

NEUROPHYSIOLOGICAL EVALUATION IN HEMIPLEGIC MIGRAINE PATIENTS: A STUDY WITH REPETITIVE TRANSCRANIAL MAGNETIC STIMULATION AND SOUND INDUCED FLASH ILLUSIONS

A. Torrente, P. Alonge, V. Gulino, A. Palermo, L. Pilati, C. Camarda, V. Di Stefano, G. Cosentino, F. Brighina

Department of Biomedicine, Neurosciences and advanced Diagnostics, University of Palermo, Italy

Background. Migraineurs show increased cortical excitability and dysfunction in intracortical inhibitory patterns. Furthermore, an increased visual excitability leads for to reduction of illusory phenomena when concurrently presenting visual and auditory stimuli (sound-induced flash illusions – SIFI). Hemiplegic migraine (HM) is a rare subtype of migraine with aura with striking motor manifestations. The aim of the study is to assess the neurophysiological correlates of HM patients.

Methods. Patients affected by HM and episodic migraine without aura (MwoA) were included, as well as healthy subjects (HS) of same age and sex. Repetitive transcranial magnetic stimulation (rTMS) was performed using trains of 10 stimuli at 120% of resting motor threshold at 5Hz. Motor evoked potentials (MEPs) were considered as % related to the first MEP. The response trends were distinguished into facilitatory, inhibitory, or flat. Regarding SIFI, fission illusions were evaluated delivering one flash (1F) with 2–4 beeps (B), while fusion illusions were induced delivering 2–4F with 1B.

Results. 9HM (4F), 13MwoA (11F) and 11HS (7F) were included. MEPs 2-10 were significantly higher in HS compared to HM and MwoA, with the facilitatory as the most represented trend (63.6%), while the most frequent in migraineurs was the inhibitory one (HM 88.9%, MwoA 84.6%, χ^2 comparing the three groups p=0.004). HM and MwoA perceived less fission illusions (1F3B HM 1.62±0.43, MwoA 1.45±0.35, HS 1.95±0.25, p=0.003; 1F4B HM 1.64±0.47, MwoA 1.52±0.37, HS 2.16±0.26, p=0.001), while only HM perceived significantly fewer fusion illusions than HS (3F1B HM 2.84±0.44, MwoA 2.52±0.53, HS 2.35±0.23, p=0.028).

Conclusions. HM showed rTMS results comparable to MwoA, confirming that a baseline increased cortical excitability may lead to protective inhibitory responses where HS show facilitatory ones. Both MwoA and HM showed a lesser extent of SIFI, but only HM presented a reduction in fusion illusions compared to HS, demonstrating how such population may show increased visual excitability that goes beyond MwoA patients.