2017

www.jmscr.igmpublication.org Impact Factor 5.84 Index Copernicus Value: 83.27 ISSN (e)-2347-176x ISSN (p) 2455-0450 crossref DOI: _https://dx.doi.org/10.18535/jmscr/v5i6.119



Journal Of Medical Science And Clinical Research An Official Publication Of IGM Publication

Maternal and Neonatal outcome in eclampsia in a tertiary care hospital in India

Authors

Dr Archana Kumari¹, Dr Shuchita Mundle², Dr Shalini Fuse³

¹Assistant Professor, ²Associate Professor, ³Professor and Head Department of Obstetrics and Gynaecology Government medical College, Nagpur Corresponding Author

Dr Shalini Fuse

Professor and Head, Dept of Obstetrics and Gynaecology Government Medical College, Nagpur

Abstract

Aims and Objectives: (1) To study the risk of eclampsia in relation to several maternal characteristics and exposures including socio-demographic and obstetrics characteristics, community and health facility support and to study maternal and neonatal outcome in eclampsia. (2) To study the association of eclampsia with Socio-demographic factors, antenatal care, obstetric factors and severity of disease, maternal and fetal outcome.

Study Design: This was a case control study of 110 cases of pregnant women admitted to the Obstetric ward with a diagnosis of eclampsia (Cases). The control group comprised of women admitted during the same time who did not have pre-eclampsia or eclampsia.

Materials and Methods: The study was carried out in the department of Obstetrics and Gynecologist at a tertiary care health institute. The study was a case control study of 110 cases of pregnant women having eclampsia. 110 pregnant women admitted during the same period who did not have eclampsia or preeclampsia were enrolled as control group. Study was approved by the ethical committee of the institute. Informed consent was taken. Demographic data and detailed history was noted. General and systemic examination was done. Type of delivery was noted. Patients were monitored during labor and evaluated in terms of convulsion delivery interval, hours of labor and mode of delivery and indication for cesarean section. Risk of eclampsia in relation to several defined maternal characteristic was studied along with the maternal and fetal outcome in studies cases. The data was analyzed by Epi INFO version 7.1. Qualitative data was expressed in percentages. Quantitative data was expressed in Mean +/- Standard deviation and Ranges were specified. Chi square / Fisher's exact test were used to observe the difference between proportions. Odds ratio were calculated at appropriate associations. P < 0.05 was considered significant.

Results: The analysis of educational status amongst the cases and control group revealed statistically significant difference (P=0.01). The number of skilled patients was more in control group than in cases and the difference was statistically significant (P=0.03). Eclampsia was seen more prevalent in cases coming from rural areas and having higher BMI values (P=0.01). Incidence of eclampsia was found to be more in unbooked cases, primigravida, women with gestational age more than 37 weeks and in those who had less than 3 ANC visits(P=0.01). Difference was statistically insignificant when the factors like singleton or multiple pregnancy and birth interval were analyzed. Majority of the patients (87.27) had convulsions in antepartum period and most of them experienced less than 5 episodes of convulsions. Most of the patients had convulsions

Dr Archana Kumari et al JMSCR Volume 05 Issue 06 June 2017

before reaching hospital. 57.2% patients reached health care facility within 2hours of seizures and 80.91% patients had a Glasgow coma scale of more than 10 at the time of admission. Systolic blood pressure of majority of the patients was between 140-160 mm of Hg and diastolic blood pressure was between 90-110 mm of Hg. 34.5% patients had 3+ albuminuria and 68.1% patients had brisk reflexes at the time of admission. There was no statistically significant difference in mode of delivery in controls and cases. Majority of the patients were delivered within 24 hrs of seizures. The most common complications seen in the patients with eclampsia were found to be postpartum hemorrhage (11.8%) followed by pulmonary edema (9%) and Acute renal failure (9%). The analysis of mortality patterns revealed that the most common cause of maternal mortality in studied cases was acute renal failure (5.4%) followed by pulmonary edema (4.5%) and

Postpartum hemmorhage, septicemia and ARDS. The analysis of fetal outcome revealed that most of the babies were low birth weight (<2.5 kg) and birth weight was normal only in 32.14% babies. There was no statistically significant difference of APGAR scores in babies of cases and control groups. The cases had a statistically significant higher incidence of number of low birth weight babies, Incidence of IUGR, preterm deliveries, stillbirths and neonatal mortality. Lastly poor perinatal outcome was associated most commonly with factors such as IUGR, prematurity and low birth weight.

Conclusion: Eclampsia is a serious risk to maternal health and fetal viability and is one of the important factors responsible for maternal and neonatal mortality and morbidity. Regular antenatal visits and controlling BMI in mothers can reduce incidence of eclampsia. Early intervention can reduce maternal and fetal complications. Prematurity, growth restriction and low birth weight are neonatal complications which can be seen in babies born to mothers with eclampsia.

