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RESEARCH ARTICLE
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TO STUDY MATERNAL & FETAL OUTCOMES IN CASE OF ECLAMPSIA- A SINGLE CENTER STUDY.

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abstract-

Background - Eclampsia is defined as the onset of convulsions or coma during pregnancy or post-partum in a patient who has signs and symptoms of preeclampsia. Eclampsia is a life-threatening emergency that continues to be a major cause of serious maternal morbidity and is still the leading cause of maternal mortality worldwide.

Aims- To study maternal & fetal outcomes in case of eclampsia- a single center study.

Materials and methods- The proposed study is a prospective study centered in Obstetrics & Gynecology Department RIMS, Raipur during the term between January 2023 to June 2024 in total 50 patients. Pregnant women who have been diagnosed with eclampsia with more than 20 weeks of gestation and up to 42 days postpartum coming to hospital. Pregnant women with medical complications like: Pre-existing hypertensive, Diabetes, Renal disease and Pre-existing liver disease ets are excluded. Statistical analysis has been done using Chi-square test by SPSS software. Result (both perinatal and maternal deaths) are presented as number and percentage.

Results- The present study shows prevalence of Eclampsia is 0.9 % at our tertiary care center. Majority of the cases with Eclampsia were detected in age group of 20-25 year (58 %). Eclampsia was more common in primiparous patient (76%) which belonged to lower socio- economic status (94%). 9 were having high risk factor out of which 4 were past history of PIH, 2 had family history of eclampsia, 2 were obese, and one had profound hypertension. Eclampsia was more prevalent in antepartum cases (84%) followed by postpartum period (10%). Majority of women with eclampsia were between gestational age of 33-36 week (48%). 11 patients developed complication which was 31% due to PPH, 25% due to DIC, 19% due to HELLP, 13% due to Pulmonary edema ,6% due to PRES, 6% due to ARF. Mortality rate was 4%. Reason of death ARF and pulmonary edema.

Total live birth rate amongst 50 eclampsia patient was 100% out of which majority of them weighed between 2.1 - 2.5 kg and majority of them had APGAR score >7 (50%). Of all 100 % live births, 58% neonates needed NICU admission, of which 11% of neonates died majority of died (73%) due to RDS. Most of mortality occurs in less than 1 kg baby weight. Out of 27 babies complicated in eclamptic deliveries most common complication was RDS and LBW. Of all eclampsia patients, all were given MgSO4 therapy out of which 94% responded well and 6% presented with repeated convulsion which were managed by Levetiracetam. Only 2 patients developed gluteal abscess after mgso4 treatment.

Conclusion- Early attention and intensive management are essential for improving the maternal and fetal outcome in eclamptic cases. Unless the social and educational status of women are uplifted and obstetric care is brought to the doorstep, no miracle can be expected. A moderate reduction of death of

mother and fetus in our institution was possible due to wider use of magnesium sulphate, timed delivery, proper implementation of emergency obstetric care facilities to mother with eclampsia.

Keywords- eclampsia, magnesium sulphate, low birth weight.

Introduction- The term "eclampsia" is derived from a Greek word meaning "like a flash of lightening" in the sense of sudden event and dates back to seventeenth century. Eclampsia is perceived as the end of linear spectrum that stretches from the normal pregnancy through mild gestational hypertension, pre-eclampsia finally eclampsia. [1]

Eclampsia is defined as the onset of convulsions or coma during pregnancy or post-partum in a patient who has signs and symptoms of preeclampsia. Eclampsia is a life-threatening emergency that continues to be a major cause of serious maternal morbidity and is still the leading cause of maternal mortality worldwide. [2,3] Complicated cases and mismanaged cases are responsible for most maternal deaths, which are usually due to intracerebral hemorrhage, pulmonary edema, or renal, hepatic, or respiratory failure.' In addition, its presence is usually associated with high perinatal mortality and morbidity. The main causes of perinatal mortality and neonatal morbidity from eclampsia are preterm delivery, fetal growth retardation, and abruptio placentae. [4,5]

