eclampsia.

BP	No. of cases	Perinatal death	Percentage (%)
>160	103	40	38.83
<160	112	21	18.75
>110	77	32	41.55
<110	138	30	21.73

Table 14: Urine albumin and perinatal outcome.

Urine albumin	No. of cases	Perinatal death	Percentage (%)
4+	63	21	33.34
3+	71	27	38.03
2+	57	12	21.05
1+	19	2	10.52
Negative	08	1	12.05

Table 15: Uric acid level and fetomaternal outcome in eclampsia.

Uric acid level in mEq/dl	No of cases	Maternal death (%)	Perinatal death (%)
<5.5	86	0	8
5.6-7	55	1	15
>7.1	73	7	35

Table 16 : APGAR score at birth at 5 minutes in eclampsia.

APGAR score	No. of cases	Percentage (%)
0-4	16	9.94
05-07	42	26.09
08- 10	103	63.97
Total	161	100

Table 17: Birth weight of the babies.

Birth weight (kg)	No.of cases	Percentage (%)
<1.5	54	25.35
1.5-2.5	110	51.64
2.6 -3	40	18.77
>3	09	4.24
Total	213	100

Table 18: Risk factors associated with neonatal death.

Cause of death	No.of death	Percentage (%)
Preterm	7	36.84
Birth asphyxia	11	57.89
IUGR	1	5.26
Total	19	100

Table 19: Neonatal morbidity in eclampsia (total live birth 161).

Morbidity	No.of neonate	Percentage (%)
Preterm	83	51.55
IUGR	32	19.87
Asphyxia	28	17.39
HIE	5	3.10
IVH	2	1.24
Jaundice	6	3.72
Seizure	3	1.86
Septicemia	2	1.24

DISCUSSION

The incidence of eclampsia in our study was 13.9/1000 deliveries i.e. 1.39 %, which is less than that described by Rajashri et al (1.82%), more than Sunitha TH (0.7%).^{4,5} However, the incidence of eclampsia is much higher than that of developed countries like the United Kingdom (UK), where eclampsia complicates 0.05% of total deliveries.⁶ The incidence of eclampsia in Eastern India as quoted by Singh et al is 3.2% which is higher than ours.⁷ Eclampsia was more commonly seen in young pregnant women (66.5%) and primigravidas (83.48%) which is similar to a study done by Sunita TH et al (85% and 79%).⁵ 95% of patients of eclampsia in our hospital were not booked with us. 44% of patients had no antenatal care and around 40% of patients had some sort of antenatal care. Lack of antenatal care is one of the important risk factors for the development of eclampsia which is proved by many studies. 93.99% of patients had no ANC as per Jain S et al and 76.66% had no ANC as per Swain S et al.^{3,8} According to studies conducted in developed countries, the percentage of eclampsia considered to be unpredictable ranged from 31% to 87% and this is because of atypical presentation of eclampsia i.e. abrupt onset, development of convulsions while receiving prophylactic Mgso₄ or onset of convulsions after 48 hours of delivery or in patients without hypertension or proteinuria. But in developing countries, the preventable causes of eclampsia contribute to most cases of eclampsia because of poor ANC services. In our study 74.31% of eclampsia were antepartum, 14.22% were intrapartum and 11.47% were postpartum. In UK, 44% of eclampsia were postpartum and had lower incidence of antepartum eclampsia which could be due to good ANC surveillance. Pathogenesis of postpartum eclampsia is less understood.⁹ Eclampsia was seen in 49% of patients at term gestation in our study which is similar to a study done by Khanum M et al i.e. 53% at term gestation and 43% at near term gestation.¹⁰ 47% of patients had severe hypertension at presentation, 6 patients had normal BP recording at presentation. Mattar F et al quoted 16% of the patients had no hypertension, 20%-54% had severe hypertension and 30%-60% had mild hypertension. Hypertension is considered to be the hallmark for the diagnosis of eclampsia. The diagnosis of eclampsia is usually associated with proteinuria (at least 1+ on dipstick). In our series 29%

