



## ORIGINAL RESEARCH PAPER

### MRI EVALUATION OF PATIENTS PRESENTING WITH SEIZURES

#### Radiodiagnosis

**KEY WORDS:** Mr Magnetic Resonance Imaging

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#### **ABSTRACT**

**AIMS:** MRI evaluation of patients presenting with Seizures

Materials and methods: A prospective study was conducted on 50 patients who presented with clinical impression of seizures at MGM hospital, Kamothe from september 2018 to October 2019 who were subjected to MRI scanning.

**RESULTS:** In our study, 50 patients who were clinically diagnosed of seizure disorder were undergone MRI examination of the brain. There was male predominance seen. In our study, 22 patients had normal MRI followed by infarct with gliosis ( n = 10, 20%) followed by neurocysticercosis ( n=4,8%), atrophy ( n= 3, 6%) then tuberculoma, venous thrombosis and developmental malformations each with n = 2 and 4 %, glioma, cavernoma, meningioma, cerebral abscess and sturge weber was seen in one patient each summing to 2%.

**CONCLUSION:** This study observed that MRI with appropriate imaging protocols adds sensitivity and specificity in evaluation of seizures.

#### **INTRODUCTION :**

Assessment of the patient presenting with seizure disorder is a common problem in clinical practice. MR imaging plays a pivotal role in the evaluation of patients with seizures. Accurate diagnosis of the cause of seizure is crucial for finding an effective treatment.

Seizure is a paroxysmal alteration in neurologic function resulting from abnormal excessive neuronal electrical activity. Epilepsy is a chronic condition characterized by recurrent seizures unprovoked by an acute systemic or neurologic insult. An epileptic seizure is a clinical manifestation of abnormal, excessive neuronal activity arising in the grey matter of the cerebral cortex. It is age dependant and higher in children and elderly persons than in young adults. Still a significant population continue to have seizures despite treatment.

In order to diagnose the etiology of the lesion, there are many neuro radiological investigations that can be utilized. These include x-ray of skull, pneumocephalography, CSF examination, carotid angiography, EEG, CT and MRI.

The revolutionary introduction of MRI for evaluation of seizures has been a great boon. both for the diagnosis of cerebral lesions as well as clinical management of patients with neurologic disorders. MR imaging has emerged as the more diagnostically valuable and most valuable tool for preoperative localization of epileptogenic focus because of its excellent soft tissue contrast, allowing for detailed depiction of anatomy, freedom from beam-hardening artifact in basal brain that occur with CT and capacity for multi planar imaging.

MR gives more precise localization and histological nature of lesions and subsequently, this is of immense help to both clinicians as well as neurosurgeons in their attempt to achieve a faster and more accurate method of discovering the nature of the pathologies.

The role of MR in epilepsy surgery in identifying the epileptogenic focus also lies in its ability to depict topographic relationships between epileptogenic lesion and the eloquent regions of brain. MR is especially useful for prognosticating postoperative seizure control. The following study has been undertaken to study the etiology and spectrum of MRI findings in patients with seizures.

#### **AIMS AND OBJECTIVES**

1. To identify structural abnormalities in the brain that may associated with the cause of seizures.
2. To study the spectrum of MRI findings in patients with seizures.
3. To study the etiological factors for seizures.

#### **METHODS AND MATERIALS :**

A prospective study was conducted on 50 patients who presented with clinical impression of seizures from September 2018 to october 2019. Patients were subjected to MRI scanning at MGM HOSPITAL, Kamothe , Navi Mumbai.

All patients who were referred to Department of Radio-Diagnosis and Imaging Sciences with clinical

symptoms and signs of seizures were studied. Study was performed with MRI machine

(TOSHIBA 1.5T).This study was carried out in 50 patients with clinical presentation of seizures by subjecting them to magnetic resonance imaging to evaluate the spectrum of findings, various etiologic factors for seizures, and the most common imaging abnormality. Depending on the radiological features a provisional diagnosis was made correlating the clinical features.

#### **INCLUSION CRITERIA**

All patients presented with seizures, irrespective of age and sex was included.

#### **EXCLUSION CRITERIA**

Patients with pacemakers, metallic implants, aneurysmal clips, Claustrophobia or anxiety disorders exacerbated by MRI,inability to provide consent.

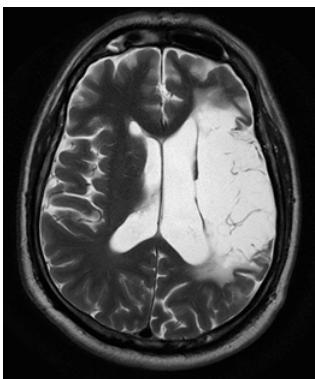
#### **AGE WISE AND GENDER WISE DISTRIBUTION OF PATIENTS PRESENTING WITH SEIZURES:**

Age in years	Male	Female	Total	Percentage
< 1	3	6	9	18
1-15	8	6	14	28
16-30	7	5	12	24
31-45	5	2	7	14
46-60	3	1	4	8
>60	4	0	4	8
<b>Total</b>	<b>30 (60%)</b>	<b>20 (40%)</b>	<b>50</b>	