WHO estimates the incidence of preeclampsia to be seven times higher in developing countries (2.8% of livebirths) than in developed countries (0.4%). A preeclamptic woman in a developing country is three times more likely to progress to eclampsia than a woman in a developed country. WHO estimates that eclampsia develops in 2.3% of preeclamptic women in the developing world, compared with 0.8% of preeclampsia cases in developed countries. Eclampsia is associated with elevated maternal and fetal morbidity and mortality. [6,7,8]

The World Health Organization (WHO) estimates that at least 16% of maternal deaths in developing countries result from preeclampsia and eclampsia. Approximately 63,000 pregnant women die every year because of these conditions. Preeclampsia/eclampsia ranks second only to hemorrhage as a specific, direct cause of death. [9, 10]

The present study was undertaken to analyses the incidence of eclampsia, to assess the maternal and fetal outcome in patients of eclampsia and to evaluate various factors influencing this outcome, so that preventive measure could be suggested.

Aims- To study maternal & fetal outcomes in case of eclampsia- a single center study.

Materials and methods-

The proposed study is a prospective study centered in RIMS, Raipur, during the term between January 2023 to June 2024.

Study Design: - Prospective Cohort Study

Sample Size: -50 indoor patients

Study Place: - Obstetrics & Gynecology Department, RIMS, Raipur

Duration of study: - January 2023 to June 2024

Inclusion Criteria: -

- Pregnant women who have been diagnosed with eclampsia with more than 20 weeks of gestation and up to 42 days postpartum coming to hospital.

Exclusion Criteria: -

- Pregnant women with medical complications like:
- Pre-existing hypertensive
- Diabetes
- Renal disease
- Pre-existing liver disease
- Vascular disease
- Anemia

- Multiple gestation
- Polyhydramnios
- GTN (Gestational trophoblastic neoplasia)

Treatment approach-

(1) General nursing care, fluid and electrolyte balance were maintained, urine output was monitored with an indwelling catheter.

(2) Medical Management:

(a) Anticonvulsants:

To keep the patient sedated and to prevent convulsions, $MgSo^4$ therapy was used (Pritchard's regimen)- 4gms of $MgSo^4$ in 20ml of normal saline was given intravenously slowly over a period of 15-20 minutes and 5 gm $MgSo^4$ deep intramuscular in both buttocks given and therapeutic level was maintained 5 gm $MgSo^4$ deep intramuscular 4 hrly in alternative buttocks and it was continued for 24 hrs following delivery or last convulsion whichever is earlier. The toxicity signs of MgSo4 were carefully monitored like; absence of patellar reflex, decreased respiratory rate (less than 14/min), decrease in the urine output (less than 100ml in 4hrs). If any signs of toxicity were found, $MgSo^4$ infusion was stopped and antidote injection i.e., calcium gluconate, 1gm slow IV was given.

Levetiracetam:

Indication: if convulsion persisted even after MgSo4 infusion according to Pritchard regimen.

Dose: Levetiracetam loading dose of 1 gm iv in 100ml normal saline slowly given after loading dose 500 mg iv 12hrly given as a maintenance dose to control convulsion.

(b) Antihypertensive:

Drug of choice of antihypertensive treatment is labetalol given as IV 20 mg diluted in 10 cc ns over 5 minutes, take repeat blood pressure after 20 minutes if blood pressure is more than 150/100 mmHg give repeat dose of injection labetalol once blood
pressure is under 150/100 mmHg oral form of labetalol is given which is of 200 mg dose. After 20 minutes if blood pressure is higher than 150/100mmHg then repeat IV doe of labetalol can be given.

(c) Antibiotics:

Routine injectable antibiotic injection Ceftriaxone 1 gm iv given 12 hrs a part if WBC count is under 20000 /cumm if WBC is higher than 20000/cumm then injection piptaz 4.5gm can be given.

(3) Obstetric Management:

An attempt was made in each case after the control of fits to find out, if the patient was in labor and if in labor, how far advanced. If not in labor, whether the cervix was favorable for induction. If the cervix was favorable and the CPD was ruled out, labor was induced with either, syntocinon drip, ARM, prostaglandin E1 etc., and patient was allowed for vaginal delivery.

Second stage is shortened by assisting the delivery by vacuum extractor. Lower segment caesarean section is done for eclampsia perse in cases of status eclampticus and if the convulsions recur or are not controlled in 10-12hrs after starting the treatment.

