



## Effects of migraine in cognition

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### Background

Migraine is among the 3 most burdensome neurological disorders in the US in terms of absolute number of disability-adjusted life years (DALYs) from 1990 to 2017, behind just stroke and Alzheimer disease and other dementias. Migraine is characterized as a type of unilateral primary headache marked by a series of neurological and vascular alterations, which can occur episodically or chronically and course with intermittent attacks of intense or moderate headache. Moreover, cognitive dysfunctions are interim and disabling components of this disorder and may be related to the brain processes underlying the pathophysiology.

### Objective

Examine the effects of migraine in the cognitive functions, such as language function, visuospatial function, attention, executive function and memory, of adults between 19 and 45 years old.

### Method

This study consists in a narrative review of articles published in the last 5 years on MEDLINE database searched through PubMed. The articles were found using the following MESHs: Migraine and Cognition.

### Results

We utilized 3 studies that approached cognitive impairment in migraine attacks and interictally. In a clinical trial, 144 patients with chronic migraine (CM) and 44 age-matched patients with episodic migraine (EM) (a maximum of 4 headache days per month) were compared by cognitive assessments. In the Montreal Cognitive Assessment (MoCA), CM patients demonstrated the most striking impairment in memory/delayed recall (65.3%), attention (46.5%), abstraction (30.6%), and language (27.1%). In one meta-analysis, it was shown a lower general cognitive function in migraine group, compared to no migraine group with a random effects model (standard mean difference (SMD)=-0.40, 95% CI=-0.66 to -0.15, I<sup>2</sup>=92.8%, p<0.001). Additionally, an analysis in language function showed a lower language function in migraine group, compared to no migraine group with a random effects model (SMD=-0.14, 95% CI=-0.27 to -0.00, I<sup>2</sup>=65.1%, p=0.001). Also, no significant difference in executive function between migraine group and no migraine group was found (SMD=-0.05, 95% CI=-0.16 to 0.05, I<sup>2</sup>=54.7%, p<0.001). In another meta-analysis, migraineurs demonstrated significantly poorer performance on tasks of delayed memory, as compared to healthy controls, with a small-to-moderate effect size (g=-0.44, 95% CI=-0.80 to -0.07, I<sup>2</sup>=74.24%, p=0.02). Regarding complex attention, the results were (g = -0.42, 95% CI=-0.58 to -0.26, I<sup>2</sup> = 25.14%, p<0.01) and no significant difference in visuospatial function was shown (SMD=-0.23, 95% CI=-0.53 to 0.08, I<sup>2</sup> = 56.1%, p = 0.077).

### Conclusion

We identified that cognitive impairment is indeed one of the possible manifestation in migraine. This disorder affects especially in the delayed memory, language functions and complex attention of patients. Regarding executive and visuospatial functions, there was no significant difference between migraine and no migraine groups. However, the high heterogeneity of some results require a cautious interpretation and demand more studies. Thus, migraine attack-related cognitive dysfunction is clinically relevant and contributes to disability, so it should be perceived as a therapeutic target.

**Keywords:** Cognition, Cognitive functions, Migraine, Impairment.