

# Assessment of Magnetic Resonance Imaging Findings in Patients with Migraine

Aswin Padmanaban 

Assistant Professor, PK Das Institute of Medical Sciences, Vaniamkulam, Palakkad, India.

## Abstract

**Background:** To assess magnetic resonance imaging findings in patients with migraine. **Subjects and Methods:** Fifty-eight patients of migraine headache in age range of 20-60 years of either gender were enrolled. Magnetic resonance imaging (MRI) was performed with 1.5 Tesla machine following all standardized aseptic parameters. Type of migraine was recorded. Different MRI findings in these patients were recorded. **Results:** There were 24 male and 34 female. Out of 58 patients, age group 20-40 years comprised of 38 (65.5%) and 40-60 years had 20 (34.5%) patients. Type of migraine was common migraine in 32 (55.1%), basilar migraine in 17 (29.3%) and complicated migraine in 9 (15.5%) patients. Common MRI findings was single 2-mm, right-sided, periventricular white matter lesion in 18%, single 4-mm, oval, periventricular, left frontal white matter lesion in 50% and multiple 2- to 4-mm, round, bilateral, subcortical white matter lesions in 32% patients. **Conclusion:** Migraine headache is a common neurological disorder which has great impact in life. Common migraine, basilar migraine and complicated migraine were common types seen in our patients.

**Keywords:** Basilar Migraine, Complicated Migraine, Magnetic Resonance Imaging, White Matter Abnormalities.

**Corresponding Author:** Aswin Padmanaban, Assistant Professor, PK Das Institute of Medical Sciences, Vaniamkulam, Palakkad, India.  
E-mail: [aswinpaps@gmail.com](mailto:aswinpaps@gmail.com)

Received: 30 September 2020

Revised: 17 November 2020

Accepted: 28 November 2020

Published: 31 December 2020

## Introduction

Headache is common disorder among all age groups. Migraine headaches are leading cause of disability in large population. It is manifested as various severities of headaches linked with dysfunction of autonomous nervous system. Among both genders, women are mostly affected. It affects approximately 15% of humans.<sup>[1]</sup>

It is evident that white matter abnormalities (WMAs) are peculiar findings in patients with migraine headache as detected with magnetic resonance images (MRI), but this finding may also be seen in healthy subjects.<sup>[2]</sup> The occurrence of silent infarcts are also common in these patients. It has been found that subjects who are at risk for cerebrovascular accidents (CVA) show white matter abnormalities.<sup>[3]</sup>

The aetiology and the pathophysiology of migraine headache are not clearly defined; however, it is regarded to be vascular in nature. It is usually interpreted as ischemic lesions. Research demonstrates atherosclerosis, advanced age, increased attacks and comorbidities such as diabetes, hypertension etc. risk factors for white matter abnormalities

in these patients.<sup>[4]</sup>

In contrast to this, few studies depict increased occurrence of WMAs in migrainous patients as compared with those without migraine.<sup>[5]</sup> The classical symptoms of headache are sufficient to make diagnosis of migraine based on the classification of the International Headache Society (HIS).<sup>[6]</sup> Before the advent of MRI, CT scan was widely used as neuroimaging modality. Common CT findings in these patients were atrophy, ischemic changes, and cerebral edema.<sup>[7,8]</sup> Considering this, we selected present study to assess magnetic resonance imaging findings in patients with migraine.

## Subjects and Methods

A sum total of fifty-eight patients of migraine headache in age range of 20-60 years of either gender were enrolled for this prospective, observational study. The ethical clearance certificate was obtained from Ethical and Review board of institute. All patients were made aware of the study and once they agreed to give their written consent, they were selected. Inclusion criteria were those who gave their consent and cases confirmed with MRI. Exclusion criteria was those not giving

consent and patients beyond specified age group.