Statistical analysis-

Statistical analysis has been done using Chi-square test by SPSS software. Result (both perinatal and maternal deaths) are presented as number and percentage.

Good outcome: Both survived

Bad outcome: Either maternal or paternal death occurred.

Observations and results-

We studied 50 adult patients of eclampsia of which most of the patients were brought to the Labor room or admitted and following observations were found. The highest number of patients with eclampsia were from age group of 21 to 25 [38%]. In my study out of 50 total patients 47 were belong to lower soci-economic class.

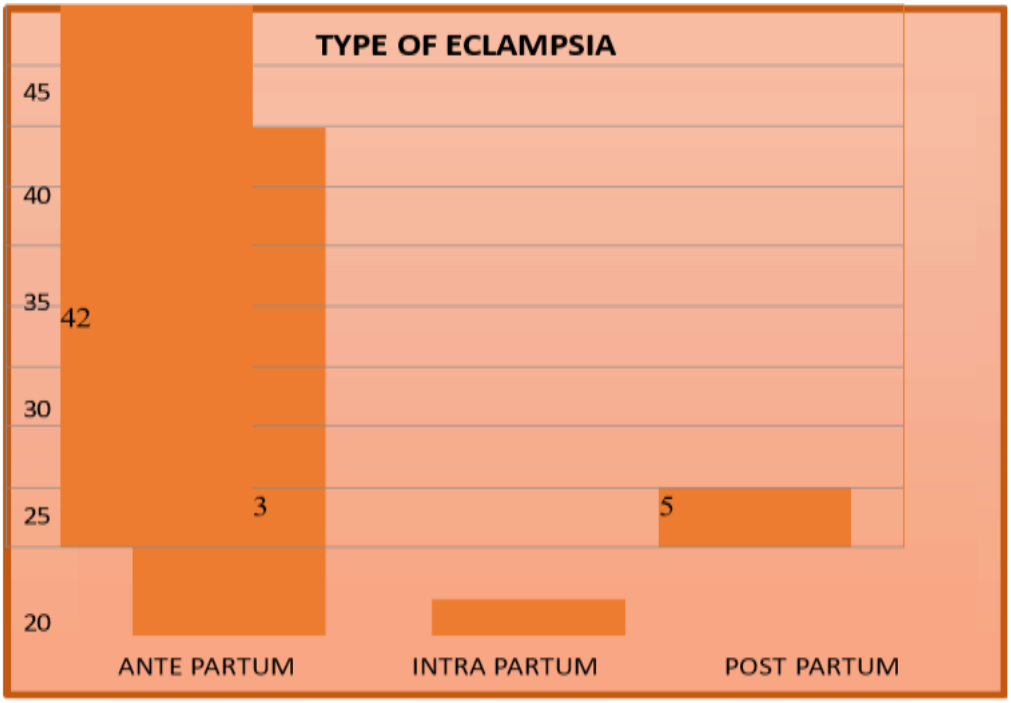
TABLE: 1 MATERNAL RISK FACTOR

MATERNAL RISK FACTOR	PERCENTAGE
PREVIOUS PIH	4(8%)
FAMILY H/O ECLAMPSIA	2(4%)
PROFOUND HYPERTENTION	1(2%)
OBESITY	2(4%)
NO RISK FECTOR	41(82%)
TOTAL	**50(100%)**

Out of 50 patients, 9 had known risk factors for hypertensive risk factors for pregnancy out of which maximum (8%) had previous history of pregnancy induced hypertension, 4% had family history of eclampsia, 2% had profound hypertension and 4% had obesity.

Number of patients with eclampsia and its relation with parity, maximum patient with eclampsia were primi gravida.

