

Study of EEG Abnormalities in Migraine

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ABSTRACT

Introduction: Migraine is common disease with recurrent headache usually associated with nausea, vomiting, sensitivity to light sound or smell. Migraine without aura is common than migraine with aura. Aim: To determine abnormalities in EEG in Migraine patient.

Material and Methods: 100 patient from out patient department of Neurology Thoothukudi Medical College Hospital from June 2016 – March 2017 were taken up for this study. Diagnosed as per IHS criteria. EEG performed in all patients. Patient with history of epilepsy, head injury, brain lesion, recurrent headache not compatible with HIS criteria were excluded from the study.

Result: 100 patients studied. 30 patients were migraine with aura. 70 patients migraine without aura. 60% had normal EEG in patient with aura and 75% normal EEG in migraine without aura. Abnormal EEG 40% in patient with migraine with aura. 24.28% had abnormal EEG in patient with migraine without aura. Slow waves most common abnormality followed by sharp and Spike wave.

Conclusion: EEG is not specific tool for diagnosis of migraine. Clinical criteria is best way for diagnosis of migraine

Keyword: Migraine, EEG, Headache

INTRODUCTION

Migraine is a common disease with recurrent attacks of a headache. The severity of a headache ranges from moderate to severe. Usually, migraine is associated with nausea, vomiting, and sensitivity to light, sound or smell.¹ Globally approximately 15% of people are affected by a migraine. After puberty migraine is more common in females. A family history of migraine is present in 90% of patient. Migraine with aura and migraine without aura are two most common types of Migraine.² Migraine without aura known as a common migraine is the most frequent type of a migraine accounting for 60-80% of migraine headache. EEG changes are noted in migraine patient. Generalized slowing of activity, spike, sharp waves paroxysmal theta activity are seen in migraine patient.³ Some studies support the concept of central neural hyper excitability as a pivotal physiological disturbance predisposing to a migraine. Migraine and epilepsy are both chronic disorders with recurrent neurological attacks accompanied by gastrointestinal, autonomic and psychological features.^{4,6} There is about 2.4 fold higher risk of a migraine in patient and their relatives who have epilepsy compared with relatives who do not have epilepsy. Study aimed to determine EEG changes in migraine,

MATERIAL AND METHODS

Migraine patient attending as out patient in department of neurology, Thoothukudi Medical College Hospital from June

2016 to March 2017 were taken up for the study. Total of 100 patient in age group of 10-40 years, diagnose according to international headache society were selected in this study. Patient with history of epilepsy, head injury, brain lesion, headache not compatible with IHS criteria were excluded from the study. Clinical history and examination, type of headache were evaluated. In all 100 patient EEG performed in out patient department. EEG lasted for 15 minutes and 3 minutes of hyper ventilation. Abnormal discharges including spike duration (20-70 ms), sharp wave 70-200 ms and slow waves more than 200 ms occurring singly or burst are distinguished from background activity.

RESULTS

Out of 100 Thoothukudi patient with migraine, patient with migraine with aura were 30 and migraine without aura 70 patients. With 30 patients migraine with aura male female ratio being 1:4. 70 patients with migraine without aura male female ratio is 1:2.8. (Table 1) Out of 100 patients 29 patients had EEG abnormalities. EEG findings between migraine with aura and migraine without aura. 18 patients of migraine with aura had normal EEG (60%). 53 patients with migraine without aura had normal EEG (75%). 12 patients with migraine with aura had abnormal EEG (40%). 17 patients migraine without aura had abnormal EEG (24.28%). (Table 2) EEG abnormality have been found in occipital, frontal and temporal areas. (Table 3) Migraine with aura had changes in occipital and frontal region. Migraine without aura had changes in occipital temporal and frontal region. Slow waves are most common abnormality followed by sharp waves changes. In patient with migraine with aura had slow waves in 7 patients sharp waves in 5 patients. In patient migraine without aura slow waves in 7 patient sharp waves in 6 patient and spike wave in 4 patients. (Table 4)

Type of migraine	Male	Female	Ratio	Total No.
Migraine with aura	6	24	1:4	30
Migraine without aura	18	52	1:2.8	70

Table-1: Sex distribution in migraine

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How to cite this article: R. Sownthariya, Heber Anandan. Study of EEG abnormalities in migraine. International Journal of Contemporary Medical Research 2017;4(8):1743-1744.

Type of migraine	Total No.	Normal EEG	Normal EEG %	Abnormal EEG	Abnormal EEG %
Migraine with aura	30	18	60%	12	40%
Migraine without aura	70	53	75.7%	17	24.28%

Table-2: Migraine types with eeg changes

Type of migraine	Total	Normal EEG	Occipital	Temporal	Frontal
Migraine with aura	30	18	8	0	4
Migraine without aura	70	53	7	6	4

Table-3: EEG changes in different areas of brain in types of migraine

Type of migraine	Total	Normal EEG	Slow waves	Sharp waves	Spike waves
Migraine with aura	30	18	7	5	0
Migraine without aura	70	53	7	6	4

Table-4: Different EEG changes in migraine type

DISCUSSION

EEG is not indicated in routine evaluation of patients with migraine. Most studies have done on EEG abnormalities in migraine. In our study migraine is more common in female than males. Migraine without aura is common than migraine with aura.⁷

Migraine and epilepsy are both common episodic neurological disorders, although migraine is more frequent. Migraine and epilepsy, both disorders share many clinical features and underlying pathophysiological mechanisms. The comorbidity of these two conditions is well known. Four types of relationship between headache and epileptic seizure are recognised- preictal headache, headache as the expression of an epileptic manifestation, postictal headache and interictal headache.^{8,9}

60% of patient with migraine with aura have normal EEG and 40% abnormal EEG. EEG abnormalities are found in occipital, frontal, temporal areas. Slow waves are most common than short or spike waves. EEG is considered as the mirror of brain activity. EEG is an essential tool in diagnosis of seizure disorder. EEG is not routinely suggested in the evaluation of a child with recurrent headaches as it is less likely to provide aetiology, improve diagnostic yield or distinguish migraine. But, EEG provides a vast potential for exploring the pathophysiology of migraine.¹⁰

Association between migraine and epilepsy has still not been sufficiently clarified. The connections seems to exist in some small things such as migraine like headache as an epileptic manifestations and probably in epilepsies with occipital spikes waves. Newer methods like EEG frequency analysis and topographic brain mapping are assuring tool in evaluation of extreme brain discharges in migraine patients.¹

CONCLUSION

Non-specific changes are noted in migraine patient. EEG is not useful in migraine. Clinical criteria are the best way for diagnosis of migraine.

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Source of Support: Nil; **Conflict of Interest:** None

Submitted: 23-07-2017; **Accepted:** 27-08-2017; **Published:** 08-09-2017