of patients had 4+, 33% had 3+, 26% had 2+, 9% had 1+ and 3.6% had negative which is similar to the study done by Mattar F et al.¹¹ Cesarean section was a common mode of delivery in our series (47%) which is similar to study done by Sibai BM et al.¹² Eclampsia per se is not an indication for cesarean section and mode of delivery had no significant effect on the outcome of the eclamptics as per Ibrahim A et al.¹³ The decision to perform cesarean section should be based on fetal gestational age, fetal condition, presence of labour, cervical Bishop score and maternal condition. Labour is usually induced with prostaglandins and early rupture of membranes and the obstetrician can monitor and await vaginal delivery once the patient is stable and convulsions are under control. Judicious and timely selection of cases for either vaginal delivery or cesarean section is going to improve the maternal and perinatal outcome. All our patients received MgSO₄ as per Pritchard's regimen to prevent convulsions. Only 4 patients had recurrence of convulsions while on MgSO₄ regimen. Recurrence of fits increases the maternal morbidity. Efficacy of MgSO₄ in prevention and treatment of eclamptic convulsions is time tested, however, protocols and dose of MgSO₄ are not evidence based and narrow therapeutic index and toxicity is still a major concern in clinical use. Pritchard regimen was formulated for women of the West with high BMI but he also suggested low dose in women with small body size.¹⁴ Witlin et al also recommended dose adjustment according to patients weight or body mass index.¹⁵ Low dose regimen proved to be effective in prevention and control of convulsions in our population similar to a study done by Bangal V et al.¹⁶ Delay in presentation to the hospital and more number of convulsions definitely adds to maternal morbidity and mortality. There are increased rates of maternal morbidities due to eclampsia. The most common causes of maternal death are intracranial bleeding, pulmonary edema and acute renal failure secondary to abruption placentae. There were 63 perinatal deaths due to eclampsia. The most common causes of perinatal death are fetal asphyxia, prematurity, fetal growth restriction and acidosis. According to the Royal College of Obstetricians and Gynaecologists (RCOG) good antenatal services will detect and treat preeclampsia and thus reduce the incidence of eclampsia. Prompt and timely treatment of eclampsia will reduce the maternal and perinatal morbidity and mortality.¹⁷

In our study Perinatal mortality was high in patients who had a systolic Blood Pressure of ≥ 160 mm of Hg, a diastolic Blood Pressure of $\geq 90-110$ mm of Hg, babies less than 2 kgs, urine albumin $>2+$. Perinatal mortality was low in those patients who had delivered within 6 hours of convulsion, in patients who delivered within 6 hours of commencement of treatment, babies delivered by caesarean section and in babies above 2 kgs.

Eclampsia is responsible for considerable maternal and perinatal mortality as well as maternal morbidity. Maternal morbidity includes severe bleeding from abruption placentae with its resulting coagulopathy, pulmonary edema, aspiration pneumonia, acute renal failure,

cerebrovascular haemorrhage and retinal detachment. Eclampsia continues to be an important cause of maternal and perinatal morbidity and mortality. This is due to lack of proper antenatal care, low socio economic condition and lack of education. Perinatal mortality and morbidity is another concern in eclampsia patients, as the definitive treatment demands termination of pregnancy.

The basic management aims in eclampsia include attaining control of convulsions, control of blood pressure and safe delivery within a reasonable period of time. Rational use of appropriate anticonvulsants along with safe delivery should be promoted for these patients at all health service levels. Referral to a better-equipped center when necessary should be accompanied by appropriate emergency obstetric care. Health education and public awareness regarding decision to seek care on time should be promoted at all levels.

CONCLUSION

The result of this present study indicates the great need for improved health education, as most cases of eclampsia were due to ignorance and neglect. There is also a need for expansion of education and training personnel in order to recognize the high risk factors diagnose and manage preeclampsia and eclampsia as early as possible so that the severe form of the disease is prevented.

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