Keywords: Eclampsia, Maternal and neonatal outcome, maternal mortality, Perinatal Outcome.

Introduction

Eclampsia is defined as the development of convulsions and/or coma unrelated to other cerebral conditions during pregnancy or in the post-partum period in patients with signs and symptoms of pre-eclampsia after 20 weeks of gestation ^[1].

It is a pregnancy specific disease characterized by convulsions associated with pre-eclampsia, sometimes progressing into a multi-organ disease, cluster of varying clinical features. Eclampsia occurs more commonly in the last trimester of pregnancy and becomes increasingly more frequent near term. Convulsions may occur antepartum (38%) intra-partum (18%) or post-partum (44%). Primigravida are at a higher risk of convulsions and antepartum convulsions are more dangerous than those beginning after delivery. The etiology of eclampsia is multifactorial. The risk factors for development of eclampsia include genetic predisposition, abnormal trophoblastic invasion, nulliparity, family or past history of preeclampsia and eclampsia, poor outcome of previous pregnancy, lower socioeconomic status, hydatiform mole, fetal hydrops, primigravida and multifetal gestation^[2]. Co-morbid conditions like

essential hypertension, renal diseases, diabetes mellitus and many autoimmune diseases (APLA, SLE etc) may also increase the risk of eclampsia ^[3]. The diagnosis of eclampsia is secure in the presence of generalized edema, hypertension, proteinuria, and convulsions. However, women in whom eclampsia develops exhibit a wide of signs, spectrum ranging from severe hypertension, severe proteinuria and generalized edema to absent or minimal hypertension, no proteinuria, and no edema ^[4]. Common signs and symptoms associated with eclampsia include persistent occipital or frontal headaches, blurred vision, photophobia, epigastric and/or right upperquadrant pain, and altered mental status ^[5]. Eclampsia can result in maternal mortality and

Eclampsia can result in maternal mortality and morbidity, including fairly severe morbidities such as HELLP syndrome (hemolytic anemia, elevated liver enzyme, and low platelet count), acute kidney injury, coma, pulmonary edema and disseminated intravascular coagulation^[6]. Although eclampsia is associated with an increased risk of maternal death in developed countries (0–1.8%) the mortality rate is as high as 14% in developing countries ^[7]. The high maternal mortality reported from the developing

countries was noted primarily among patients who had multiple seizures outside the hospital and those without prenatal care ^[8]. The incidence of eclampsia in India is probably ten times higher than in the West. This is mainly due to poverty, malnutrition and the lack of good antenatal care. It is important to detect asymptomatic, mild and moderate pregnancy-induced hypertension ^[9].

The only cure for eclampsia is delivery of baby and with it the placenta, which is the seat of the problem. It is likely that eclampsia will prevail until the etiology and treatment directed to this etiology is found. Management of seizures is usually done by giving drugs like magnesium sulphate and anticonvulsants like benzodiazepines, phenytoin, and phenothaizines, among which magnesium sulphate is the more commonly used drug ^[10].

The purpose of this study is to examine the risk of eclampsia in relation to several maternal characteristics and exposures which are important determinants of the maternal and neonatal outcome.

Materials and Methods

This study entitled was carried out in the department of Obstetrics and Gynecology, in a tertiary care center over a period of 18 months. It was a case control study. Patients admitted to the Obstetric ward with a diagnosis of eclampsia (cases) and women admitted during the same time who did not have pre-eclampsia or eclampsia (controls) were enrolled in this study.

Inclusion criteria

- **Cases:** woman with a diagnosis of eclampsia based on the following: convulsions and/or coma unrelated to other cerebral conditions during pregnancy or in postpartum period with signs and symptoms of pre-eclampsia.
- **Control:** Woman without pre-eclampsia/ eclampsia, random selection matched for age.

Pregnant women presenting with convulsions with the following

- Known case of epilepsy.
- Provoked seizures i.e. due to Meningitis, encephalitis, intracranial tumors

Data was collected using pre-designed proforma. For every case of eclampsia age matched control patient was taken. Demographic data was recorded. Patients were evaluated and thorough history was taken. Details about place of convulsion, number of convulsions, and interval of convulsions were noted. Detailed obstetric history and examination was done including antenatal history, gestational age, history regarding previous pregnancies, history of previous eclampsia or pre-eclampsia. Detailed menstrual history, family history and past history was noted including history of any major illness in past or major operation done in past. General examination, systemic examination, per abdomen examination is carried out including temperature, pulse, respiratory rate, blood pressure, body mass index. Delivery characters such as onset of labor, spontaneous or induced and cesarean section were noted. Patients were monitored during labor and evaluated in terms of convulsion delivery interval, hours of labor and mode of delivery and indication for cesarean section. The results were studied for maternal and perinatal outcome. The data was analyzed by Epi INFO version 7.1. Qualitative data was expressed in percentages. Quantitative data was expressed in Mean +/-Standard deviation and Ranges were specified. Chi square / Fisher's exact test were used to observe the difference between proportions. Odds ratio were calculated at appropriate associations. P < 0.05 was considered significant.

