



## ANALYTICAL STUDY OF MRI BRAIN IN ANTEPARTUM AND POSTPARTUM ECLAMPSIA PATIENTS

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### ABSTRACT

**BACKGROUND:** Eclampsia is a life threatening event which affects all important organ systems. When it is diagnosed and intervened at the earlier, symptoms and radiological changes can be reversed. Besides clinical presentation, Neuroimaging is the only route to find out the CNS involvement. It provides a more accurate assessment of degree of CNS involvement.

**OBJECTIVE:** The objective of this study is to do MRI BRAIN for Antepartum and Postpartum eclampsia patients to identify the cause, to arrive at a proper diagnosis and to start the further management. To intervene as soon as the cause is made to avoid maternal morbidity and mortality.

**MATERIALS AND METHODS:** 50 eclampsia patients meeting the inclusion and exclusion criteria are selected, analysed the reports of MRI brain prospectively and different diagnosis is made based on the MRI findings results.

**RESULTS:** Out of 50 eclampsia patients in our study group, 40 patients have normal MRI finding. Out of 50, 5 patients are diagnosed as having posterior reversible encephalopathy syndrome. 2 patients have diffuse cerebral edema, 1 patient has right temporal infarct, 1 patient has combination of both acute infarct and subarachnoid hemorrhage. 1 patient has both diffuse cerebral edema and PRES.

**CONCLUSION:** Hereby we conclude from our study that MRI brain presents with different findings in eclampsia patients. Most common among them is PRES, for which strict control of blood pressure is the mainstay of management. Thus exact cause and diagnosis can be made through MRI imaging and patients can be started on appropriate management according to the diagnosis.

### KEYWORDS :

#### INTRODUCTION:

Hypertensive disorders are one of the most common complications of pregnancy. It is one of the major cause of maternal and perinatal mortality and morbidity worldwide. Among the Hypertensive disorders Preeclampsia and Eclampsia are life threatening, which affects all important organ systems.

Cerebrovascular involvement is the direct cause of death in 40% of the Gestational Hypertension patients. When it is diagnosed and intervened at the earlier, symptoms and radiological changes can be reversed.

Besides clinical presentation, Neuroimaging is the only route to find out the CNS involvement. It provides a more accurate assessment of degree of CNS involvement.

Neurovascular changes and complication occurring as a result of vascular pathology in cerebrovascular system is the reason behind Eclampsia. When it is identified by imaging studies and intervened, we can prevent the complication becoming irreversible.

To identify the prevalence of neurovascular complications and neurovascular changes in Eclampsia, a prospective analytical study was conducted. MRI Brain was done for 50 patients of Eclampsia and the findings were analysed.

#### AIM:

Analytical study of MRI BRAIN in Antepartum and Postpartum Eclampsia patients.

To do MRI BRAIN for all Antepartum and Postpartum Eclampsia patients and to identify the cause, to arrive at a proper diagnosis and further management.

To intervene as soon as the cause is made to avoid maternal morbidity and mortality.

To identify the prevalence of neurovascular complications in these cases.

#### MATERIALS AND METHODS:

This study was conducted in Govt. Thiruvavur Medical college, from January 2017 to August 2017.

**TYPE OF STUDY:** Prospective analytical study.

**SELECTION CRITERIA:** All antenatal patients who developed eclampsia either antenatally or postpartum for whom MRI was taken.

**INCLUSION CRITERIA:** 1. Antepartum eclampsia  
2. Postpartum eclampsia.

#### EXCLUSION CRITERIA:

1. Epilepsy
2. Cerebral tumours
3. Pre existing renal disorders.

#### METHOD OF STUDY:

MRI Brain is done for all antepartum and postpartum eclampsia patients after stabilising them. The MRI findings and data in all 50 patients were analysed and the neurovascular changes in all groups of patient were analysed.

#### STATISTICAL ANALYSIS:

The parameters of clinical significance that were studied are in the following tables:

1. Age in years.
2. MRI findings
3. Parity
4. Body mass index
5. Gestational age
6. Duration of hypertension since diagnosis
7. Proteinuria
8. Imminent symptoms.
9. Seizures
10. Past history
11. Level of consciousness
12. Systolic and Diastolic blood pressure

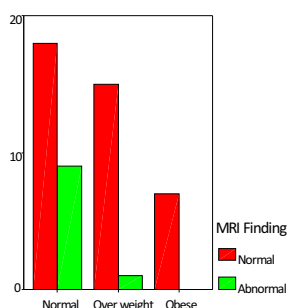
13. Mean arterial pressure
14. Fundus
15. Hemoglobin, platelet count and Liver function tests.
16. Renal function tests.
17. Magnesium sulphate therapy.
18. Anticonvulsant treatment.