## MRI FINDINGS OF PATIENTS PRESENTING WITH SEIZURES:

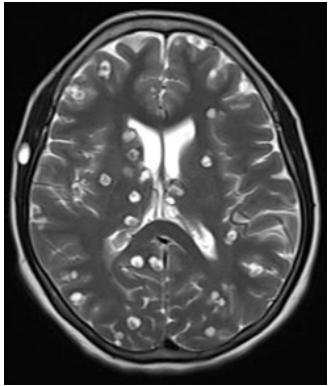
MR DIAGNOSIS	Findings	
	No.	%
Normal Study	22	44
Infarct with Gliosis	10	20
NCC	4	8
Atrophy	3	6
Tuberculoma	2	4
Venous Thrombosis	2	4
Developmental Malformations	2	4
Glioma	1	2
Cavernoma	1	2
Meningioma	1	2
Cerebral Abscess	1	2
Sturge Weber	1	2

### CASE 1: GLIOSIS WITH OLD MCA INFARCT.



A large area of encephalomalacia is present on the left side involving much of the the temporal lobe, posterior frontal and parietal lobes with surrounding gliosis, consistent with an old MCA territory infarct. There is associated ex-vacuo dilatation of the left lateral ventricle, and atrophy of the left cerebral peduncle consistent with Wallerian degeneration.

### CASE 2: NEUROCYSTICERCOSIS



Multiple well defined sub centimeter hyperintense lesions in both cerebral and cerebellar hemispheres, including the bilateral ganglio-thalamic region. Internal eccentric scolex noted. No evidence of mass effect.

### DISCUSSION :

Patients presenting with seizures can have wide range of MR imaging abnormalities depending upon the etiology. MRI can reliably identify and localize the intracranial abnormality so that further management can be planned accordingly.

The clinical history of each patient was recorded and all underwent routine biochemical investigations as per

proforma. MRI scan was carried out with 1.5 T PHILIPS MRI scanners. Patients presented with seizures of varying duration ranging from few days to few months. It was observed that most common neuroimaging abnormalities associated were cerebrovascular diseases, infections and developmental malformations.

Most common age group in our study was 1-15 years with male predominance.

The common finding noted was infarct with gliosis ( n= 10,20%) followed by neurocysticercosis (n=4,8%), atrophy (n=3,6%) then tuberculoma, venous thrombosis and developmental malformations.

### CONCLUSION :

MR imaging is a superior neuroimaging modality with no radiation exposure and should be the first investigation of choice in epileptic syndrome, cerebrovascular disease with seizure, developmental cortical malformations, and vascular malformations. Its ability in identifying subtle lesions, location, extent of the lesions and amount of findings are excellent. Thus, is helpful in early detection and thus deciding further course of management.

### REFERENCES:

1. Scott N. Atlas. Magnetic Resonance Imaging of the brain and spine. 4th edition,p.2-14, 307-339.
2. Harrison's principle of internal medicine. 17th edition,p.2498.
3. Goodridge DMG, Shorvon SD. Epileptic seizures in a population of 6000 demography, diagnosis and classification and role of the hospital services. Br Med J, 1983;287:641-647.
4. Sander JWAS, Hart YM, Johnson AL, Shorvon SD. National general practice study of epilepsy: newly diagnosed epileptic seizures in a general population. Lancet, 1990;336:1267-71.
5. McGahan JP, Dublin AB, Hill RP. The evaluation of seizure disorders by computed tomography. J Neurosurg., 1979;50:328-332.
6. Denier C, Masnou P, Mapouye Y, Souillard-Scemama R, Guedj T, Théaudin M, Fagniez O, Join-Lambert C, Lozeron P, Ducot B, Ducreux D, Adams D. Watershed infarcts are more prone than other cortical infarcts to cause early-onset seizures. Arch Neurol., 2010;67(10):1219-23.
7. TR Velasco, P A Zanello, CL Dalmagro, D Araújo, Jr, A C Santos, M M Bianchin, V Alexandre, Jr, R Walz, J A Assirati, C G Carlotti, Jr, O M Takayanagi, A C Sakamoto, J P Leite. Calcified cysticercotic lesions and intractable epilepsy: a cross sectional study of 512 patients. J Neurol Neurosurg Psychiatry, 2006; 77(4):485-488.
8. Tushar B Patil, Madhuri M Paithankar. Clinico-radiological profile and treatment outcomes in neurocysticercosis: A study of 40 patients. Ann Trop Med Public Health, 2010;3:58-63.
9. Rebecca S. N. Liu, Louis Lemieux, Gail S. Bell, Sanjay M. Sisodiya, Philippa A. Bartlett, Simon D. Shorvon, Josemar W. A. S. Sander, John S. Duncan. Cerebral Damage in Epilepsy: A Population-based Longitudinal Quantitative MRI Study. Epilepsia, 2005; 46(9): 1482–1494.
10. Ghayur Khan, Nasir Khan, Abdul Aziz. Detection of cerebral atrophy in type ii diabetes mellitus by magnetic resonance imaging of brain. J Ayub Med Coll Abbottabad, 2010;22(2).