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Executive and attentional functions in patients with migraine

Mauro Jurno[1], Valeska Magierek[1,2], Letícia Silva Gomes de Carvalho[1], Camila Gualberto Bernardes de Assis[1]

[1]Faculdade de Medicina de Barbacena, Barbacena, Minas Gerais, Brazil.
[2]Centro AMA de Desenvolvimento, Barbacena, Minas Gerais, Brazil.

Introduction
The Executive Functions (EF) allow the individual to direct behaviors to the goal, evaluate his/her efficiency and appropriateness, and eliminate ineffective strategies by other efficient and functional ones to solve short, medium, and long-term problems. To this end, attention is fundamental to learning and problem solving.

Objective
To relate executive and attentional functions with the presence or absence of migraine.

Methods
A cross-sectional study on the presence of attentional and EF alterations in migrant patients, with a target sample of 42 subjects, 30 migrants and 13 non-migrants. Subjects above eighteen (18) years of age, recruited consecutively by convenience at the *Centro Acadêmico Multiprofissional Dr. Agostinho Paolucci of the Faculdade de Medicina de Barbacena - CAM FAME, Faculdade de Medicina and Centro AMA de Desenvolvimento*, were included in the study, regardless of sex, after completion of the free and informed consent form - FICF. Subjects with migraine were in accordance with the criteria of the International Classification of Headaches (ICHD-3). All subjects diagnosed with migraine and undergoing neuropsychological evaluation were included. The Psychological Attention Assessment Battery (APB) was used for the attention test and the Five Digits Test was used for the EF test. The APB measures the attentional performance in 3 (three) distinct types of attention, related to 1) the ability to maintain the focus of attention on a given stimulus for a prolonged time; 2) the ability to distribute attention resources for the simultaneous execution of multiple tasks; 3) the ability to alternate attention resources among different stimuli. The Five Digits Test verifies the speed of reasoning and response, its accuracy and assertiveness, and can also be used as a measure of attentional processes and their accuracy. The tests estimated executive and attentional functioning as a function of the presence of headache. The analyses set the type I error at 0.05.

Results
Of the final sample, 13 (30.9%) individuals reported no headache, 29 (69%) met criteria for migraine. The Concentrated Attention Test showed difference between the groups ($p = 0.033$), obtaining difference between the means in non-migraineurs and migraineurs, respectively, 99% and 87.8% when evaluating the raw score for concentrated attention. To obtain the comparison of the means the statistical tests T and Wilcoxon with two samples were used. The Alternate Attention Test showed a difference between groups of $p = 0.11$. The General Attention Test showed a difference between groups of $p = 0, 033$. All of them point to reduced attentional potential in migrants when compared to non-migrants. The 5 Digit Test showed lowering in the migraineurs group when compared to the non-migraineurs (inhibition = 0, 3092; flexibility = 0, 2323). Multivariate analysis identified a relationship between EF, Attention, and migraine ($p<0.05$). This can be observed in three isolated profiles: percentile by age group, has $p= 0.129$; percentile by education, has $p= 0.061$; by raw value, has $p= 0.335$.

Conclusion
Individuals with migraine have lower EF and attentional skills when compared to non-migraineurs. The time spent, both in the EF and Attentional Skills, tends to be higher in the migraine group, which can help in understanding the cognitive processes under the action of headache, leading to rehabilitation strategies that favor the skills studied, as well as the individual's quality of life and productivity.

Keywords: Headache, Migraine, Executive functions, Attention.