Observations and Results

In the present case control study, eclampsia patients were taken as cases (n=110) and age matched patients without pre-eclampsia/eclampsia were taken as controls (n=110). Mean age of patients is 23.85 ± 4.5 years with a median age of 22.5 years.

Fable 1	:	Age	distribution	of the	studied	cases
---------	---	-----	--------------	--------	---------	-------

Age (in years)	Cases	Controls	Percentage
≤ 20	29	29	26.3
21-25	52	52	47.3
26-30	20	20	18.2
≥30	9	9	8.2

Incidence of eclampsia was found to be highest between 21-25 years of age with 52 patients (47.3%). Youngest woman with eclampsia was aged 18 years whereas eldest was 38 years.

Table 2 shows the educational status of patients. Illiteracy was more common in women who were in the eclampsia group with a total 36 cases (32.7%) whereas only 14 (12.73%) women from the control group were illiterate. 26 (23.6%) eclamptic women had secondary education versus 33 (30%) from control group.

Table 2: distribution of patients according to education

Educational Status	Cases	Percentage	Controls	Percentage
Illiterate	36	32.7	14	12.73
Primary	29	26.3	35	31.82
Secondary	26	23.6	33	30.00
Higher	15	13.6	25	22.73
Secondary				
Graduate	4	3.64	3	2.73

When we consider educational status as uneducated (women with no education at all) versus educated (women with at least primary education) among cases and controls it was found that 36 (32.7%) patients were illiterate from eclampsia group versus 14(12.7%) patients from control group. 74(67.27%) patients from the eclampsia group were educated whereas the number was 96(87.27%) among the control group. This difference was statistically highly significant with p value = 0.01.

Amongst the cases of eclampsia majority of the patients were un-skilled or housewives (92.72%) while this percentage was 83.63% in control group. The difference was found to be statistically significant (P=0.03). Moreover most of the patients from cases came from rural areas (83%) while majority of the patients from control group came from urban areas (64%). The

difference was found to be statistically highly significant (P=0.01).

Analysis of BMI of cases and controls revealed that 23 (20.9%) women from eclampsia group had BMI \geq 30 at the time of admission versus 2(1.8%) women from control group. This data was statistically significant with p value= 0.01.

Table 3: Distribution according to BMI at thetime of admission.

BMI	Cases	Percentage	Controls	Percentage	
BMI (<30.00)	87	79.0	108	98.1	P =0.01
BMI (≥30.00)	23	20.9	2	1.8	$X^2 =$ 19.90, OR= 0.07

The number of booked cases amongst cases and controls were found to be 79 (71.81%) and 59 (53.63%). The difference was found to be statistically highly significant (P=0.01). The incidence of eclampsia was more in unbooked cases with a total of 79(71.8%) patients. Only 31(28.18%) cases of eclampsia were booked. Whereas in controls 51(46.36%) patients were booked and 59(53.63%) patients were unbooked. This data was statistically highly significant (P =0.01). Majority of the patients in eclampsia group were primigravida 83 (75.45%) with only 27 (24.55%) multigravida. Whereas in the control group there were 36 (32.73%) primigravida and 74 (67.27%) multigravida. This data was statistically significant (P = 0.01).

Mean gestational age in eclampsia patients was 35.4 ± 3.4 weeks and median gestational age of 36weeks. Least gestational age in eclampsia patient was 26 weeks and maximum gestational age was 40 weeks. There were 8(7.27%) patients from eclampsia group who had convulsions before 28 weeks of gestation. 44(40%) patients from eclampsia group had convulsions after 37weeks whereas 89(80.9%) women from control group had labor onset after 37 weeks. 11(10%) Cases convulsed post-delivery out of which 5 patients were referred as postpartum eclampsia. There were 21 (19%) women who had early onset eclampsia (eclampsia before 34 weeks of gestation).

There were 2(1.8%) women in the eclampsia group with twin pregnancy whereas none of the control group patients had multiple gestations. This data was statistically not significant with p value = 0.15. 13 (11.82%) patients from eclampsia group had birth interval less than 2 years versus 49(44.55%) among the control group. Also 1(0.91%) patient of eclampsia had birth interval more than 10 years whereas none of the control patients had birth interval more than 10 years. There were 4 (3.63%) patients from eclampsia group with birth interval more than 5 years versus 7 (6.36%) patients from control group.