GRAPH: 1 TYPE OF ECLAMPSIA



Graph No. 1 is showing classification of eclampsia by onset of fits antepartum eclampsia contributes to 42 out of 50 patients while 3 had intra partum and 5 had post-partum period

TABLE: 2A SYSTOLIC BLOOD PRESSURE

SYSTOLIC BP	NO. OF PATIENTS	PERCENTAGE
<140	2	4%
141-150	13	26%
151-160	15	30%
161-170	12	24%
171-180	6	12%

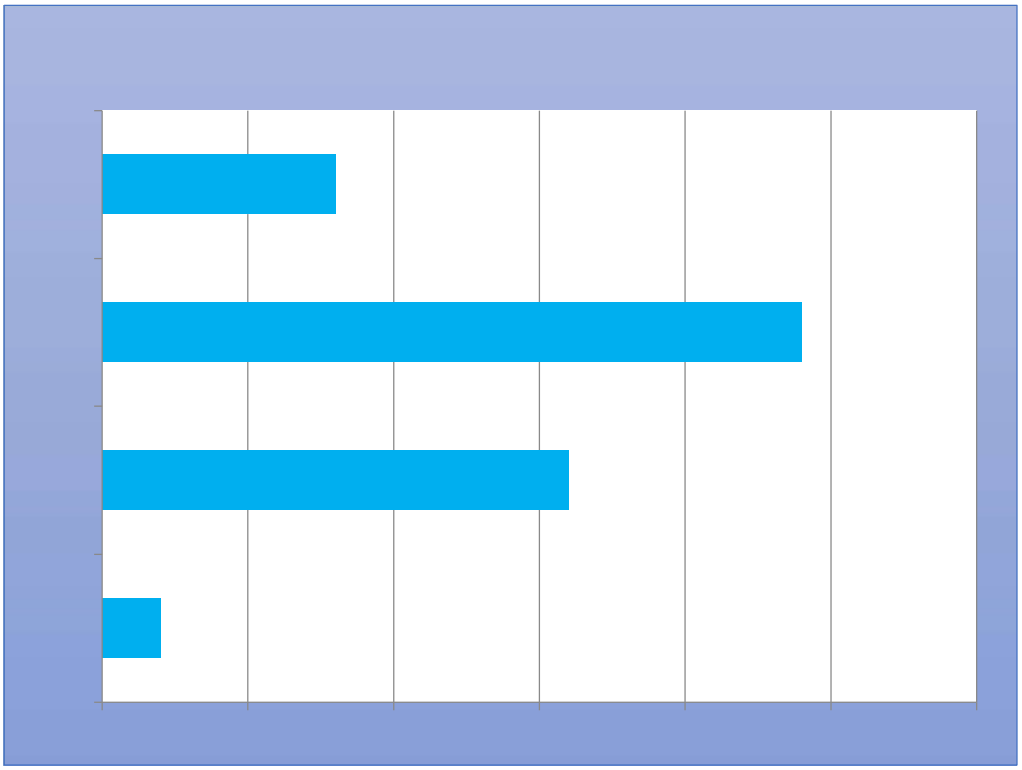
>181	2	4%

TABLE: 2B DIASTOLIC BLOOD PRESSURE

DIASTOLIC BP	NO. OF PATIENTS	PERCENTAGE
<90	3	6%
91-100	6	12%
101-110	27	54%
111-120	10	20%
121-130	4	8%

Table No. 2A, 2B are showing systolic and diastolic blood pressure on time of admission high chance of eclampsia at diastolic blood pressure of >100mmhg and systolic blood pressure of >150mmhg in my study.

GRAPH: 2 GESTATIONAL AGES



Graph No. 2 are showing gestational age of the patient on time of admission gestational age of 24 patient was in between 33 to 36 weeks in my study

TABLE: 3 MATERNAL COMPLICATIONS

MATERNAL COMPLICATION	NO.	PERCENTAGE
PRES	**01**	**02%**
DIC	**04**	**08%**
ACUTE RENAL FAILURE	**01**	**02%**
PULMONARY EDEMA	**02**	**04%**
HELLP	**03**	**06%**
PPH	**05**	**10%**
NO COMPLICATION	**34**	**68%**
TOTAL	**50**	**100%**

Graph No.3 is showing out of 11 patients that developed complications, 05 developed PPH, 04 developed DIC, 03 developed HELLP, 02 developed pulmonary edema, 01 developed acute renal failure, 01

developed PRES. Out of 2 mortalities in my study all mortality was happened in lower socioeconomic class.
Maternal mortality in cases of eclampsia which is roughly 4 % in my study. Cause of death which is due to pulmonary edema and acute renal failure.
Mode of delivery of the patient in my study there is 30 LSCS and 20 vaginal deliveries occur no any instrumental delivery.

