Repetitive transcranial magnetic stimulation (rTMS) combined with treadmill training has been suggested to modulate corticomotor activity and improve gait performance in people with Parkinson's disease.

It is unclear whether this combination therapy has a similar effect in people with stroke.

Review

Studies included in a review were identified by searching PubMed and ISI Web of Science. The search terms were (rTMS OR "repetitive transcranial magnetic stimulation") AND (stroke OR "cerebrovascular accident" OR CVA) AND (rehab OR rehabilitation OR recover*). The retrieved records were assessed for eligibility and the most relevant features extracted to a summary table.

Seventy out of 691 records were deemed eligible, according to the selection criteria. The majority of the articles report rTMS showing potential in improving motor function, although some negative reports, all from randomized controlled trials, contradict this claim. Future studies are needed because there is a possibility that a bias for non-publication of negative results may be present.

rTMS has been shown to be a promising tool for stroke rehabilitation, in spite of the lack of standard operational procedures and harmonization. Efforts should be devoted to provide a greater understanding of the underlying mechanisms and protocol standardization ¹⁾.

Case series

A study of Wang et al., from the Taipei Veterans General Hospital aimed to investigate whether highfrequency rTMS enhances the effects of subsequent treadmill training in individuals with chronic stroke.

Fourteen participants meeting the selection criteria were randomly assigned to either the experimental (n = 8) or control (n = 6) group. The experimental group received 5 Hz rTMS prior to treadmill training three times per week for 3 weeks. The control group received sham rTMS before treadmill training. Walking speed, gait symmetry, corticomotor excitability, motor function of the lower extremities, and muscle activity during walking were measured before intervention, after intervention, and at 1-month follow-up.

The walking speed, spatial asymmetry of gait, and motor function of the lower extremities improved significantly in the experimental group, and these improvements exhibited significant differences in between-group comparisons. However, there was no significant difference in corticomotor excitability or brain asymmetry ratio after the intervention in each group.

The current results revealed that applying 5 Hz high-frequency rTMS over the leg motor cortex in the affected hemisphere enhanced the effects of subsequent treadmill training on gait speed and spatial

asymmetry in individuals with chronic stroke. Improvement in gait speed persisted for at least 1 month in individuals with chronic stroke $^{2)}$.

Bates and Rodger, used it in motor functional recovery from cerebral ischemic stroke to illustrate the difficulties in interpreting and assessing the therapeutic potential of rTMS for neurotrauma in terms of the presumed mechanisms of action of rTMS 3 .

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1)

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