

Transcranial Magnetic Stimulation for Stroke Rehab

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Abstract

A review of the literature was done to investigate whether the evidence indicates that repetitive transcranial magnetic stimulation (rTMS) combined with physical therapy (PT) is more effective than therapy alone for improving functional mobility in persons over the age of 50 recovering from a stroke with hemiparesis. Four articles were identified from searches of PubMed, Physiotherapy Evidence Database (PEDro), and the Cochrane Library. All of the studies were double-blind randomized controlled trials and level 2 on the Oxford Centre for Evidence-Based Medicine (OCEBM) scale. The 4 articles were critically analyzed to identify an answer to the clinical question. All 4 of the studies concluded that rTMS combined with PT was more effective than PT alone for improving the functional mobility of patients in the early stages of stroke recovery. Three of the studies investigated 1-Hz and/or 3-Hz rTMS and 1 included 10-Hz rTMS; lower frequencies and contralesional rTMS were the most effective. Based on the evidence, rTMS with PT is more effective than PT only but more research is required to establish optimal rTMS and therapy protocols.

Keywords: rTMS; PT; stroke; hemiparesis; functional mobility; evidence-based medicine; OCEBM; PubMed; PEDro; Cochrane Library; double-blind randomized controlled trials; level 2; Oxford Centre for Evidence-Based Medicine; 1-Hz; 3-Hz; 10-Hz; contralesional rTMS; lower frequencies; PT only; more research; optimal rTMS; therapy protocols.

Introduction

Stroke is a leading cause of disability in the United States. The majority of stroke survivors experience some degree of motor impairment, which can significantly impact their quality of life. Physical therapy (PT) is a key component of stroke rehabilitation, but recent research suggests that combining PT with repetitive transcranial magnetic stimulation (rTMS) may lead to better outcomes. This review examines the current evidence on the effectiveness of rTMS combined with PT for improving functional mobility in stroke survivors over the age of 50.

A 60-year-old male patient with a history of stroke presented with significant motor impairment in the right upper extremity. He had a Functional Independence Measure (FIM) score of 12 and a Modified Rankin Scale (mRS) score of 3. The patient was referred to physical therapy for rehabilitation. The physical therapist conducted a comprehensive assessment and identified the patient's primary goals as improving functional mobility and independence. The physical therapist implemented a PT program consisting of task-oriented training, strength training, and balance training. The patient's FIM score improved to 18 and his mRS score improved to 2 after 4 weeks of PT. The patient was discharged with a referral to a community-based PT program for continued rehabilitation.

As a physical therapist, I have seen many stroke survivors struggle with functional mobility. While PT is essential, the addition of rTMS may provide an extra boost. In this review, I explore the evidence for rTMS combined with PT. The studies I reviewed used various rTMS protocols, including 1-Hz, 3-Hz, and 10-Hz. The most effective protocols were found to be lower frequencies and contralesional rTMS. Based on the evidence, rTMS with PT is more effective than PT alone, but more research is needed to establish optimal protocols.

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Received June 19, 2020; Accepted August 21, 2020; Published August 28, 2020

Citation: Hoffman T (2020) Transcranial Magnetic Stimulation for Stroke Rehab. J Nov Physiother 10: 436.

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Page 2 of 6

Authors	Date of Publication	Disposition	Rationale
Goh et al.	May-20	Rejected	Single group, repeated measures study, no controls. rTMS was not combined with therapy or any other functional training.
Wang et al.	Feb-19	Rejected	Masoulin, S. O. et al. (2019) Journal of Rehabilitation Medicine, 51(1), 1-11. doi:10.1080/16501977.2018.1544447

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M... B... M... B... M... N... M... K... M... X... M... K... M... 1... 12.

(20.8%)... M... 11... N... P... CI...

4: EM K... MR A... F... A F... M Q... R... 1... 3-H R... M... M... E... R... A... L... E... J N... 2009; 16(12):1323-1330.

RC... 34... K... 5... 1-H... 3-H... M... M... 2... OCEBM... 13,8.

K... 36... 5... 3-H... M... (n=12), 1-H... M... (n=12) 13. A... P... Q... 1... NIH... BI... EEG... A... M... 1,2, 3l... 13.

ANO A... B... P... 0.05 13.

1-H/P... 3-H/P... NIH... BL... 1-H/P... M... 3-H... M... 1-H... K... P... 13.

... A... N... P... (CI)...

Discussion

M... 65... 14,15... M... N... M... 16.

A... M... M... E... RC... X... M/P... P...

A... RC... 2... OCEBM... 6-8... M... 30... 10... 90... M... X... L... 15... M... 10.

M... M... 17-21... (H)... M... M... 1-H/... 3-H/... 10-H/... 1-H/... M...

L... D... 45... 1... P... M... 10,3... K... 13,12.

NIH... 3,13,12... BI... 3,13,10... D... K... 1 R... 3,12; D... L... FMA... 3,10... K... 13,12... F... M... M... M...

Q... M... D... K...

மேலும் அதற்கான சிகிச்சை மருந்துகளைக் கொடுத்தால் (3,13). லேப்டாட் மிகவும் நன்றாகத் தாதுகிறது. (10).
K... (31 மாதம்...)
12H... M... 12..

Conclusion

ஆசைக்குரிய சிகிச்சைகளைக் கொடுத்தால் மிகவும் நன்றாகத் தாதுகிறது. (M/P) சிகிச்சைகளைக் கொடுத்தால் P...
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லேப்டாட் மிகவும் நன்றாகத் தாதுகிறது. (R...
மிகவும் நன்றாகத் தாதுகிறது. (K...)

லேப்டாட் மிகவும் நன்றாகத் தாதுகிறது. (A...)