TABLE: 4 INDICATIONS OF LSCS

INDICATION OF LSCS	N	PERCENTAGE
NON-PROGRESS OF LABOUR	06	12%
PULMONARY EDEMA	02	04%
MSL	03	06%
DOPPLER CHANGES	05	10%
PREVIOUS LSCS	08	16%
FETAL DISTRESS	06	12%
VAGINAL DELIVERY	20	40%
Total	**50**	**100%**

Table No. 4 is showing out of 30 LSCS cases 08 patients had indication of previous LSCS, 06 had NPOL which were induced by the inducing agents, 06 had fetal distress, 05 had doppler changes, 03 had MSL, 2 had pulmonary edema.
Fetal sex ratio of baby delivered from eclampsia patient in my study there were 30 male and 20 female children delivered from patients.

TABLE: 5 APGAR SCORE

APGAR SCORE	N	%
< 3	4	08.00%
3 – 7	21	42.00%
> 7	25	50.00%
Total	**50**	**100.00%**

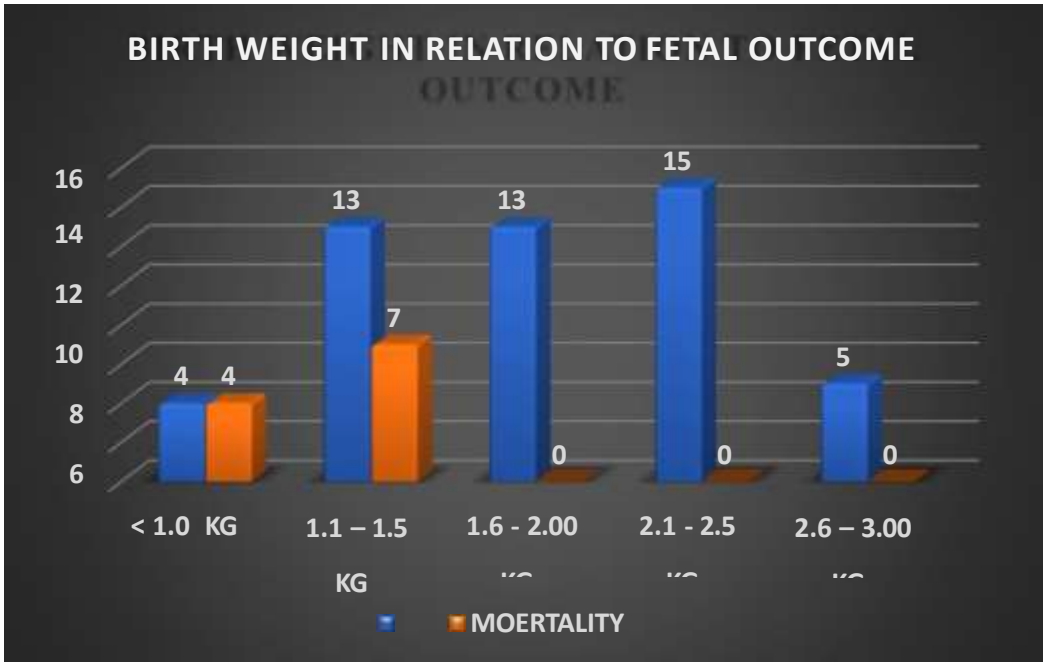
Table No. 5 is showing APGAR SCORE of the baby at 5 min after birth. In my study APGAR SCORE is more than 7 in around 25 babies at 5 min after birth.
Number of NICU admission of the new born babies 58% of baby required NICU admission.

TABLE: 6 CONVULSIONS TO DELIVERY INTERVAL IN RELATION TO MATERNAL COMPLICATION AND PERINATAL MORTALITY

C-D INTERVAL	NO.	PERINATAL MORTAITY	MATERNAL COMPLICATION
0-6	20(40%)	0	0
6-12	14(28%)	3(6%)	7(14%)
>12	16(32%)	8(16%)	8(16%)

In my present study convulsion to delivery interval is directly proportional to the maternal complication and perinatal mortality.

