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## ORIGINAL RESEARCH

### Analysis of magnetic resonance imaging findings in patients with secondary (chronic) headache

Navdeep Grover<sup>1</sup>, Shivani Aggarwal<sup>2</sup>

<sup>1,2</sup>Assistant Professor, Dept of Radiodiagnosis, Mulayam Singh Yadav Singh Medical College, U.P., India

#### ABSTRACT

**Background:** A secondary headache may develop de novo or in patients with a history of primary headaches, and a thorough history and neurological exam often helps to suspect a secondary etiology. Hence; the present study was planned for assessing the prevalence of abnormal MRI findings in patients with Migraine, Cluster and tension type headache patients. **Materials & methods:** A total of 24 cases of chronic secondary headache were enrolled in the present study. Secondary headache patients included patients with space occupying lesions (n=4), patients with withdrawal headache (n=4), patients with cerebral ischemia (n=4), patients with psychiatric headache (n=4), patients with infection (n=4) and patients with seizure (n=4). A self-framed questionnaire was made for obtaining complete knowledge about the demographic and clinical details of all the patients. MRI was carried out in all the 24 patients and MRI findings were assessed. **Results:** Out of 24 patients with secondary headache, abnormal findings were found to be present in 54.17 percent of the patients. **Conclusion:** MRI of brain is effective identification of underlying pathology in patients with secondary (chronic) headache However; further studies are recommended.

**Key words:** Chronic, Secondary headache.

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**Corresponding author:** Dr. Shivani Aggarwal, Assistant Professor, Dept of Radiodiagnosis, Mulayam Singh Yadav Singh Medical College, U.P., India

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#### INTRODUCTION

A secondary headache may develop de novo or in patients with a history of primary headaches, and a thorough history and neurological exam often helps to suspect a secondary etiology. The causes of secondary headaches include tumors, vascular etiologies, structural brain disorders, infection, inflammation, and alterations of cerebrospinal fluid pressure dynamics.<sup>1,2</sup> While primary headaches disorders are far more frequent than secondary headache disorders, there is an urge to carry out neuroimaging studies out of fear of missing uncommon secondary causes and often to relieve patient anxiety.

Chronic headaches are defined as headaches present for at least 3 months and lasting greater than or equal to 15 days per month.<sup>3,4</sup> The International Classification of Headache Disorders states that for most secondary headaches the characteristics of the headache are poorly described in the literature and for those headache disorders where it is well described there are few diagnostically important features.<sup>5-8</sup>

Hence; the present study was planned for assessing the prevalence of abnormal MRI findings in patients with Migraine, Cluster and tension type headache patients.

#### MATERIALS & METHODS

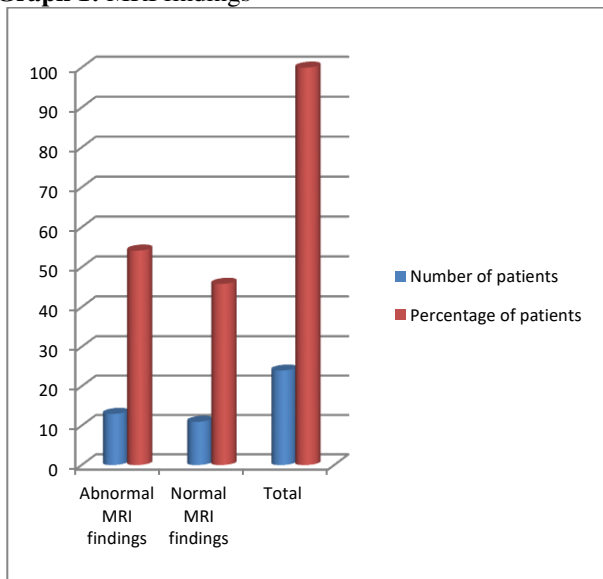
With the aim of assessing the MRI findings in patients with secondary (chronic) headache, the present study was undertaken. Ethical approval was obtained before the starting of the study and written consent was obtained from all the patients after explaining in detail the entire research protocol. A total of 24 cases of chronic secondary headache were enrolled in the present study. Secondary headache patients included patients with space occupying lesions (n=4), patients with withdrawal headache (n=4), patients with cerebral ischemia (n=4), patients with psychiatric headache (n=4), patients with infection (n=4) and patients with seizure (n=4). A self-framed questionnaire was made for obtaining complete knowledge about the demographic and clinical details of all the patients. MRI was carried out in all the 24 patients and MRI findings were assessed. Assessment of all the

results was done by statistical software followed by analysis with chi-square test.

