

Assessment of Abnormal MRI Findings in Migraine Patients: An Observational Study

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ABSTRACT

Background: Headache is a common clinical feature in patients in the emergency room and in general neurology clinics. White matter abnormalities (WMAs) on magnetic resonance images (MRIs) can be seen with migraine, but they are also incidental findings in normal control populations. Hence; the present study was conducted for assessing the abnormal MRI findings in migraine patients.

Materials & Methods: A total of 15 patients diagnosed with migraine were enrolled in the present study. Relevant history, clinical examination and routine investigations were done. Patients underwent MRI investigations. All the findings were recorded in Microsoft excel sheet and were analysed by SPSS software.

Results: Migraine patient showed T2 and T2 FLAIR Hyperintensities in subcortical white matter in frontal region. Significant abnormal MRI findings were found to be present in 1 patient with migraine.

Conclusion: Neuroimaging of migraine patients in the general

population yields few but significant findings of clinical importance.


Key words: Migraine, MRI. White Matter Abnormalities.

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INTRODUCTION

Headache is a common clinical feature in patients in the emergency room and in general neurology clinics. For physicians not experienced in headache disorders it might be difficult sometimes to decide in which patient's neuroimaging is necessary to diagnose an underlying brain pathology and in which patients cerebral imaging is unnecessary. Headache is the most often reported neurological symptom. Many patients are frightened that they are suffering from a severe disease and therefore request further diagnostics.^{1,2} According to US Guidelines on Neuroimaging in Patients with Non-Acute Headache, Nonacute (or chronic) headache is defined as all headache syndromes lasting for at least four weeks. From an Indian perspective, few studies describe the epidemiology of headache disorders. Previously, these disorders have been investigated only within larger neuroepidemiological surveys that have neither focused on headache nor used internationally accepted criteria for headache diagnoses.^{3,4} Neuroimaging should be performed, however, on those suspected of an underlying disorder based on the presence of additional symptoms and signs that do not fit the clinical diagnosis of primary headache (e.g., atypical headache patterns, a history of seizures, and/or focal neurological symptoms or signs).⁵ Migraine is a very common primary headache disorder,

which affects more women than men and usually starts around the age of 20. Usually, neuroimaging is not required in patients with episodic migraine who present with typical headache features and normal neurological examination.⁶ Hence; the present study was conducted for assessing the abnormal MRI findings in migraine patients.

MATERIALS & METHODS

The present study was conducted in the Department of Radiology, G B Pant Institute of Postgraduate Medical Education & Research, New Delhi (India) and it included assessment of role of MRI scan in migraine patients. Ethical approval was obtained from the 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 diagnosed with migraine were enrolled in the present study. Relevant history, clinical examination and routine investigations were done. Patients underwent MRI investigations. All the findings were recorded in Microsoft excel sheet and were analysed by SPSS software. Mann-Whitney U test and chi-square test were used for assessment of level of significance. P- value of less than 0.05 was taken as significant.

RESULTS

A total of 15 migraine patients were analysed. Mean age of the patients of the present study was 42.8 years. Majority of the patients belonged to the age group of 31 to 50 years. 66.67

percent of the patients of the present study were females while the remaining were males. Significant abnormal MRI findings were found to be present in 1 patient with migraine.

Table 1: Age-wise distribution of patients

Age group	Number of patients	Percentage of patients
Less than 30	1	6.67
31 to 40	5	33.33
41 to 50	5	33.33
More than 50	4	26.67
Total	15	100

Table 2: Gender-wise distribution of patients

Gender	Number of patients	Percentage of patients
Males	5	33.33
Females	10	66.67
Total	15	100

Table 3: Migraine patients divided on the basis of MRI findings

Parameter	Presence of significant MRI findings		Absence of significant MRI findings	
	n	%	n	%
Migraine	1	6.67	14	93.33

Table 4: MRI finding in patient with Migraine

Parameter	T1	T2	T2 FLAIR	DWI	SWI
Migraine patient	-	Hyperintensities in bilateral peri-ventricular white matter and centrum semi-ovale	Hyperintensities in bilateral peri-ventricular white matter and centrum semi-ovale	-	-

DISCUSSION

Primary headache (i.e., migraine and tension headache) is the majority of headache patients presenting to a primary care practice, 76% of which are migraine. Migraine is the third most prevalent disorder worldwide and second most disabling, affecting more women than men. Approximately 0.1% of headaches are sinister (i.e., secondary headaches, which include neoplasm, aneurysm rupture, venous sinus thrombosis, meningitis, etc.).^{7,8}

In the present study, a total of 15 migraine patients were analysed. Mean age of the patients of the present study was 42.8 years. Majority of the patients belonged to the age group of 31 to 50 years. 66.67 percent of the patients of the present study were females while the remaining were males. Ferbert A investigated MRI pattern of a total of 45 patients suffering from classic migraine; 25 patients had been treated in department for classic migraine over the past 2 years (group A), and 20 other patients investigated between 1976 and 1984 were re-examined for this study (group B). Thirty-two age- and roughly sex-matched healthy volunteers underwent magnetic resonance imaging and served as controls (group C). There was a trend for patients with classic migraine to have more subcortical patchy lesions on T2-weighted

magnetic resonance imaging. In a comparison of present control subjects and patients with a history of >20 attacks of classic migraine taken from groups A and B, this difference in number of lesions was significant ($P=0.02$). The results suggested that patchy lesions in patients with classic migraine should be interpreted with particular caution before diagnosing a demyelinating disease since the lesions could be ischemic in origin.⁹

In the present study, migraine patient showed T2 and T2 FLAIR Hyperintensities in subcortical white matter in frontal region. Significant abnormal MRI findings were found to be present in 1 patient with migraine. Lewis DW assessed the utility of neuroimaging in the evaluation of children presenting with two of the most common forms of headache, migraine and chronic daily headache, and to determine the utility and pathological yield of neuroimaging in specific headache syndromes in children whose neurological examinations are normal. Twelve (11.2%) patients with migraine received an MRI, 2 (16.7%) of which were considered abnormal. Eight (26.7%) of the patients with chronic daily headache had an MRI, 2 (25.0%) of which were abnormal.

One of the abnormalities was a Chiari I malformation, and the other was an occult vascular malformation. The yield of neuroimaging in children with uncomplicated migraine and normal neurological examination was 3.7%. The yield in children with chronic daily headache and normal neurological examination was higher at 16.6%.¹⁰ Swartz RH undertook a meta-analysis of published case-control studies for addressing the relationship between migraine and magnetic resonance imaging White matter abnormalities (WMAs) WMAs. Seven studies were identified. Data from studies reporting the incidence of magnetic resonance imaging WMAs in those with migraine and appropriate control populations were used to calculate odds ratios for WMAs in migraine for each study. The summary odds ratio shows that those with migraine are at increased risk for WMAs (odds ratio, 3.9 [95% confidence interval, 2.26-6.72]). The risk does not differ between studies that included subjects with comorbidities and those that did not. This meta-analysis demonstrated that subjects with migraine are at higher risk of having WMAs on magnetic resonance images than those without migraine.¹¹

CONCLUSION

Neuroimaging of migraine patients in the general population yields few but significant findings of clinical importance.

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