Of all patients of eclampsia 96 ((87.27%)) had antepartum convulsions, 3 ((2.73%)) patients had intrapartum convulsions after onset of labor and 11(10%) patients had postpartum convulsions.



Figure 1 : Timing of seizures in eclampsia.

Out of the 110 cases of eclampsia 86 (78.18%) had less than 5 convulsions, 19 (17.27%) had 5-10 number of convulsions whereas 5 patients had more than 10 convulsions. The mean number of convulsions was 3 ± 2.2 , with maximum number of convulsions being more than 20 times.



according to number of convulsions.

There were 95(86.3%) patients who had first episode of convulsions at home whereas 15(13.6%) patients had first episode at a PHC, rural hospital, private hospital or tertiary care hospital i.e. at a health center.



Figure 3: Distribution of eclampsia patients according to the place of convulsions.

The analysis of the time taken by patients to reach nearest hospital post convulsions revealed that 63(57.2%) patients took less than 2 hours to reach hospital. 15(13.6%) patients convulsed in hospital and got immediate treatment. 32(29%) patients took more than 2 hours to reach the hospital.



Figure 4: Distribution of eclampsia patients according to the time taken to reach hospital after episode of convulsions.

Majority (80.91%) of the patients with eclampsia had a GCS of more than 10 at the time of admission. Mean GCS of eclampsia patients was around $12(11.9) \pm 1.9$ with minimum GCS of 8. **Table 4:** Systolic and Diastolic blood pressures in

the studied cases.

Blood Pressure (Systolic) mm of Hg	Case s	Percentag e	Blood Pressure (Diastolic) mm of	Case s	Percentag e
<140 ≥140- 160	21 61	19.0 55.4	<90 ≥90-110	21 78	19 70.9
>160	28	25.4	>110	11	10

Dr Archana Kumari et al JMSCR Volume 05 Issue 06 June 2017

Mean systolic blood pressure was 152 ± 21 mm of Hg in the eclampsia group. 100mm of Hg was the lowest systolic blood pressure whereas 220 mm of Hg was highest systolic blood pressure seen. 21(19%) patients had systolic BP less than 140 mm of Hg, 61(55.4%) patients had systolic BP between 140-160 mm of Hg and 28 (25.4%) patients had systolic BP more than 160 mm of Hg on admission. Mean diastolic blood pressure was 96 ± 14.5 mm of Hg in the eclampsia group. 60mm of Hg was the lowest diastolic blood pressure whereas 130 mm of Hg was highest diastolic blood pressure seen. 21(19%) patients had diastolic BP less than 90 mm of Hg, 78(70.9%) patients had diastolic BP between 90-110 mm of Hg and 11(10%) patients had diastolic BP more than 110 mm of Hg on admission.

There were 4(3.6%) patients who didn't have albuminuria whereas 25(22.7%) patients had albuminuria of +4. 29(26.36%) patients had +2 albuminuria and 38(34.5%) patients had +3 albuminuria at the time of admission.

ALBUMINURIA	NUMBER OF	PERCENTA
	PATIENTS	GE
NIL	4	3.6
Trace	3	2.7
1+	11	10
2+	29	26.36
3+	38	34.5
4+	25	22.73

Characteristic of deep tendon reflexes as seen in eclampsia patients at the time of admission was noted. 34(30.9%) patient had normal reflexes whereas 75(68.1%) had exaggerated (brisk) deep tendon reflexes. 1 (0.9%) patient had absent deep tendon reflex at the time of admission.



Figure 5 : Deep tendon reflexes in studied cases.

The analysis of mode of delivery amongst eclampsia and control group patients was done. There were 51(46.3%) patients who delivered through caesarean section in eclampsia group versus 48(43.64%) from the control group. 59(53.6%) eclamptic women delivered vaginally versus 63(56.36%) from the control group. This data was not statistically significant with p value = 0.684.

Table 6: Distribution of cases according to thetype of delivery.

Type Of Delivery	Cases	Percentage	Controls	Percentage	-
Normal Vaginal	59	53.6	62	56.36	$X^2 = 0.165$
Caesarean Section	51	46.3	48	43.64	P = 0.684

The analysis of the time interval between first episode of convulsion and delivery of baby showed that 17(15.4%) patients delivered within 6 hours of convulsions, whereas there were 16 (14.5%) patients who delivered after 24hours post first convulsion.



Figure 6: Distribution of patients according t convulsion-Delivery interval.