#### RESULTS AND ANALYSIS:

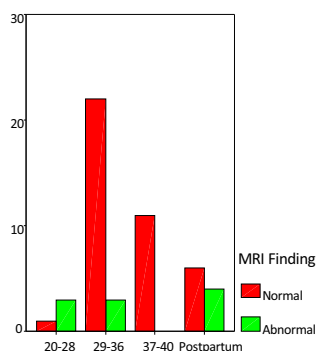
**TABLE: 1 COMPARISON OF PARAMETERS WITH MRI BRAIN FINDING:**

Parameters compared	P Value	Result
Age in years	0.543	Insignificant
Parity	0.139	Insignificant
<b>Body Mass Index (BMI)</b>	<b>0.036</b>	<b>Significant</b>
<b>Gestational age in weeks</b>	<b>0.003</b>	<b>Significant</b>
Duration since diagnosis	0.495	Insignificant
Proteinuria	0.678	Insignificant
Imminent symptoms	0.239	Insignificant
<b>Level of consciousness</b>	<b>0.001</b>	<b>Significant</b>
<b>SBP</b>	<b>0.015</b>	<b>Significant</b>
DBP	0.746	Insignificant
HB	0.402	Insignificant
Platelet	0.447	Insignificant
<b>LFT</b>	<b>0.043</b>	<b>Significant</b>
RFT	0.278	Insignificant
Fundus	0.279	Insignificant

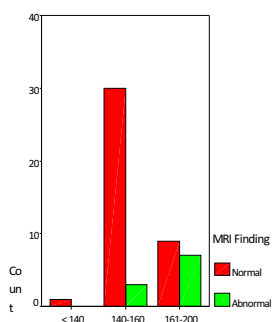
**SIGNIFICANT TABLES: BMI \* MRI FINDING CHART:1**



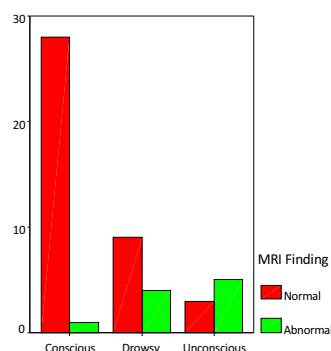
**GESTATIONAL AGE \* MRI FINDING CHART:2**



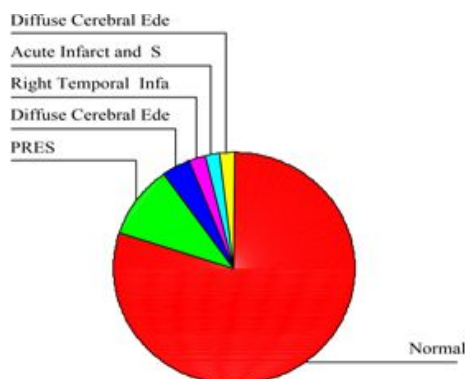
**SYSTOLIC BLOOD PRESSURE \* MRI FINDING CHART:3**



**LEVEL OF CONSCIOUSNESS\* MRI FINDING CHART:4**



**CHART: 5 MRI FINDING:**



#### DISCUSSION

In this study 50 eclamptic women were selected according to the Inclusion and exclusion criteria and Magnetic Resonance and Imaging was done. The reports were analysed and studied.

In our study, the most common age group was 21-25 yrs. 58% of the patients falls between 21-25 yrs of age. 18 % of the patients are >25 yrs of age. 24% are below 20yrs of age . 50% of the patients between the age group of 21-25 yrs have abnormal MRI finding. p value is 0.543 which is statistically not significant.

Majority of the patients are multigravida, which constitutes 60%. 80% of the patients having abnormal MRI findings are multigravida. 54% of the patients have normal BMI (19.8-26) . 14% are obese with BMI>29.4%. 90% of the patients with normal BMI have abnormal MRI finding. p value is 0.036 which is statistically significant.

