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Evaluating the effect of transcranial magnetic stimulation over the lateral cerebellum on cortical excitability

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Objective: Cerebellum modulates motor movements through the cerebello-thalamo-cortical pathway. Therefore, cerebellar transcranial magnetic stimulation (TMS) is known as a valuable method that modulates connection between the primary motor cortex and cerebellum, affecting cortical excitability. The effects of different TMS protocols applied over the cerebellum on cortical excitability have been evaluated in several studies including healthy individuals or patients with central nervous system diseases. Theta burst stimulation (TBS), one of the repetitive TMS methods, is thought to be more effective and long lasting compared to conventional rTMS methods. In this study, we aimed to evaluate the effect of intermittent TBS (iTBS) and continuous TBS (cTBS), which are known to have opposite effects, and sham TBS on cortical excitability.

Methods: Resting motor thresholds (RMT), MEP amplitudes, cortical silent periods (CSP) were tested in the contra-lateral M1 in subjects in order to assess cortical excitability before and after TBS application over the lateral cerebellum in 20 male healthy volunteers.

Results: We found that iTBS induced a reduction in MEPs amplitude while cTBS showed no significant differences in MEPs amplitude. No significant differences were found in terms of RMT, CSP parameters before and after the application, for each TBS group. Procedure related side effects were not observed in any subject.

Conclusions: Cerebellar TMS is a safe method and further research is warranted to elucidate the role of the cerebellar circuitry in motor control. Providing optimal cerebellar TMS protocols is useful to obtain potential mechanisms for the treatment and rehabilitation of different diseases.

Biography

Arsida Bajrami has completed his PhD from Istanbul University, Cerrahpasa Medical Faculty and is currently ongoing her Post-doctoral studies in Bakirkoy Dr. Sadi Konuk Training and Research Hospital, Department of Neurology.

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