

ORIGINAL ARTICLE

Evaluation of MRI findings in patients with Migraine: A radiological study

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ABSTRACT:

Background: Headache is the most often reported neurological symptom. Migraine is a chronic and recurrent vascular headache, and is one of the most common diseases in the general population. Hence; the present study was undertaken for evaluating MRI findings in patients with Migraine. **Materials & methods:** A total of 15 patients with migraine were enrolled. Complete demographic details and clinical history of all the patients was obtained. Thorough clinical examination of all the patients was carried out and patients were prepared. MRI was done in all the patients and was findings were analyzed and interpreted by skilled and experienced radiologists. **Results:** Abnormal MRI findings were found to be present in 1 patient. In the present study, MRI of patient with abnormal findings revealed an area of diffusion restriction in left basal ganglia region which was hypointense on T1, T2 FLAIR and Hyperintense on T2 consistent with chronic infarct. **Conclusion:** Although rare, migraine patients do show abnormal findings on MRI. So, every migraine patients should be radiographically screened for assessing the underlying cause.

Key words: Magnetic resonance imaging, Migraine

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INTRODUCTION

Headache is the most often reported neurological symptom. Physicians are regularly confronted with the question of whether or not it is necessary to perform neuroimaging in order to confirm a distinct headache diagnosis.¹⁻³

Migraine is a chronic and recurrent vascular headache, and is one of the most common diseases in the general population. It is a complex brain disorder and its pathogenesis and mechanism has been widely investigated. Although migraine has been associated with various comorbidities, structural brain lesions also seem to be linked to the disease and are believed to be of vascular origins. Silent infarct lesions, also known as white matter hyperintensities (WMH), are referred to as obvious lesions with MRI infarction features and are not accompanied by clinical symptoms or other stroke-related signs. Several studies have investigated the risk factors associated with brain lesions in the MRI of migraine headache patients, although a consensus is yet to be reached on this matter.⁴⁻⁷ Hence; the present study was undertaken for evaluating MRI findings in patients with Migraine.

MATERIALS & METHODS

The present study was conducted in the department of radio-diagnosis of medical institute and it included

evaluating the MRI findings in patients with Migraine. Ethical approval was obtained from institutional ethical committee and written consent was obtained from all the patients after explaining in detail the entire research protocol. A total of 15 patients with migraine were enrolled. Complete demographic details and clinical history of all the patients was obtained. Thorough clinical examination of all the patients was carried out and patients were prepared. MRI was done in all the patients and was findings were analyzed and interpreted by skilled and experienced radiologists. All the results were summarized in Microsoft excel sheet and were analyzed by SPSS software. Chi-square test was used for assessment of level of significance.

RESULTS

In the present study, a total of 15 patients with migraine were analysed. Mean age of the patients of the present study was 42.6 years. There were 9 males and 6 females. Mean BMI of the patients of the present study was 24.8Kg/m². Overall, abnormal MRI findings were found to be present in 1 patient.

In the present study, MRI of patient with abnormal findings revealed an area of diffusion restriction in left basal ganglia region which was hypointense on T1, T2 FLAIR and Hyperintense on T2 consistent with chronic infarct.

Graph 1: Demographic details

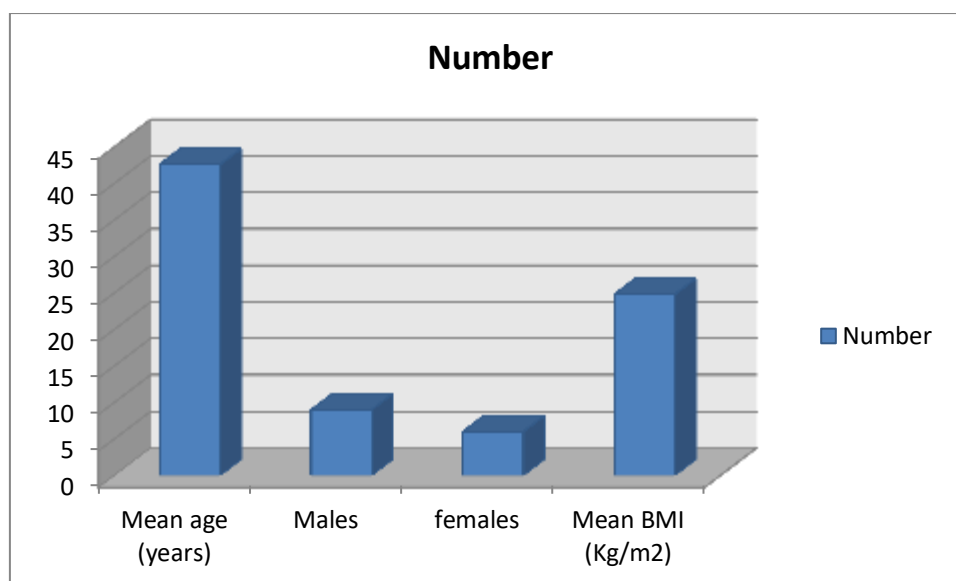


Table 1: Prevalence of abnormal MRI findings

MRI findings	Number of patients	Percentage	p- value
Normal	14	93.33	0.00
Abnormal	1	6.67	

