Background

Repetitive Transcranial Magnetic Stimulation (rTMS) is an emerging technology to augment motor recovery in children with stroke. The purpose of this study was to evaluate the long-term safety of rTMS in our previous clinical trial "Pediatric Hemiparesis: Synergistic Treatment using Repetitive Transcranial Magnetic Stimulation (rTMS) and Constraint Induced Movement Therapy (CIMT)." 1

The original clinical trial compared real versus sham rTMS intervention with all receiving CIMT.1

Magnetic Stimulation (rTMS) and Constraint Induced Movement Therapy “Pediatric Hemiparesis: Synergistic Treatment using Repetitive Transcranial Magnetic Stimulation (rTMS) and Constraint Induced Movement Therapy (CIMT)”

Methodology

Figure 1. Study Techniques. 1a. Child receiving rTMS. 1b. Child engaged in CIMT.

Figure 2. Study Design and Participant Group Assignment

Research Participants:
Age Range: Median age: 13.5 years, Range: 11-20 years old
Gender: 50% male
Time since original participation varied
At long-term follow-up, safety was evaluated through:
• Interview
• Assisting Hand Assessment (AHA)
• Co-Occurring conditions subjectively reported
• Canadian Occupational Performance Measure (COPM)

Figure 3. Time since study participation per individual participant. Range: 21-57 months.

Analysis:
• Non-parametric statistics using frequency counts
Interview themes focused on
• Study retention
• Self-awareness
• Cast challenges
• Strategies impacting success

Discussion

Interview: Participants and families recommended:
• Child-friendly communication and recruitment information to alleviate anxiety and manage expectations of outcomes
• Use of distractions for study related tasks (e.g. MRI scans, TMS testing sessions)
• Potential assistance in discussing disability with peers if a child has not developed self-advocacy skills

AHA: AHA scores were variable with highly efficient compensatory strategies noted in older participants.

Co-Occurring Conditions: Preliminary long-term safety exists for the use of rTMS when paired with CIMT in children with hemiparesis.

COPM: COPM use contributed to a greater understanding of how the child prioritizes goals targeting a change in function

References


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