GRAPH: 3 BIRTH WEIGHT IN RELATION TO FETAL OUTCOME



Graph No. 3 is showing Perinatal mortality directly proportional to birthweight of the baby out of 11 mortality 63% was occurred in 1.1 to
1.5 kg birth weight and 36.36% occurred in <1 kg baby weight group.

TABLE: 7 FETAL COMPLICATIONS

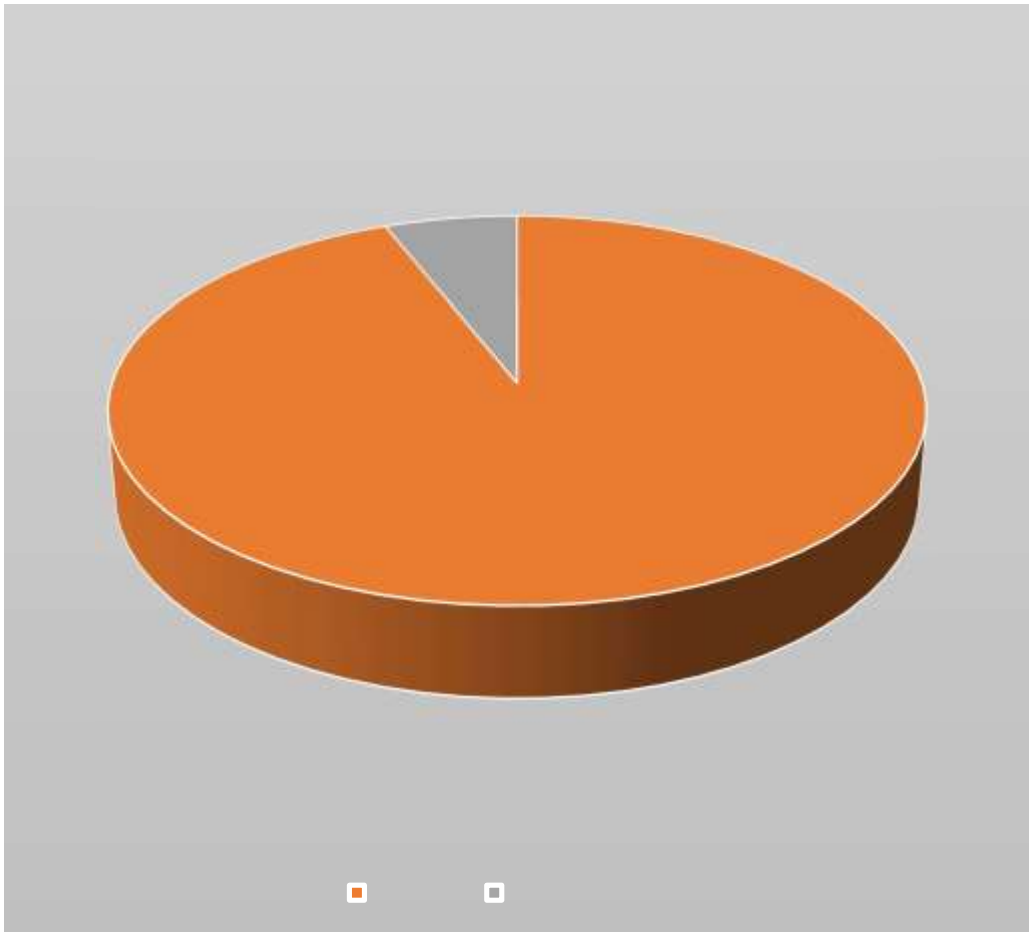
FETAL COMPLICATION	NO.	PERCENTAGE
RDS	8	16%
SEPSIS	3	06%
LBW	8	16%
HYPOCALCEMIA	5	10%
IUGR	3	06%
NO COMPLICATION	23	46%
TOTAL	**50**	**100%**

Table No. 7 IS showing out of 50 fetal birth 27 were developed complication from which 08 were RDS, 08 were LBW, 05 were hypocalcemia, 03 sepsis, 03 IUGR.

