Rhythmic transcranial magnetic stimulation (RTMS) as a tool for reducing overall levels of fatigue in patients with multiple sclerosis

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BACKGROUND

Multiple sclerosis is a complex, heterogeneous demyelinating disease associated with increasing disability. According to WHO, among neurological diseases, multiple sclerosis is one of the main causes of persistent disability of young people. Despite the presence of advanced treatments that modify the disease, there is a need for comprehensive rehabilitation measures to improve quality of life. Fatigue is as very common symptom in the structure of neurological disorders in patients with MS, which deepens disability and affects quality of life. Non-invasive neuromodulation, in this case rhythmic transcranial magnetic stimulation (rTMS), can act as a tool by activating or inhibiting certain areas of the brain cortex, in the mode required for a particular patient, leading to an improvement of its functions, and promoting neuroplasticity.

OBJECTIVE

The aim of the present study was to evaluate the overall fatigue improvement by applying rTMS in a group of MS patients.

METHODS

7 patients (33 to 68 yrs), both genders, answered the MFIS (Modified Fatigue Scale Impact Scale) before starting to receive rTMS and at the end of the study. The two scores were then tested for statistical significance, considering statistically significant, values of $p<0.05$. The rTMS protocol consisted of 20 randomized crossover sessions, split in two 10 sessions groups, with one month washout interval in between. So that each patient received active rTMS and sham applications. The used parameters were: Primary motor cortex (Cz):10Hz, 50 pulses per train, 30 trains, 20 seconds interval with a total 1500 pulses at 90% of resting motor threshold (RMT); Left prefrontal dorsolateral cortex (F3):10Hz, 50 pulses per train, 40 trains, 20 seconds interval with a total 2000 pulses at 110% RMT.

RESULTS

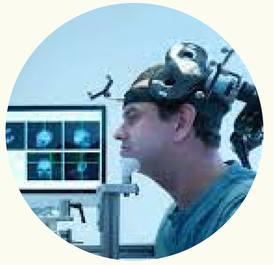
7 patients joined the study, and all off them showed some degree of overall fatigue improvement in both motor and psychosocial aspects. The MFIS mean score, before the rTMS was 32.43±9.78 ($p<0.05$) and at the end of the study 20±8.04 ($p<0.05$). Positive changes were observed in the gait function of some patients.

CONCLUSIONS

The use of rTMS has a positive effect on the manifestations of fatigue, in patients with MS. Non-invasiveness, safety and ease of use, the possibility of differentiated use allow use of rTMS in the clinic and become an important component of active drug and non-drug rehabilitation of patients.

BIBLIOGRAPHIC REFERENCES

- Padalino M, Scardino C, Zito G, Cancelli A, Cottone C, Bertoli M, et al. Effects on motor control of personalized neuromodulation against multiple sclerosis fatigue. Brain Topogr. 2021;34(3):363-372.
- Ślusarz R, Olkiewicz J, Bonek R, Filipska K, Biercewicz M, Wiśniewski A. The impact of motor disability and the level of fatigue on adherence to therapeutic recommendations in patients with multiple sclerosis treated with immunomodulation. Int J Med Sci. 2021;18(15):3609-14.



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