Various maternal complications seen in patients of eclampsia were studied. Most common complication seen was postpartum hemorrhage in 13(11.8%) patients, and maternal mortality was seen in 10 (9.0%) patients. **Table 7:** Maternal Complication seen in patients of eclampsia.

Complication	Number Of Patients	Percentage
Abruptio Placenta	7	6.3
Postpartum	13	11.8
Hemorrhage		
DIC	6	5.4
ARDS	3	2.7
Pulmonary Edema	10	9.0
Acute Renal Failure	10	9.0
Septicemia	8	7.2
Intracranial	5	4.5
Hemorrhage		

The analysis of mortality pattern of cases with eclampsia revealed that the most common cause of mortality in these patients was Acute renal failure followed by pulmonary edema, ARDS, septicemia, DIC and postpartum hemorrhage.



Figure 7: Causes of maternal mortality in studied cases.

Distribution of neonatal outcome in terms of birth weight showed that 22(19.6%) babies were of very low birth weight from eclampsia group versus only 9(8.18%) very low birth babies in control group. 22(19.6%) babies were between 1.5 to 2kg in eclampsia group versus only 5(4.08%) in control group. There were only 36(32.14%) babies from eclampsia group whose weight was above 2.5kg whereas there were 84(76.36%) babies above 2.5kg in control group. Mean birth weight in eclampsia group was 2.08 ± 0.7 kg versus 2.5 ± 0.5 kg in the control group.



Figure 8: distribution of birth weight of children in cases and controls.

Distribution of babies on basis of APGAR of the neonate at 1 minute after delivery was studied. It showed that 10(9.0%) babies had APGAR less than 6 at 1 minute in eclampsia group versus 5(4.5%) babies of control group. 86(78.1%) babies had APGAR more than 6 at 1 min versus 100 (90.9%) babies from the control group. This data excludes stillbirths. Mean APGAR at 1 minute among cases and controls was 6 ± 2.9 and 7.7 ± 2 respectively. This data was statistically not significant with p value = 0.12.

Table 8 : Distribution of neonates according toAPGAR at 1 minute.

APGAR Score	Cases (n=96)	Percentage	Controls (n=105)	Percentage	-
<6	10	9.0	5	4.5	P =0.12,NS
≥6	86	78.1	100	90.9	OR = 2.32 (0.76- 7.6)

		Cases	Percentage	Controls	Percentage	
Low Birth Weight	YES	60	61.82	19	17.27	P=0.01 OR=11.13
	NO	24	21.8	86	78.18	$X^2 = 54.56$
Preterm Birth	YES	31	28.18	18	16.36	X ² =9.49 P=0.01
	NO	53	48.18	87	79.0	OR=2.81
IUGR	YES	52	47.27	9	8.18	$X^2 = 41.94$ P=0.01 HS
	NO	58	52.73	101	91.82	OR=9.95
STILLBIRTHS	YES	16	14.54	5	4.55	$X^2 = 6.37$
	NO	94	85.45	105	95.45	P=0.01 OR=3.55
NEONATAL MORTALITY	YES	12	10.91	5	4.55	X ² =4.48 P=0.03
	NO	82	74.5	105	95.45	OR=3.05

Table 9: Distribution of Neonates according to the incidence of LBW, Prematurity and IUGR

Distribution of babies according to low birth weight (live births with birth weight less than 2.5kg), premature birth (< 37 weeks), intrauterine growth retardation, stillbirths and neonatal mortality was analyzed. 60(62.8%) babies were low birth weight in eclampsia group whereas only 19(17.27\%) babies from control group were low birth weight. This data was statistically significant with p value = 0.01. 31(28.1%) babies were preterm from the eclampsia group whereas there were only 18(16.36%) preterm birth in control group. In eclampsia group preterm induction was done by for immediate termination of pregnancy whereas in control group there was spontaneous **Table 10:** Balationship batwaen parimetal mortality onset of preterm labor. Stillbirths were excluded from the above table. This data was statistically significant with p value= 0.01.52(47.27%) babies from eclampsia group had intrauterine growth restriction as compared to only 9 (8.18%) IUGR babies in control group. This data was statistically significant with p value = 0.01. There were 16 (14.54%) stillbirths in eclampsia patients versus only 5 (4.55%) stillbirths in control group. This data was statistically significant with p = 0.01. There were 12 (10.91%) babies from eclampsia group who expired post-delivery versus 5(4.5%) babies from control group. This data was statistically significant with p value =0.03.