TABLE: 8 PERINATAL MORTALITIES

NICU ADMISSION	N
NEW BORN	50(100%)
NICU ADMISSION	29(58%)
MORTALITY	11(22%)

Table No. 8 IS showing total number of new born, number of NICU admission and number of perinatal mortalities among the total delivered babies. In my study total 11 perinatal mortality were there which is around 22%.
In my study around 73% perinatal mortality cause of death is respiratory distress syndrome and 27% due to sepsis.



GRAPH NO. 4 ANTI CONVULSANT THERAPY

Graph No. 4 is showing out of 50 patient's convulsions were controlled by Mgso^4 in 47 patients while 3 patients required Levetiracetam treatment due to not controlled by Mgso4. Out of 47 patients there were only 2 patient who has local abscess formation at the site of intramuscular injection in mgso4 treatment.
In my study most of the cases were from 20–25-year age group and mortality occur more in this age group only around 53.85% of total mortality. However, p value is 0.888 which is not significant for the association.
There were 47 patients from lower se class and 13 bad outcomes from that lower se class (100%). But the p value was 0.29 which was not significant.
From out of 50 patients 23 were booked and 27 were unbooked patients bad outcome were higher in booked patients around 53.85% which is not significant according to statistical analysis as p value is 0.624.
There was 76.92% bad outcome in 26-32 weeks gestational age group which is statistically significant as p value for that is 0.01. According to my study lower the gestational age outcome is poor.
In my study most of the patient had antepartum eclampsia and bad outcome is highest in antepartum eclampsia around 92.31%. But the p value for that is 0.371 which is statistically not significant.

TABLE 9 MATERNAL RISK FECTOR IN RELATION TO OUTCOME

MATERNAL RISK FECTOR	Bad outcome		Good outcome		Chi square test p value
	Frequency	Percentage	Frequency	Percentage	
No	9	69.23	32	86.49	0.164
Yes	4	30.77	5	13.51	

Total	**13**		**37**		

In my study around 9 patients had prior presence of risk factor who developed eclampsia bad outcome is more in patient group who did not have risk factor which is around 69.33%. However, p value is 0.164 which is not significant.

Out of 13 bad outcome 12 bad outcome was due to fetal complication which was highly significant as p value is 0.001.

Out of 13 bad outcome 10 bad outcome had no relation with the maternal complication. But p value for that is 0.423 which is not significant.

As the convulsion delivery interval is increasing the outcome is more towards bad there were 61.54% bad outcome in patients where interval was more than 12 hrs. P value was 0.001 which is highly significant.

TABLE:10 BABY WEIGHT IN RELATION TO OUTCOME

Baby Weight	Bad outcome		Good outcome		Chi square test p value
	Frequency	Percentage	Frequency	Percentage	
<1 kg	6	46.15	0	0.00	<0.0001
1.1-1.5 kg	6	46.15	5	13.51	
1.6-2 kg	0	0.00	13	35.14	
2.1-2.5 kg	1	7.70	14	37.84	
2.6-3kg	0	0.00	5	13.51	
Total	**13**		**37**		

There were 46.15% bad outcome in <1 kg baby weight and same bad prognosis 46.15% was in 1.1-1.5kg baby weight group so that less the baby weight more chances of bad prognosis is there. Which was highly significance as the p value was <0.0001.

Discussion-

- **MATERNAL AGE:**

Maximum patients are in age group of 20-25 years i.e. 58%. Which is most common reproductive age group in our region. Similar observation was made in a study conducted by Ratan Das in eastern India showing maximum patient in the age group of 19-24 years (2015) [11].

- **SOCIOECONOMIC STATUS:**

I my study around 94% patients were from lower socioeconomic class, in past similar study were done to know about risk factor of eclampsia done by LINDSAY M SILVA [12] in 2008 he also found that patient developed eclampsia were mostly from lower socioeconomic class.

This indicates that socioeconomic status, poor nutrition and inadequate antenatal care, have close relationship with eclampsia and increase perinatal and maternal mortality.

- **RISK FECTORS:**

According to my study there were around 4 risk factors were present in patients developed eclampsia which were previous PIH, family history of eclampsia, profound hypertension and obesity EMILY BARTSCH [13] found in her research that women with antiphospholipid antibody syndrome, previous history of PIH, family history of eclampsia, obesity, diabetes, has significantly higher chances of developing preeclampsia and eclampsia.

