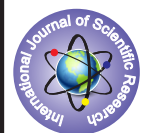


MRI CHANGES OF BRAIN IN CASES OF ECLAMPSIA



Gynaecology

KEYWORDS:

Hypertension,eclampsia,MRIchanges,TypicalPRES,atypicalPRES,preeclampsia

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ABSTRACT

Background In Kerala hypertensive disorders of pregnancy continue to be the second most important cause of maternal mortality (constitute 12% maternal deaths) 1.Among hypertensive cases eclampsia and preeclampsia continues to be major cause of death. Eclampsia is one of the causes for PRES (Posterior Reversible Encephalopathy Syndrome).Objective of present study is to understand MRI changes associated with eclampsia and to study maternal and perinatal outcome. **Methodology** Conducted as a prospective study from November 2013-December 2014 in Obstetrics and Gynecology department of government medical college Calicut, one among the famous tertiary centre of south India. Sample size was 50.All women admitted to this medical college eclampsia room with eclampsia and taken an MRI are selected. Data collected with questionnaire, clinical examination, biochemical test and MRI evaluation and analyzed using chi-square test. **Result** During the study period total number of deliveries were 18191 and total eclampsia cases patients were 107 and the incidence was 0.58%.Incidence of ante partum eclampsia was 54% and post-partum eclampsia 38%.Majority are primi(60%).56% showed MRI changes.30% typical and 26% atypical PRES,and 2 cases of infarct and hemorrhage. No correlation was found between MRI change and occurrence of maternal and perinatal out come and investigation abnormalities. **Conclusion** Irregular and improper antenatal care is the major cause for uncontrolled hypertension, severe preeclampsia and eclampsia.This along with delayed referrals is the main culprit behind increased perinatal and maternal mortality and morbidity associated with hypertensive disorders.MRI changes may not reflect severity of eclampsia

INTRODUCTION:

According to WHO 2014 hypertensive disorders are the third most common cause of maternal death all over the world. According to 2011 census hypertension follows hemorrhage in causing maternal death all over India. In Kerala according to CRMD 2006-2009 hypertensive disorders are second to hemorrhage in causing maternal death. Among hypertensive cases eclampsia and preeclampsia continues to be major cause of death.

Eclampsia can be defined as occurrence of seizure or coma in a patient with preeclampsia. The results of collaborative eclampsia trial¹suggest that magnesium sulphate is the drug of choice for routine anticonvulsant management of women with eclampsia than diazepam and phenytoin. Major breakthrough in the management of eclampsia came when Dr.J.A.Pritchard published his treatment protocols as Pritchard's IM regime .Zuspan and Sibai introduced continuous infusion of magnesium sulphate in which toxicity kept under control. MRI features of eclampsia basically are sub cortical and deep white matter edema affecting parietal and occipital lobes. These features also occur in PRES.

Eclampsia is considered as one of the causes of PRES.In MRI it will be seen as increased signal intensity in T2 images and reduced intensity in T1 images. This edema can also affect cerebellum, basal ganglia, watershed areas, and splenium of corpus callosum. There can also evidence of hemorrhage in HELLP syndrome. These features recover 6 weeks following delivery. PRES also occur in conditions like immunosuppressive therapy, Hypercalcemia, amyloid angiopathy, SLE, infection, septic shock.

Materials and methods

Study Design: Done as prospective cross sectional study during the period November 2013 to December 2014 in Obstetrics and Gynecology department of Government medical college Calicut. (One among the leading tertiary centers in Kerala).

Statistical Analysis: Statistical analysis were done using SPSS version 18.Data analyzed using chi-square test and p value <0.001 was considered significant.

Study Population: Around 50 eclampsia patients admitted with ante partum, intra partum and postpartum eclampsia to medical college

eclampsia room were selected.Among 107 eclampsia cases admitted during the study period 75 patients only took MRI(This is partly due to the fact that following delivery of antepartum eclampsia patients they will recover fully and MRI might not be done and some patient after cure will lose to follow up.MRI also not done in sick eclampsia patients).Those having seizure due to epilepsy, septicemia, meningitis, and hepatic coma, cerebral hemorrhage and other neurological diseases and those who do not have MRI were excluded

Data collected using questionnaire involving demographic data,details about eclampsia,mode of delivery, baby details, maternal outcome, examination and investigations and MRI details are collected.Regular antenatal checkups include monthly visit up to 28 weeks, two weekly till 36 weeks, and weekly thereafter.Maternal adverse outcomes include abruptio, occipital blindness, pulmonary oedema, HELLP syndrome, ARDS, renal failure, cerebral hemorrhage and maternal death.Fetal adverse outcome include NICU admissions and baby death.

