

High frequency repetitive transcranial magnetic stimulation (rTMS) combined with body weight supported treadmill training (BWSTT) after stroke: a pilot study

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Background:

There is growing evidence supporting the use of non-invasive brain stimulation, such as repetitive transcranial magnetic stimulation (rTMS), in motor recovery after stroke, primarily arm and hand motor function. The application of rTMS in gait recovery in stroke is relatively unexplored.

Objective:

to determine the feasibility and efficacy of high frequency rTMS applied to bilateral motor areas as an adjuvant intervention to body-weight supported treadmill training (BWSTT) in individuals with subacute stroke.

Methods:

This is a double-blinded sham-controlled pilot trial. In this pilot study, 5 individuals with subacute stroke will be randomly assigned to either real or sham rTMS group. The real rTMS group will receive 5Hz rTMS applied to the bilateral primary motor cortex leg areas prior to BWSTT while the sham group receive sham stimulation. The training involves 24 sessions over 10 weeks and each session consists of a 30-minute rTMS session and a 45-minute gait training. The primary outcome of the study is individual's over ground gait speed. A blinded tester will collect the outcome before and after the 10-week intervention. In addition to gait speed, we will also measure participant's spatial-temporal gait parameters, walking endurance, and quality of life. Neurophysiological changes associated with the intervention will be captured with TMS-related measures, including motor threshold and motor evoked potential amplitude. Number of adverse events and protocol compliance will be used to quantify the feasibility of the protocol. Data will be analyzed descriptively and effect size will be computed.

Expected Outcome:

The data acquired in this pilot trial will be used as preliminary data in subsequent extramural grant applications and used to perform sample size estimation for a larger randomized controlled trial in which the efficacy of the rTMS will be statistically tested.