

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

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Neurodevelopmental disorders such as autism spectrum disorder (ASD) and attention deficit/hyperactivity disorder (ADHD) are common in children and adolescents, but treatment strategies remain limited. Repetitive transcranial magnetic stimulation (rTMS) is a brain stimulation therapy used for depression. Although rTMS studies have been conducted for children and adolescents with neurodevelopmental disorders, there has been no clear review of the therapeutic effects of rTMS for these disorders. Thus, we conducted a systematic review on rTMS for children and adolescents with neurodevelopmental disorders to identify all relevant articles on this topic that were published up to February 2018. The search identified 14 articles. Twelve of 14 studies used conventional rTMS and the rest of two studies used newer form of rTMS called theta burst stimulation (TBS). TBS has been shown to produce similar effects even though it needs a few minutes.

Our review of the literature showed that, in ASD, some forms of TBS may have therapeutic effects on social functioning and repetitive behaviors. In ADHD, some forms of rTMS were found to mitigate inattention, hyperactivity, and impulsivity. In tic disorders, some forms of rTMS seemed to improve tic symptom severity. Of note, no severe adverse effects were reported in all studies. This systematic review suggests that rTMS may be a potential intervention for neurodevelopmental disorders without severe adverse effects. The present review warrants further rTMS research in children and adolescents with neurodevelopmental disorders to improve the therapeutic strategy for them.