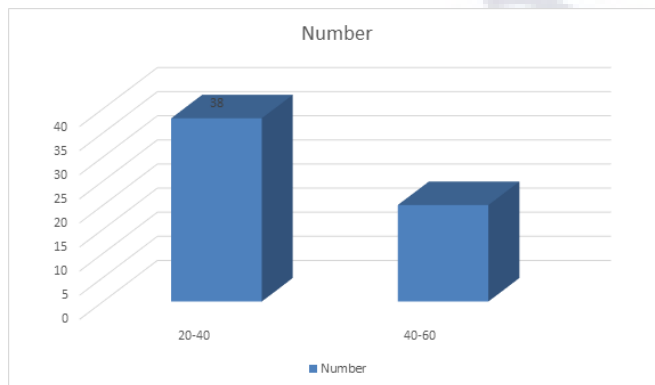
Patient demographic data was entered in case history proforma. A thorough physical and clinical examination was carried out. Magnetic resonance imaging (MRI) was performed with 1.5 Tesla machine following all standardized aseptic parameters. Findings such as positive family history, aura, scintillating scotoma etc. were recorded. Type of migraine was recorded. Different MRI findings in these patients were recorded. Statistical analysis in these patients was performed using Kruskal Wallis test. The data was entered in MS excel sheet and level of significance level was set below 0.05.

## Results

**Table 1: Age wise distribution**

Age group (Years)	Number (%)	P value
20-40	38 (65.5%)	<0.05
40-60	20 (34.5%)	

Out of 58 patients, age group 20-40 years comprised of 38 (65.5%) and 40-60 years had 20 (34.5%) patients. The difference was significant ( $P < 0.05$ ) [Table 1, Figure 1].



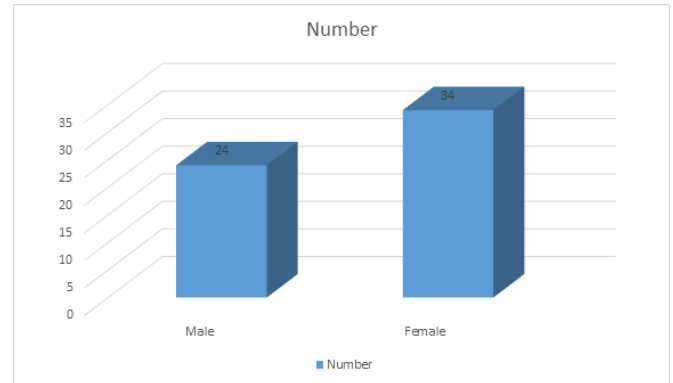
**Figure 1: Age wise distribution**

**Table 2: Gender wise distribution**

Gender	Number	P value
Male	24	<0.05
Female	34	

There were 24 male and 34 female [Table 2, Figure 2].

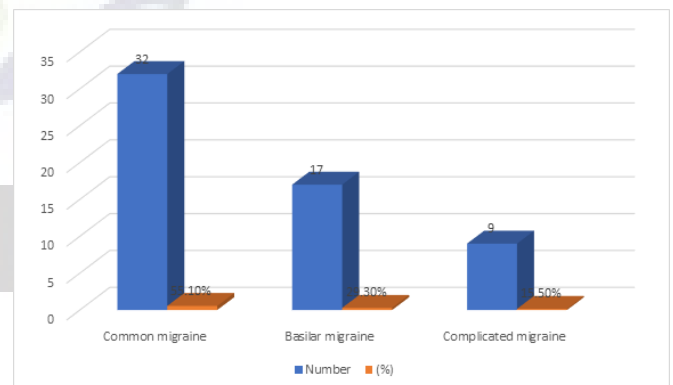
Type of migraine was common migraine in 32 (55.1%), basilar migraine in 17 (29.3%) and complicated migraine in 9 (15.5%) patients. The difference was significant ( $P < 0.05$ ) [Table 3, Figure 3].



**Figure 2: ?**

**Table 3: Type of migraine**

Type	Number (%)	P value
Common migraine	32 (55.1%)	< 0.05
Basilar migraine	17 (29.3%)	
Complicated migraine	9 (15.5%)	



**Figure 3: Type of migraine**

**Table 4: Recording of MRI findings**

MRI findings	%	P value
Single 2-mm, right-sided, periventricular white matter lesion	18%	<0.05
Single 4-mm, oval, periventricular, left frontal white matter lesion	50%	
Multiple 2- to 4-mm, round, bilateral, subcortical white matter lesions	32%	

[Table 3] shows that common MRI findings was single 2-mm, right-sided, periventricular white matter lesion in 18%, single 4-mm, oval, periventricular, left frontal white matter lesion in 50% and multiple 2- to 4-mm, round, bilateral, subcortical white matter lesions in 32% patients. A significant difference was found ( $P < 0.05$ ) [Table 4, Figure 4].

