



Assessing the influence of migraine on stroke ischemic penumbra

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Introduction

There is controversy as to whether migraine affects the behavior of ischemic penumbra during the acute phase of an ischemic stroke, thereby accelerating the formation of cerebral infarction.

Objectives

To assess whether migraine modifies the existence and volume of the divergence between the areas of diffusion and perfusion in the stroke (the penumbra).

Methods

This was a prospective cohort study carried out in a hospital in the city of Recife, Pernambuco, Brazil. We included consecutively hospitalized patients with ischemic stroke within 72 hours of symptom onset. A diagnosis of ischemic stroke was made by the presence of a diffusion restriction pattern on the MRI within a compatible clinical context. Patients were assessed by a neurologist who conducted an interview using a semi-structured questionnaire containing questions regarding sociodemographic data, the presence and characteristics of headaches in their lives, the presence and characteristics of headaches related to ischemic stroke and the related clinical condition to ischemic stroke. The headaches presented were classified according to the diagnostic criteria of the third edition of the International Classification of Headache Disorders. The National Institute of Health Stroke Scale and the modified Rankin scale were used. Patients underwent MRI of the brain with diffusion and with perfusion.

Results

A total of 221 patients were included, 59.3% of whom were male, and a mean age of 68.2 ± 13.8 years. Ischemic penumbra analysis was performed in 118 patients. There was no association between migraine and the absence of ischemic penumbra (OR: 1.22; CI95%: 0.52 – 2.87; $p=0.649$; chi-square test). There was no difference in the volume of ischemic penumbra between those with and without migraine. There was no difference in stroke volume between those with and without migraine (1.0; 0.38 – 7.9 cm³ vs 1.82; 0.34 – 9.45 cm³; $p=0.995$; Kruskal-Wallis test).

Conclusion

Migraine is not associated with a higher frequency of an absence of ischemic penumbra or with the volume of ischemic penumbra.

Keywords: Cerebrovascular disease, Ischemic stroke, Migraine, Ischemic penumbra, PWI–DWI mismatch.