Majority of the patients are antepartum at the time of presentation. 20% are postpartum. Majority of the eclampsia patients in our study are between 29-36 weeks of gestational age. p value is 0.003\*\* which is statistically significant.

Majority had hypertension diagnosed at the time of presentation that is 52.5% of the patients had hypertension diagnosed only at the time of presentation with eclampsia. 66.7% of the patients having abnormal MRI findings presented with eclampsia 1-4 weeks after the onset of hypertension. In our study, 47.5% of the patients with normal MRI findings and 40% of the patients with abnormal MRI findings have proteinuria of 1+. p value is 0.678 which is statistically not significant. Majority of the patients (90%) had imminent symptoms, 10% had no imminent symptoms, p value is 0.239 which is not significant.

In our study group, 58 % of the patients who are conscious had 10% of abnormal MRI findings. 26 % of the patients who are drowsy had 40% of abnormal MRI findings. Majority of the patients who are having abnormal MRI findings are unconscious (60%). P value is 0.001 which is statistically significant. Among the patients with normal MRI finding, 62.5% were unconscious, 37.5% were conscious.

Patients with systolic blood pressure ranging from 161-200mmHg, 70% have abnormal MRI finding, 22.5% have normal MRI finding. The patients with systolic blood pressure <160mmHg, had majority of normal MRI findings than abnormal. p value is 0.015, which is significant. Hence high systolic blood pressures have significant cerebral pathology. The patients with diastolic blood pressures >110mmHg have 50% abnormal MRI finding and 47.5% of abnormal finding. p value is 0.746 which is statistically not significant.

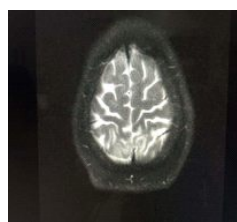
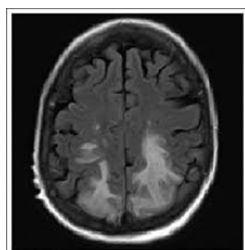
Majority of the patients were mildly anaemic that is Hb% between 9-11 gm%. These patients have 60 % of abnormal MRI findings. Among the patients with Hb 7-9 gm% only 10% had abnormal MRI findings. p value is 0.402, which is not significant.

In our study group, patients with more than 3 lakhs of platelet count have only 20 % of abnormal MRI findings. Those with less than 3 lakhs of platelet count had 80 % of abnormal MRI finding. p value is 0.447 which is not significant. Patients with altered liver function test had 100% of abnormal MRI finding. p value is 0.043 which is statistically significant.

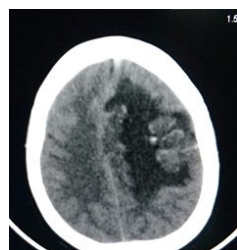
In our study group, Out of 50 Eclamptic patients, 40 patients had normal MRI finding. 5 patients are diagnosed as having Posterior Reversible Encephalopathy syndrome. 2 patients had diffuse cerebral edema, 1 patient had Right temporal infarct, 1 patient had combination of both Acute infarct and Subarachnoid Hemorrhage. 1 patient had both diffuse cerebral edema and PRES.

The most common finding is Posterior Reversible Encephalopathy Syndrome, next is the diffuse cerebral oedema. The most common area affected by PRES and hemorrhage is parieto occipital region as we discussed earlier, posterior circulation is more prone to acute hypertension as it lacks perivascular sympathetic nerves.

#### DIAGRAM: 1 POSTERIOR REVERSIBLE ENCEPHALOPATHY SYNDROME:



#### DIAGRAM: 2 SUBARACHNOID HEMORRHAGE:



#### CONCLUSION:

Hence from our study we conclude that 20% of the Eclampsia patients had pathological abnormalities detected through MRI scan of Brain. Patients with altered liver function tests, normal BMI, high Systolic blood pressure, Unconscious level are prone for developing Cerebral lesions.

Posterior Reversible Encephalopathy Syndrome was the most common pathological abnormality detected. The next common is the diffuse cerebral edema. Since majority of the patients had hypertension diagnosed only at the time of presentation, the need for effective screening of hypertension and its management is emphasized. Thus it is concluded that MRI brain should be included in the investigation protocol for Eclampsia if not for all, atleast for those patients with complications.

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