	Factors	Poor Perinatal Outcome (28)	Good Perin Outcome(3	atal P Value	Odds Ratio
	LBW (60)	12	48	P =0.1, NS	0.53
	Gestational age				(0.22-1.20)
	<32weeks (21)	13	8	P= 0.01, S	8.01
	22.2(l-a (25)	Q	27	$\mathbf{D} = 0.4$ NS	(2.83-22.70)
	33-30WKS (35)	8	27	P=0.4, NS	(0.31-2.08)
	>37wks (44)	5	39	P=0.01, S	0.23
	× /				(0.08-0.69)
	Preterm (31)	9	22	P = 0.3, NS	1.29
					(0.50-3.20)
	APGAR <6 (10)	5	5	P = 0.06, NS	OR = 0.89
			• •	T	(0.89-12.58)
	IUGR (52)	23	29	P =0.01, S	8.40
					(2.88-24.45)
al	outcome in	patients w	vith j	perinatal outcome.	This includes

Table 10: Relationship between perinatal mortality in eclampsia patients and predisposing factors

Lastly perinatal outcome in patients with eclampsia was studied. The various characteristics of eclampsia patients have been related to the poor perinatal outcome. This includes both stillbirths and neonatal mortality. 28(25.4%) patients had poor perinatal outcome

Dr Archana Kumari et al JMSCR Volume 05 Issue 06 June 2017

Discussion

This study was carried out in the department of Obstetrics and Gynecology, in a tertiary care center. The present study was conducted in order to assess the various risk factors associated with eclampsia and maternal and fetal outcome in such patients.

Incidence

During 1 year of study period total number of deliveries in our hospital was 11,678. Out of these 214 women had eclampsia which included antepartum, intrapartum and postpartum, giving the incidence of 1.8%. Choudhary P (2003) reported 2.4% incidence of eclampsia in his study. 1.2% incidence was reported by Tukur ^[11,12]. Jido (2012). Vijayasree et al (2015) reported incidence of 1.9%, Prabhakar G et al (2014) and Manjhusha P et al (2013) reported an incidence of 1% and 1.6% respectively ^[13,14,15].

Socio-demographic characteristics

The mean age of eclampsia patients was 23.84 \pm 4.5 years in the present study. 26.3% women were less than 20 years of age and 8% women were more than 30 years of age. 32.7% of the cases where illiterate whereas only 12.7% of the controls were illiterate. 7.2% eclamptic women were involved in skilled occupation which was 16.3% in the controls. Unskilled occupation of women was found to be associated with increased risk of eclampsia during pregnancy. 75.4% of eclamptic women were from rural areas versus 41.8% rural women in control group. BMI: 20.9% women from eclampsia group had BMI \geq 30 at the time of admission as compared to 1.8% women from the control group. Mean age of eclampsia patients in Sumaira Rauf et al (2014) was 23.5± 4.6 years. Also low mean age 19.5 ± 2 years was seen in study by Gaddi Suman S et al (2007) and high mean age of around 28.5 ± 6 years was seen in study by Tan K H, Yeo et al [16,17,18]

Sumaira Rauf et al (2014) and Faith Yego et al (2014) found that there were 21% and 23% illiterate women in their studies respectively who had eclampsia.

Faith Yego et al (2014) also found higher incidence of eclampsia in unemployed women (71%).

75% of the eclampsia patients were primigravida as compared to only 32.7% in the control group. Risk of eclampsia was found 6 times greater in primigravida relative to multigravida. 19.09% cases had eclampsia even before 34 weeks of gestation i.e. early onset eclampsia. 40% women had convulsions at term ^[19].

One woman had convulsions at 28 weeks of gestation, was unbooked with twin pregnancy. Both her babies were stillbirths.

There were two cases of twin pregnancy in the eclampsia group versus none in the control group. Among the multiparous women 3.6% of the eclampsia patients had a birth interval of more than 5 years as compared to 6.3% in the control group. The number of unbooked women was also higher in eclampsia group with total 71.8% whereas 53.6% control women were unbooked. Relative to the booked patients, unbooked patients had 7 times the odds of having eclampsia during pregnancy (OR 0.45, 95% CI 0.25-0.79; p=0.01). In the present study, majority of the women (71.3%) were unbooked. Unbooked pregnancy is a high risk factor for eclampsia as proved in various studies. Vijavasree et al (2015), Pal A et a (2011) and Tan K H et al (2006) had 64.3%, 77.5% and 64.3% unbooked cases respectively which was comparable with the present study ^[20]. In this study, 61.8% patients of eclampsia did not have any antenatal care or received inadequate care with less than three antenatal visits. The women who had less than 3 antenatal visits had 2 times greater risk of having eclampsia as compared to women having more than 3 antenatal visits (OR 0.3, 95% CI 0.2-0.6; p=0.01). Lack of antenatal care is one of the important risk factors for the development of eclampsia which is proved by many studies. 79.6% of eclampsia patients in the study done by Prabhakar G et al (2014) and 68.3% patients in that of Hem Kanta Sarma et al (2014), did not have regular ANC checkup $^{[21]}$.