Table 2: Abnormal MRI findings

Number of patients	T1	T2	T2 FLAIR	DWI	SWI
1	Hypointense area in Left basal ganglia region	Hyperintense area at Left basal ganglia region	Hypointense area in left basal ganglia region	Restricted diffusion in left basal ganglia region	-

DISCUSSION

Despite the strong relationship proposed between aura migraines and more intensified or deeply located lesions in white matter, the mechanism has not been well documented. Immediate hypoperfusion after a migraine attack has been suggested as an underlying mechanism. However, some researchers have observed delayed hyperemia following hypoperfusion during migraine episodes.⁶⁻⁹ Hence; the present study was undertaken for evaluating MRI findings in patients with Migraine.

In the present study, a total of 15 patients with migraine were analysed. Mean age of the patients of the present study was 42.6 years. There were 9 males and 6 females. Mean BMI of the patients of the present study was 24.8Kg/m². Overall, abnormal MRI findings were found to be present in 1 patient. Kruit MC et al assessed the MRI findings in migraine patients. Recently, data from a population-based cross-sectional MRI study were published, establishing migraine to be a true and independent risk factor for white matter lesions (in female migraine patients) and subclinical posterior circulation territory infarcts. The methodology and results of previous investigations of a relationship between migraine and clinical ischemic stroke, silent infarction and white matter lesions are reviewed, and

integrated in the results from the new population-based MRI study. Brain infarction occurs far more frequently than expected in migraine patients, most pronounced in migraine with aura (8 percent have subclinical cerebellar infarcts), although most infarcts remain clinically silent. Female migraine patients are at increased risk of deep white matter lesions, independent of the effects of cardiovascular risk factors. The influence of migraine severity (attack frequency) on the risk of both types of lesions suggests a causal relationship between migraine severity and lesion load.¹⁰

Usually, neuroimaging is not required in patients with episodic migraine who present with typical headache features according to the classification of the International Headache Society (IHS), and normal neurological examination. A meta-analysis of studies with migraine patients showed that in cases with normal neurological examination and a typical clinical presentation significant brain pathology was only detected in 0.18% of the patients. Therefore, neuroimaging is usually unnecessary in these patients. In some cases, patients might be frightened that their headache is caused by a brain tumour or another serious disorder. In these cases the strong patient wish for clarification might make it reasonable to perform cerebral imaging to eliminate these possible causes

and to appease the patient. One study showed that 60% of patients in a British regional headache clinic were afraid that they were suffering from a serious illness because of the headache. Two-thirds of them were still afraid after the appointment, and expressed the wish for neuroimaging.^{8,9}

In the present study, MRI of patient with abnormal findings revealed an area of diffusion restriction in left basal ganglia region which was hypointense on T1, T2 FLAIR and Hyperintense on T2 consistent with chronic infarct. Degirmenci B et al investigated the diffusion-weighted MRI changes, apparent diffusion coefficient (ADC) values, and conventional MRI findings in specific brain areas during migraine attacks in patients with and without aura. Included in the study were 22 patients (2 male, 20 female) aged between 17 and 49 years who were diagnosed as having migraine according to the diagnostic criteria of the International Headache Society. Also included in the study were 18 age- and sex-matched healthy volunteers. Hyperintense lesions were evaluated in conventional MR images. Heavily diffusion-weighted images, ADC maps, and segmented ADC maps generated for regional ADC (rADC) measurements, were also studied. ADC values from specific brain areas were used with appropriate region of interests (ROI). Migraine with aura was diagnosed in 13 patients and migraine without aura was diagnosed in 9 patients. A total of 23 hyperintense lesions within the periventricular white matter and deep white matter were detected in five patients (21.8%). All of these hyperintense lesions were seen in migraine patients with aura. In only one patient did a hyperintense lesion show an increased diffusion pattern on diffusion-weighted images and ADC maps. One hyperintense lesion was detected in the control group (5.5%). There was no significant difference in ADC values between the migraine and control groups. T2-weighted hyperintense lesions were significantly more frequent in migraine patients especially in those with aura than in the control group. No diffusion alterations in diffusion-weighted images were detected in the infra- and supratentorial brain areas during migraine attacks in patients with and without aura.¹¹

CONCLUSION

Although rare, migraine patients do show abnormal findings on MRI. So, every migraine patients should be radiographically screened for assessing the underlying cause.

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