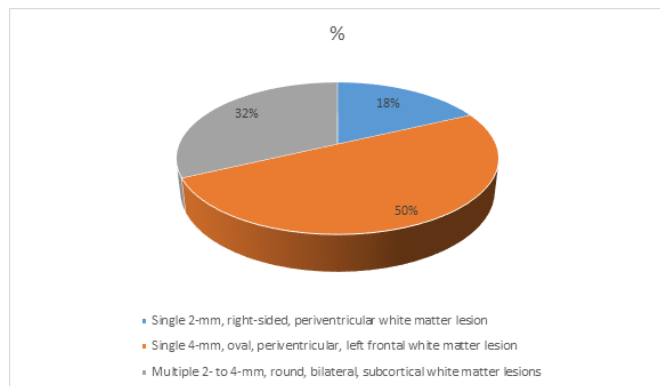


Figure 4: Recording of MRI findings

## Discussion

Migraine is common neurological disorder usually manifest as aura.<sup>[9]</sup> The correlation between migraine headache and MRI detected intracranial lesion favours the concept that repeated attacks of migraine may be connected to cerebral ischemia.<sup>[10]</sup> It is also evident that migraine is connected with impaired life quality and disabilities.<sup>[11]</sup> The work and daily activities of patients are greatly affected. Analgesics are required to treat patients with migraine. Complete bed rest is advisable which further hampers work efficiency.<sup>[12,13]</sup> The present study to assess magnetic resonance imaging findings in patients with migraine.

We observed that out of 58 patients, age group 20-40 years comprised of 38 (65.5%) and 40-60 years had 20 (34.5%) patients. Alkhaffaf et al,<sup>[14]</sup> included 100 adult patients with mean age of 35.04 years diagnosed with migraine based on Headache Classification Committee of the International Headache Society (IHS) criteria. Maximum cases were observed in age ranged 29-38 years. MRI findings showed that 36% patients had WMHI whereas 64% were having normal MRI findings. The average headache was 5.69 attacks /month and global assessment of migraine severity showed severity rate of 3.6. Migraine disability assessment questionnaire average disability was 14.29. It was shown in the study that frequency, severity, disability and duration were higher in the positive group, compared to the negative groups ( $P < 0.05$ ).

In our study there were 24 male and 34 female. Osbon et al,<sup>[15]</sup> conducted a study on forty- one patients with migraine

(24 male, 17 female). 31 patients had common migraine, 4 had classical migraine, 4 had complicated migraine. Results showed that cigarette smoking habit was seen in 5 patients, 1 was hypertensive, 1 had unilateral sensorineural hearing loss, 1 had somatic hemiatrophy. MRI findings revealed that foci of high signal intensity were seen on long TR scans in 5 patients. 3 abnormal MR scans showed had only one or two foci of abnormality. The remaining two abnormal scans each had multiple bilateral white matter lesions. No cortical lesions were seen in any of the patients. A left frontal lobe venous angioma was seen in one patient; mild to moderate degrees of chronic sinus changes manifested by mucosal thickening and retention cysts were seen in 15 patients.

We observed that type of migraine was common migraine in 32 (55.1%), basilar migraine in 17 (29.3%) and complicated migraine in 9 (15.5%) patients. It was found that common MRI findings was single 2-mm, right-sided, periventricular white matter lesion in 18%, single 4-mm, oval, periventricular, left frontal white matter lesion in 50% and multiple 2- to 4-mm, round, bilateral, subcortical white matter lesions in 32% patients. Swartz et al in their study found that patients with migraine are at increasing risk of WMHI as seen on MRI.<sup>[16]</sup> Toghae et al observed that there were 4 folds increase in the incidence of WMHI lesions in patients with migraine headache.<sup>[17]</sup>

## Conclusion

Migraine headache is a common neurological disorder which has great impact in life. Common migraine, basilar migraine and complicated migraine were common types seen in our patients.

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**How to cite this article:** Padmanaban A. Assessment of Magnetic Resonance Imaging Findings in Patients with Migraine. *Asian J. Med. Radiol. Res*. 2020;8(2):131-134.

DOI: [dx.doi.org/10.47009/ajmrr.2020.8.2.21](https://doi.org/10.47009/ajmrr.2020.8.2.21)

**Source of Support:** Nil, **Conflict of Interest:** None declared.

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