

Introduction

Patients with chronic migraine frequently report cognitive complaints that impair social situations and daily life activities.

Besides this, they may report increased fatigue, psychiatric disorders and other somatic conditions.

Functional imaging research has reported that chronic migraine may be associated with metabolic and structural abnormalities.

Berryman C, Pain 2013
Schwedt TJ, Lancet Neurol 2009



Introduction

Several studies have focused in the association between migraine and cognitive function but results from these studies are controversial.

Some cross-sectional studies found no differences between patients and controls, while others found evidence of worse cognitive performance among migraineurs.

Tests used to assess cognitive function were not standardized and most of the studies did not evaluate chronic migraine.

Hooker WD, Arch Neurol. 1986
Zeitlin C. Br J Clin Psychol. 1984;

Mckendrick AM, Cephalalgia 2006
Leijdekkers ML, Headache 1990
Gaist D. Neurology. 2005
Jelicic M, Headache. 2000;
Pearson AJ, Cephalalgia. 2006



Introduction

A multi-center prospective cohort study aiming to investigate cardiovascular disease, also evaluated participants for migraine with and without aura for cognitive function.

Migraine without aura was associated with worse cognitive performance, but chronic migraine was not specifically evaluated.

Pellegrino Baena C, et al. Cephalalgia 2017



Introduction

Rist et al presented results about the association between migraine and cognitive decline over time, in elderly people.

Participants reported a lifetime history of migraine, in the past, and they were assessed for cognitive function (mean age of 69 years).

They found no evidence that migraine was associated with faster cognitive decline over time.

Rist PM, et al. Cephalalgia 2011



Introduction

A study found a worse performance in patients with chronic migraine using cognitive tests when compared with healthy controls.

However, this study did not analyze the influence of factors such as psychiatric disorders, sleep disorders or the use of medications.

Santos-Lasaosa S et al. Rev Neurol, 2013



Objectives

The objective of the present study was to assess the presence of cognitive deficits in patients with chronic migraine, taking topiramate or not, compared to a control group.

An additional objective was to assess the main factors that trigger cognitive disorders in the population with chronic migraine (depressive disorder, anxiety disorder and non-repairing sleep).



Methods

This study was conducted by interviewing patients treated at a Neurology Clinic in Brazil.

Inclusion criteria: Patients of both sexes, aged 18 to 60 years, with chronic migraine with or without aura, according to the criteria of the International Headache Society.

Exclusion criteria: Presence of dementia, organic brain dysfunction (including neurological diseases that influence cognitive function and cranial trauma) or illiteracy.

Methods

We used a control group of patients without migraine, matched to the study subjects for gender, age and schooling.

During the interview, we assessed the frequency and intensity of the headache attacks, doses of medication used (including topiramate) and associated comorbidities (depressive disorder, anxiety disorder - by DSM-V criteria and Beck Inventory for depression and anxiety - and non-repairing sleep- "Do you have any kind of sleep problems such as insomnia, unrefreshed sleep or sleep apnea?").

Methods

Neuropsychological evaluation included:

- Montreal Cognitive Assessment Test (MoCA)
- Verbal Fluency Test
- Stroop Test
- Color Trails Test
- Wechsler Adult Intelligence Scale: Digit Spam, Vocabulary and Matrix Reasoning
- Rey Auditory Verbal Learning Test
- Beck Depression and Anxiety Inventories

Data were analyzed using the SPSS software, version 18.

Results

A total of 73 patients were approached and only 60 were included

>30 of them with chronic migraine (CM)

>30 used as control group (CG)

Table 1: Demographic data of patients with chronic migraine (CM) and control patients (CG)

	CM / n=30	CG / n=30	P
Mean age	33.7 (Sd 11.2)	33.7 (Sd 9.7)	0.79
Gender	29 (96.7%) women	29 (96.7%) women	1.0
Marital status	15 (50%) married	11 (36.7%) married	0.37
High school educational level	10 (33.3%)	10 (33.3%)	0.64

Table 2: Characteristics of headache in patients with chronic migraine

Characteristics	Frequency
Pulsatile	19 (63.3 %)
Nausea	26 (86.6 %)
Photophobia	27 (90%)
Phonophobia	24 (80%)
Aura	1 (3.3 %)
Visual pain scale	8.5 (Sd 1.9)
Time of pain in years	14.7 (Sd 11.3)
Use of topiramate	15 (50%)

Table 3: Mean scores in neuropsychological tests for patients with chronic migraine (CM) and controls (CG), *Mann Whitney test*

Test	CM n = 30	CG n = 30	P **
MoCA*	24.4	26.7	0.00
Verbal Fluency	13.7	19.1	0.00
Clock Test	2.2	2.7	0.00
Stroop Test (1)***	14.3	11.6	0.00
Stroop Test (2)***	17.9	14.3	0.01
Stroop Test (3)***	24.5	18.8	0.00
Matrix Reasoning	17.8	18.9	0.01
Digit Spam	13.0	15.8	0.00

Results

After statistical adjustment by linear regression, considering the use of topiramate, depressive disorder, anxiety disorder and non-repairing sleep, migraine continued to be the only relevant factor regarding the poorer performance in the MoCA, Verbal Fluency, Clock Test and Stroop Tests.

The group taking topiramate also showed a poorer performance in the Digit Spam and in the Vocabulary Tests.

Table 4: Linear regression model in which the MoCA test was the dependent variable, controlled by the independent variables chronic migraine, use of topiramate, major depressive disorder, generalized anxiety disorder, and non-repairing sleep.

Model	Unstandardized coefficients B	Std error	P *	95% confidence interval for B
Chronic migraine	2.47	0.76	0.00	0.92
Use of topiramate	-0.45	0.86	0.60	-2.20
Depressive Disorder	-1.18	0.91	0.20	-3.02
Generalized Anxiety Disorder	0.22	0.85	0.79	-1.47
Non-repairing sleep	-0.37	0.79	0.63	-1.98

Conclusion

Clinical implication of these findings:

- We propose an active search of cognitive deficits in patients with chronic migraine, including a brief neuropsychological evaluation of these patients.
- We can optimize the treatment of the patients with cognitive deficits.
- There are strategies of cognitive interventions to improve these deficits, as "cognitive training", improving quality of life.

Teanor CJ, et al. Cochrane Database 2016



Conclusion

Unanswered questions about this subject:

- Future studies should also investigate cognitive deficits in patients with episodic migraine and the exact moment when they will appear, in a longitudinal evaluation.