- **PARITY:**

76% of the patients in our study were primi as it is established that hypertensive disorder of pregnancy is more common in first pregnancy according to my study. J MOODLEY [14] conducted a study on hypertensive disorder in primigravida and found that most of the hypertensive pregnant women were primigravida. Significant increase in perinatal mortality in antepartum and intrapartum eclampsia is probably due to increase in duration of labor and birth asphyxia.

- **BLOOD PRESSURE:**

Bp >150/110 was associated with increased incidence of eclampsia. Similar observation was made in stroke and severe preeclampsia and eclampsia: a paradigm shift focusing on systolic blood pressure study by MARTIN, JAMES N JR. [15] in 2005.

- **ANTENATAL VISIT:**

As maximum population in our area are illiterate, there is not much awareness about regular antenatal visit therefore maximum patients were received late in pregnancy in third trimester similar observation were made by ELSMÉN, EMMA. [16] in 2006 that preeclampsia and eclampsia were higher in third trimester of pregnancy.

- **MATERNAL COMPLICATION:**

In the present study we have found a complication rate of 32% where in the maximum number of complicated patients suffered from PPH 10%, similar result was found in a retrospective cross-sectional study conducted by GHIMIRE, S· [17] that the complication rate was 18.9%. This is probably due to early onset DIC leading to postpartum hemorrhage.

- **MATERNAL MORTALIOTY:**

We observed mortality rate of 4% due to ARF and pulmonary edema.
GHIMIRE, S· [17] found maternal mortality rate of 5.36% in his study in 2016.

- **MODE OF DELIVERY:**

We have found a LSCS rate of 60% in our institute. This higher rate of LSCS can be explained as our's is a tertiary care center and we receive patient at the very end of the critical time to give trial for normal delivery. More over most patients received in our institute were having repeated convulsion in spite of full dose mgso4 or were having altered sensorium thus being a contraindication for vaginal delivery trail.
C D MASHILOANE [18] done study to see the outcome in case of severe preeclampsia in vaginal and emergency LSCS delivery and found that perinatal mortality were higher in the babies who were delivered by vaginal delivery.
In my study there were total 30 patients who were delivered from LSCS and 20 patients who delivered by vaginal delivery. Out of 30 LSCS majority indication of LSCS was previous LSCS, NPOL and fetal distress.

- **CONVULSION - DELIVERY INTERVAL:**

In the present series, convulsion delivery interval is directly proportional to maternal and perinatal mortality. However, increase in maternal mortality with increasing first fit to delivery interval was statistically not significant. Similar observation has been made by RAJESRI ET AL (2011) [19]
The perinatal mortality increases when the interval between the first fit and the delivery increases, due to prolonged exposure to intrapartum asphyxia.

- **PERINATAL COMPLICATION AND PERINATAL MORTALITY:**

We have observed the perinatal complication rate of 54% and a perinatal mortality of 22%. Whereas a

similar study done by WINIFRED LEE [20] in 2004 showed perinatal complication rate of 56% and perinatal mortality rate of 6.4%. This can be explained by having received complicated cases because of us being tertiary care center maximum patient recorded of respiratory distress and low birth weight.

- **MgSo4 TREATMENT COMPLICATION:**

A retrospective study conducted in 2014 showed no major side effect with mgso4 where as in present study there has been 2 patients who developed gluteal abscess. [21]

Conclusion-

Eclampsia still remains a major problem in developing countries. It is one of the important causes of maternal and perinatal morbidity and mortality due to lack of proper ANC, low socio-economic status and lack of education. As convulsion to delivery interval increases the prognosis was bad so that in view of good prognosis convulsion to delivery interval should be less.

Early attention and intensive management are essential for improving the maternal and fetal outcome in eclamptic cases. Unless the social and educational status of women are uplifted and obstetric care is brought to the doorstep, no miracle can be expected. A moderate reduction of death of mother and fetus in our institution was possible due to wider use of magnesium sulphate, timed delivery, proper implementation of emergency obstetric care facilities to mother with eclampsia.

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