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Repetitive transcranial magnetic stimulation in refractory spasticity treatment in patients with multiple sclerosis

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Background: Multiple sclerosis (MS) is the second largest cause of moderate/severe disabilities in individuals between 20-50 years of age. Spasticity is a common disabling symptom with a prevalence of up to 84%, mainly affecting the flexor muscles (upper extremities) and extensor muscles (lower extremities), which consequently produced alterations in walking pattern and functional capacity.

Repetitive Transcranial Magnetic Stimulation (rTMS) is a non-invasive technique that selectively modulates the cortical excitability. The Theta Burst intermittent (TBi) is a short-lived and very safe stimulation protocol that can be an alternative to the conventional treatments.

Objective: To analyze the therapeutic effect of rTMS-TBi on spasticity of the lower limbs by clinical and neurophysiological parameters in MS patients refractory to other treatments.

Methods: Patients with relapsing-remitting MS were randomized to experimental/control groups.

Treatment protocol: 10 sessions of rTMS-TBi applied to the contralateral motor cortex (to the most spastic lower limb) for 2 weeks.

The spasticity degree was assessed using: direct clinical parameters (Modified Ashworth Scale, MAS), indirect clinical parameters [Penn Spasm Frequency Scale (PSFS), plantar support, time to traverse 8 metres (Hauser index)], and neurophysiological parameters (H/M ratio). Data were analysed at pre-treatment, at the end of 10 rTMS sessions, and 2 weeks later.

Results: 11 patients were studied (6 experimental and 5 placebo). One of the 6 patients on treatment improved the plantar support (from plantigrade to heel-toe at the end of the treatment and 2 weeks later). MAS improved in 5 patients and remained at 2 weeks (in 2 of the 3 muscles analyzed). PSFS improved in 3 patients but the effect was not sustained. The walking speed improved in all 6 patients at the end of the treatment and 2 weeks later.

In the control group, 1 patient improved the plantar support, 2 the walking speed and 3 the PSFS. All of them showed improvement in at least one muscle group.

The H/M ratio showed an improvement in the experimental group which remained stable until the last day, however, this was not observed in the control group.

Conclusions: There were no significant differences according to clinical parameters between experimental and control groups. The neurophysiological analysis (ratio H/M) revealed a sustained improvement in the experimental group.

Due to the small sample size, the study results were not conclusive.

Nothing to disclose