RESULT

During our study period in Government medical college Calicut(November 2013-december2014) total number of deliveries were 18191.And total number of eclampsia cases were 107.Incidence of eclampsia was 0.58%.Incidence of antepartum eclampsia was 54% ,intra partum eclampsia 8%,and post partum eclampsia was 38%.In our study group there were no maternal deaths.As all the 3 cases were very sick and not taken an MRI.Majority are primi gravid (60%) coming in 20-25 years age group.92% are referred cases.Among them 10% had no antenatal checkups,28% had some antenatal check up 56% have regular antenatal checkup.44% had previous history of gestational hypertension,and 56% were showing MRI change.30% were showing features of typical PRES,26% have atypical PRES,2cases of infarct and hemorrhage. No correlation was found between MRI change and occurrence of maternal, perinatal adverse outcome and investigation abnormalities.

DISCUSSION

Out of 107 eclampsia cases 54% were antepartum eclampsia, 38% were postpartum eclampsia.Like in other studies in our institution also incidence of antepartum eclampsia remains high. Now a days incidence of post partum eclampsia is on rise is presumably related to proper access to prenatal care, early detection of pre eclampsia and prophylactic magnesium sulphate (Chames).This rise is not

reflected in our centre as this is a referral centre which receives references from tribal hospitals of Wayanad and Nilambur where many patients without antenatal care presents.

During the study period in our institution there were 3 cases of maternal death. The cause of death in first case was intra cranial hemorrhage, rest two cases occurred secondary to HELLP syndrome with acute kidney injury and multi organ dysfunction. (these maternal death cases not included in our study as they does not took MRI).

Out of 22 patients with ante partum eclampsia majority are above 32 weeks of gestation (77%). Among them 36% are in 37-40 weeks group, 40% in 32-36 weeks group and only 23% were in <32 weeks age group. According to Choudhary³ et al in Katmandu 72.34% cases of eclampsia occurred at term, According to Mattarand Sibai^{4,5} in 2000 found 91% eclampsia cases develop at or beyond 28 weeks. The remaining cases occur between 21-27 weeks (7.5%) or at 20 weeks of gestation or earlier (1.5%). In our study no cases occurred before 22 weeks.

Among 28 cases of post-partum eclampsia 22 cases occurred in first 2 days and only 6 cases occurred after 5th day and all the 5 cases were showing features of preeclampsia and MRI showed features of PRES. Late post partum eclampsia cases reported as late as post natal day 23. Late post-partum eclampsia is defined as eclampsia that occurs more than 48 hours after delivery and less than 4 weeks post-partum. Historically eclampsia was believed not to occur beyond 48 hours after delivery. But several recent reports confirmed its presence.

. Out of 50 eclampsia patients majority 46% in 20-25 years age group and 22% in <20 years age group. This was similar to Bharathy choudhary⁶ et al and Dr. Arti patel⁷. Eclampsia is a disease of young age group. In our study 60% are primi gravida, 40% are multi. The increased incidence in primi support genetic theory of preeclampsia. Majority are referred cases (92%). Only 8% are booked once. Only 56% had regular ante natal checkups (ANC). Remaining ones 8 of them lacks any ANC. Lack of antenatal care has been documented as a risk factor for eclampsia. But Douglas and Redmann⁸ in 1994 reported that eclampsia was seen despite ante natal care in 70% and within women's last visit to midwife. Eclampsia may not always be predictable or preventable. Among 50 eclampsia patients 44% had history of gestational hypertension before the onset of convulsions and that 28% was only taking drugs regularly. According to Sibai hypertension was absent in 16% cases of eclampsia.

In our study 74% showed atleast one premonitory symptom prior to the occurrence of convulsions. Pregnancies complicated by eclampsia are associated with increased risk of maternal death in developed countries, and maternal mortality as high as 14% in developing countries. This high maternal mortality was seen in those who had multiple seizures outside the hospital and those without prenatal care. In our study out of 50 patients 22% (N=11) developed HELLP syndrome. 10% developed renal failure and 4% developed pulmonary edema. One patient had status eclampticus one had cerebral hemorrhage. Main cause of development of these complications is delayed referrals. Out of 50 eclamptics 48% lack LFT or RFT changes indicating the fact that even before the development of full blown preeclampsia eclampsia can occur. 26% have LFT change alone, 10% have RFT changes and 8% have both.

Out of 22 cases of ante partum and intra partum eclampsia, 13 cases were induced, among them 7 cases delivered vaginally (Including 2 assisted vaginal deliveries), 6 cases gone for LSCS. Among patients not induced one patient went in to labour spontaneously and delivered, remaining 8 went for direct LSCS. Taken together total LSCS rate was 68.2%. This was similar to Deliwala⁹ et al in their study found cesarean rate of 53.9%. Alauddin¹³ et al in 2012 found a cesarean section rate of 71.05% while analyzing 608 cases of antepartum and intra partum eclampsia. According to him majority

of cesarean are done promptly to deliver those patients who were in early labour or not in labour. Both maternal and perinatal mortality rates were much lower with early cesarean section.