Maternal outcome

33(30%) patients delivered after 12 hours of first convulsion whereas 16(14.5%) patients delivered after 24hours of first convulsion. 46.3% eclampsia patients had caesarean deliveries whereas there were 43.6% cesarean deliveries in control group. 46.3% patients underwent caesarean section in the present study. This was comparable with other studies like Prabhakar G et al (2014), Sumaira Rauf et al (2014) and Muhammad Jamil (2013) where it was 45.8%, 44.32% and 45% respecttively. Caesarean section was the predominant mode of delivery among eclamptic patients as reported by Hem Kanta Sarma et al (2014) and Juliana C et al (2014) with 91.6% and 88% respectively^[22].

Maternal complications

11.8% cases went into postpartum hemorrhage which was similar to Sumira Rauf et al (2014) with 10.3%, whereas only 2.6% patients had postpartum hemorrhage in study by Jamil (2013). 5.4 % had DIC in the present study whereas Sunita Desai et al (2013) and Kaur (2012) reported 4% and 3% cases of DIC in their studies respectively. In the present study 9% cases developed pulmonary edema. 6.5% and 12.4% patients developed pulmonary edema in other studies like Prabhakar G et al (2014) and Sumira Rauf et al (2014) respectively. 9% cases developed acute renal failure which was comparable with Sumira Rauf et al (2014) study 4.5% cases had intracranial with 8.2%. hemorrhage in present study. Kaur (2012) and Sunita Desai et al (2013) reported 4% and 2% cases of intracranial hemorrhage in their respective studies. Maternal mortality was 9% in present study. This high mortality is attributed to the fact that most patients were having inadequate/ no antenatal care and arrived in very bad condition. The various complications occurred which lead to maternal mortality included pulmonary edema (4.5%), postpartum hemorrhage (2.7%), acute renal failure (5.4%), abruption (1.8%), intracranial hemorrhage (1.8%), DIC (2.7%), septicemia (2.7%) and ARDS (2.7%).

Most deaths were due to combination of various complications. This was similar to other studies like Vijayasree et al (2015), Sumaira Rauf et al (2014) and Tan K H et al (2006) with 9.1%, 7.2% and 9.1% respectively ^[23,24].

Neonatal Outcome

In the present study there were 61.8% babies who were low birth weight which was similar to Juliana et al (2014) and Manjusha et al (2013) with 62.5% and 52.1% respectively. 28.1% babies were preterm in the present study which was low as compared to other studies like Prabhakar G et al (2014) and Manjusha et al (2013) where it was 50% and 69.5% respectively. 47.2% babies had intrauterine growth restriction (IUGR) in the present study whereas only 27.2% babies were IUGR in study by Anita et al (2013). There were 14.5% stillbirths in the present study. Similarly the number of stillbirths seen in Prabhakar G et al (2014) and Juliana et al (2014) with 17.7% and 16% respectively. Neonatal mortality in our study was 10.9% and perinatal mortality was 25.4% which was comparable with other studies like Prabhakar G et al (2014) with 29.5%, Juliana et al (2014) with 21.7% and Anita et al (2013) with 25.4% ^[25].

Conclusion

Eclampsia is a serious risk to maternal health and fetal viability and is one of the important factors responsible for maternal and neonatal mortality and morbidity. Our study concludes that regular antenatal visits and controlling BMI in mothers can reduce incidence of eclampsia. Early intervention can reduce maternal and fetal complications. Prematurity, growth restriction and low birth weight are neonatal complications which can be seen in babies born to mothers with eclampsia.

Conflict of Interest: None

References

 Pre-eclampsia. Sibai B, Dekker G, Kupferminc M Lancet. 2005 Feb 26-Mar 4; 365(9461):785-99.