**RESULTS**

Out of 24 patients with secondary headache, abnormal findings were found to be present in 54.17 percent of the patients. Among patients with space occupying lesions, patients with withdrawal headache, patients with cerebral ischemia, patients with psychiatric headache, patients with infection and patients with seizure, abnormal findings were found to be present in 4 patients, 0 patient, 4 patients, 0 patient, 4 patients and 1 patient respectively.

**Graph 1: MRI findings**



**DISCUSSION**

Headaches disorders are generally classified as either primary or secondary with further sub-classifications into specific headache types. Primary headaches are those not caused by a disease or medical condition and include i) tension-type headache, ii) migraine, iii) cluster headache and, iv) other primary headaches, such as hemicrania continua and new daily persistent headache. Secondary headaches include those headaches caused by an underlying medical condition.<sup>6-8</sup>

In the present study, out of 24 patients with secondary headache, abnormal findings were found to be present in 54.17 percent of the patients. Sempere et al., reported the detection rate for significant intracranial abnormalities using CT and MRI. In a cohort of 1876 persons with a non acute headache defined as any type of headache experienced for at least 4 weeks, the rate of detection was 19/1432 (1.3%) using CT and 4/444 (0.9%) using MRI. Of 119 normal CT scans 2 (1.7%) had significant intracranial abnormality on MRI. The 2 cases were a small meningioma and an acoustic neurinoma.<sup>9</sup> Systemic bacterial and viral infections may also cause headache, typically of moderate to severe intensity and diffuse/holocranial in location, which develops in temporal relation to the onset of the infection and improves in parallel with its resolution. It should also be

noted that a systemic infection can worsen underlying migraine headache in predisposed patients.<sup>10</sup> Longitudinal studies report a cumulative incidence of 71% after moderate or severe traumatic brain injury and 91% after mild traumatic brain injury at 1 year following the event. However, the precise incidence and prevalence of posttraumatic headache is unclear, as many patients do not seek care following mild injury. Risk factors for the development of posttraumatic headache include a prior history of headache, milder degree of head trauma, and age younger than 60 years.<sup>11</sup>

In the present study, among patients with space occupying lesions, patients with withdrawal headache, patients with cerebral ischemia, patients with psychiatric headache, patients with infection and patients with seizure, abnormal findings were found to be present in 4 patients, 0 patient, 4 patients, 0 patient, 4 patients and 1 patient respectively. A brain MRI will help to rule out structural lesions and secondary causes. The addition of gadolinium is useful to evaluate for demyelinating plaques and leptomeningeal disease. Further imaging techniques such as three-dimensional fast imaging employing steady-state acquisition (3-D-FIESTA) and constructive interference in steady state (CISS) magnetic resonance imaging, diffusion tensor imaging (DTI), fast inflow with steady-state procession (FISP), and constructive interference in steady state (CISS) have been used to identify neurovascular compression and evaluation of the trigeminal nerve root anatomy for pre-surgical planning.<sup>10, 11</sup> Rai GS et al evaluated the findings of computed tomography (CT) and Magnetic Resonance Imaging (MRI) among patients presented with the chief complaint of headache. This retrospective observational study was carried out in 500 selected patients, who underwent CT or MRI scan of head in Peoples College of Medical Sciences and Research centre. All 500 patients were divided in to two groups A and B based on presence or absence of red flag signs and CWC signs. Group A consists of 48 patients having one or more red flag or CWC signs and group B consists of 452 patients those don't have any above signs. 29 cases (60.4%) out of total 48 cases of group A is suffering from chronic headache as compared to 97 cases (21.5%) out of total 452 patients of group B is having positive findings (p-value<0.05). Out of 500 patients, only 29 cases (5.8%) revealed some form of brain parenchymal pathology whereas other associated findings were seen in 97 cases e.g. sinusitis in 58 (11.6%), bone related pathology in 26 (5.2%) and chronic suppurative otitis media (CSOM) in 13 (2.6%) patients. CT/MRI in patients without red flag or CWC sign yields very low percentage of clinically significant positive findings in neuroimaging.<sup>12</sup>

**CONCLUSION**

Under the light of above obtained results, the author concluded that MRI of brain is effective identification of underlying pathology in patients with secondary (chronic) headache. However; further studies are recommended.

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