In our study 40% cesarean section was done for failed induction, 26% for unfavorable cervix and 20% previous cesarean. Perinatal mortality and morbidity remain high in eclamptic pregnancies. The perinatal mortality rate in our study is 27% (normally it ranges between 5.6% to 11.8%). High preterm delivery rate of 64% in our study explains increased perinatal mortality rates. This high rate also related to prematurity, abruption and severe fetal growth retardation.

Out of 50 patients under study 28 patients are showing MRI change. Lesions in MRI are hyper intense in T1 and hypo intense in T2 images with accentuation on FLAIR sequences. 30% were showing features of typical PRES (parieto occipital involvement). 11 cases (22%) atypical PRES and 2 cases infarction in putamen and 1 case showing parietal hemorrhage. In our study 57% have occipital lobe involvement and 61% have parietal lobe involvement and also temporal, frontal, cerebellum, basal ganglia and pons in various cases. Similar study in Turkey by Ozgur Demirtas¹⁰ shows 100% occipital lobe involvement 77.7% cases of parietal lobe involvement. However concurrent foci of infarction were present in 6 out of 27 eclamptic women reported by Zeeman¹¹ et al and in 3 out of 17 eclamptic women studied by Loureiro¹² et al.

The results of CT and MRI reveal presence of oedema and infarction with in the sub cortical white matter and adjacent gray matter mostly in parieto occipital lobes. In fact cerebral imaging is not necessary for diagnosis and management of women with eclampsia. Cerebral imaging is indicated for patients with focal neurological deficit or prolonged coma. Cerebral imaging also helpful in those with atypical presentation of eclampsia (before 20 weeks or 48 hours after delivery).

In this study all the 50 eclamptics received IM magnesium sulphate regime. Out of 22 antepartum eclampsia patients 18 had received Magnesium sulphate alone as anticonvulsant. In this group 2 developed recurrent seizures which were controlled with 2 gram bolus magnesium sulphate. 2 cases required both magnesium sulphate and phenytoin for seizure control. 2 cases required midazolam for seizure control. In that one case was status eclampticus.

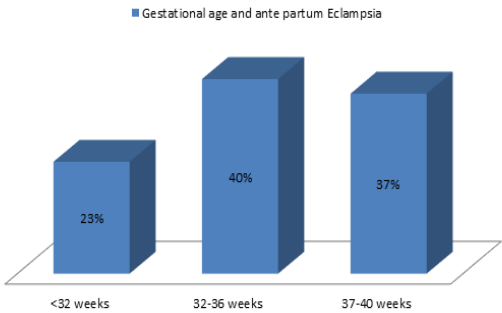
Most of late post-partum eclampsia are treated with phenytoin alone but 22 cases of early post-partum eclampsia received both phenytoin and magnesium sulphate. 10% eclamptic women have second convulsion after magnesium sulphate. The next step is blood pressure control. In our study 70% required nifedipine alone, 30% required both nifedipine and labetalol. And one patient required inj. NTG for BP control and in post-partum period most of them required nifedipine or amlodipine for BP control, one patient required telmisartan and atenolol in addition to amlodipine.

In our study there was no statistically significant correlation between MRI changes and maternal and perinatal outcome. There was no significant correlation between MRI changes and investigation abnormalities and premonitory symptoms indicating that MRI change may not always reflect severity of eclampsia. Study by Ozgur¹⁰ et al showed statistically significant relation between MRI change and investigation abnormalities and impending symptoms.

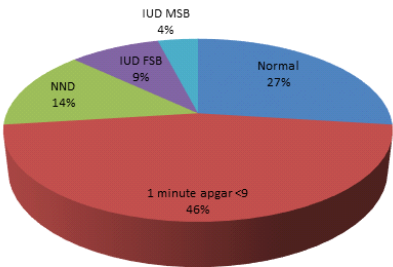
CONCLUSION

Irregular and improper antenatal care is the major cause for uncontrolled hypertension, severe preeclampsia and eclampsia. This along with delayed referrals is the main culprit behind increased perinatal and maternal mortality and morbidity associated with hypertensive disorders. MRI changes may not reflect severity of eclampsia

Gestational age and ante partum Eclampsia



PERINATAL OUT COME



Maternal complications

	cases	percentages
HELLP syndrome	11	22%
Renal failure	5	10%
Pulmonary oedema	2	4%
Maternal death	No cases	
Status eclampticus	1	2%

MRI changes

	cases	Percentages
YES	28	56%
NO	22	44%
Total	50	100%

MRI changes

	cases	Percentages
Occipital	16	57%
Parietal	17	61%
Frontal	10	36%
Cerebellum	3	11%
Temporal	7	25%
Basal ganglia	4	14%
Pons	3	10%
Corpus callosum	1	4%

Specific MRI changes

MRI changes	cases	Percentages
Typical PRES	15	30%
Atypical PRES	11	22%
Infarct	2	4%
Hemorrhage	1	2%

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