2017

- Bilano VL, Ota E, Ganchimeg T, Mori R, Souza JP. Risk Factors of Pre-Eclampsia/Eclampsia and Its Adverse Outcomes in Low- and Middle-Income Countries: A WHO Secondary Analysis. Young RC, ed. PLoS ONE. 2014;9(3):e91198.
- Iozza I, Cianci S, Di Natale A, et al. Update on systemic lupus erythematosus pregnancy. Journal of Prenatal Medicine. 2010;4(4):67-73.
- Sibai B M.Eclampsia .VI. Maternalperinatal outcome in 254 consecutive cases. AmJ Obstet Gynecol 1990; 163: 1049–55.
- Hosley CM, McCullough LD. Acute Neurological Issues in Pregnancy and the Peripartum. The Neurohospitalist. 2011;1(2):104-116.
- Zhang J, Meikle S, Trumble A. Severe maternal morbidity associated with hypertensive disorders in pregnancy in United States, Hypertension in Pregnancy 2003; 22:203-12
- MacKay A P, Berg C J, Atrash H K. Pregnancy-related mortality from preeclampsia and eclampsia. Obstet Gynecol 2001; 97:533–8.
- Katz V L, Farmer R, Kuller J. Preeclampsia into eclampsia: toward a new paradigm. Am J Obstet Gynecol 2000; 182: 1389–96.
- N. Hinduja, J. Shah, V. P. Singh K.E.M. Hospital, Parel. Eclampsia in India. The National Medical Journal of India 1991; VOL. 4, NO.4 pg 170-174
- Moller B, Lindmark G. Eclampsia in Sweden, 1976–1980. Acta Obstet Gynecol Scand 1986; 65:307–14.
- 11. Choudhary P. Eclampsia : a hospital based retrospective study Medical Journal (2003) Vol. 1, No. 4, Issue 4, 237-241
- 12. Tukur A Jido. Ecalmpsia: maternal and fetal outcome. African Health Sciences 2012; 12(2): 148 152

- 13. Dr. M. Vijayasree. M.D., OBG., and Dr. G. V. Murali., Mch. A Clinical study of perinatal and maternal complications in Eclampsia in a tertiary care Referral Centre – A Near Miss Obstetric International Journal catasthrope. of Advanced Multidisciplinary Research (2015): 2(4): 80-85
- 14. Dr Prabhakar Gawandi, Dr Mrs. M A Shinde, Dr C A Jadhav (2014) Clinical study of eclampsia patients. IOSR Journal of Dental and Medical Sciences Volume 13, Issue 7 Ver. VI (July. 2014), PP 10-16
- 15. Manjusha S, Vandana N, Goutham R, Sneha M, Atmaram PP. Eclampsia: A Retrospective Study in a Tertiary Care Centre. i:1–5.Indian Journal of Pharmacy Practice Association of Pharmaceutical Teachers of India 2013; 6(1):69-73.
- 16. Qureshi SR, Zaheer S, Channa SR. Eclampsia; maternal morbidity and mode of delivery in the management. Professional Med J 2014; 21(4): 628-632.
- 17. Gaddi Suman S, Somegowda. Maternal and perinatal outcome in eclampsia in a district hospital, Vijayanagar. Institute of Medical Sciences, Bellary. J Obstet Gynecol India Vol. 57, No. 4 : July/August 2007; 324-326
- 18. Tan K H, Kwek K, Yeo G S H. Epidemiology of pre-eclampsia and eclampsia at the KK Women's and Children's Hospital, Singapore. Singapore Med J 2006; 47(1): 48
- 19. Faith Yego, Catherine D'Este, Julie Byles, Jennifer Stewart Williams and Paul Nyongesa. Risk factors for maternal mortality in a Tertiary Hospital in Kenya: a case control study. Yego et al. BMC Pregnancy and Childbirth 2014, 14:38
- 20. Pal A, Bhattacharyya R, Adhikari S, Roy A, Chakrabarty D, Ghosh P, Banerjee C Department of Gynecology & Obstetrics, Burdwan Medical College, Burdwan, Department of Community Medicine,

Medical College, Kolkata, WBHS. Bangladesh Med Research Council 2011; 37: 66-70

- 21. Dr Prabhakar Gawandi, Dr Mrs. M A Shinde, Dr C A Jadhav (2014) Clinical study of eclampsia patients. IOSR Journal of Dental and Medical Sciences Volume 13, Issue 7 Ver. VI (July. 2014), PP 10-16
- 22. Giordano JC, Parpinelli MA, Cecatti JG, Haddad SM, Costa ML, et al. (2014) The Burden of Eclampsia: Results from a Multicenter Study on Surveillance of Severe Maternal Morbidity in Brazil. PLoS ONE 9(5): e97401.
- 23. Kaur P. A Clinical Study on Eclampsia in a Referral Hospital. J South Asian Feder Obst Gynae 2012; 4(2):113-115.
- 24. Sunita T.H., Rathnamala M .Desai, SDM medical college and hospital, Sattur, India. Eclampsia in a Teaching Hospital: Incidence, clinical profile and response to Magnesium Sulphate by Zuspan's regimen. (Jan- Feb. 2013), IOSR Journal of Dental and Medical Sciences e-ISSN: 2279-0853, p-ISSN: 2279-0861. Volume 4, Issue 2, PP 01-05
- 25. Anita. Bhalerao A, Kulkarni S, Ghike S, Kawthalkar A, Joshi S, Somalwar S. Eclampsia: Maternal and Fetal Outcome. J South Asian Feder Obst Gynae 2013; 5(1): 19-21