



Positive effects of repetitive transcranial magnetic stimulation on attention in ADHD Subjects: a randomized controlled pilot study.

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Abstract

OBJECTIVES: Repetitive transcranial stimulation (rTMS) affects dopaminergic secretion in the prefrontal cortex. Attention deficit hyperactivity disorder (ADHD) had been suggested to involve dopaminergic prefrontal abnormalities.

METHODS: In this crossover double-blind randomized, sham-controlled pilot study, patients diagnosed as having adult ADHD received either a single session of high-frequency rTMS directed to the right prefrontal cortex (real rTMS) or a single session of sham rTMS.

RESULTS: A total of 13 patients (seven males, six females) who fulfilled the criteria for adult ADHD, according to DSM-IV criteria gave informed consent and were enrolled. There was a specific beneficial effect on attention 10 minutes after a real rTMS course. The post-real rTMS attention score improved significantly ($M=3.56$, $SD=0.39$) compared to the pre-real rTMS attention score ($M=3.31$, $SD=0.5$) [$t(12)=2.235$, $P < 0.05$]. TMS had no effect on measures of mood and anxiety. The sham rTMS had no effect whatsoever.

CONCLUSIONS: Our findings should encourage future research on the possibility of amelioration of attention difficulties in patients suffering from ADHD by using high frequency rTMS directed to the right dorsolateral prefrontal cortex. (NIH registry [NCT00825708](#)).

PMID: 20521875 DOI: [10.3109/15622975.2010.484466](#)


[Indexed for MEDLINE]

Publication types, MeSH terms, Substance, Secondary source ID

LinkOut - more resources

Autism

Clinical effectiveness of repetitive transcranial magnetic stimulation treatment in children and adolescents with neurodevelopmental disorders: A systematic review

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First Published January 20, 2019 | Review Article

<https://doi.org/10.1177/1362361318822502>



Abstract

Neurodevelopmental disorders, including autism spectrum disorder, are common in children and adolescents, but treatment strategies remain limited. Although repetitive transcranial magnetic stimulation has been studied for neurodevelopmental disorders, there is no clear consensus on its therapeutic effects. This systematic review examined literature on repetitive transcranial magnetic stimulation for children and adolescents with neurodevelopmental disorders published up to 2018 using the PubMed database. The search identified 264 articles and 14 articles met eligibility criteria. Twelve of these studies used conventional repetitive transcranial magnetic stimulation and two studies used theta burst stimulation. No severe adverse effects were reported in these studies. In patients with autism spectrum disorder, low-frequency repetitive transcranial magnetic stimulation and intermittent theta burst stimulation applied to the dorsolateral prefrontal cortex may have therapeutic effects on social functioning and repetitive behaviors. In patients with attention deficit/hyperactivity disorder, low-frequency repetitive transcranial magnetic stimulation applied to the left dorsolateral prefrontal cortex and high-frequency repetitive transcranial magnetic stimulation applied to the right dorsolateral prefrontal cortex may target inattention, hyperactivity, and impulsivity. In patients with tic disorders, low-frequency repetitive transcranial magnetic stimulation applied to the bilateral supplementary motor area improved tic symptom severity. This systematic review suggests that repetitive transcranial magnetic stimulation may be a promising intervention for children and adolescents with neurodevelopmental disorders. The results warrant further large randomized controlled trials of repetitive transcranial magnetic stimulation in children with neurodevelopmental disorders.