

## **Repetitive transcranial magnetic stimulation over the supplementary motor area but not on broca's area improves speech fluency in adults who stutter: a case study**

**G. Mejías, J. Prieto**

*Service of Clinical Neurophysiology, Hospital General Universitario Gregorio Marañón, Spain*

The etiology of and mechanisms underlying stuttering are largely unexplained, and limited effective treatments are available for those affected. Transcranial direct current stimulation has shown a favorable effect on fluency in adults who stutter. To date, however, no studies have investigated the effects of repetitive transcranial magnetic stimulation (rTMS) in patients with developmental stuttering. We assessed the effect of rTMS at the supplementary motor area (SMA) and in Broca's Area in a 30-year-old, right-handed man with developmental stuttering, as stuttering severity is related to increased structural connectivity of the motor response-inhibition network (composed of the supramarginal gyrus, preSMA, subthalamic nucleus, and putamen). Stimulating over SMA produce a significant decrease in %DS and SSI-4 score after 5 rTMS sessions; the fluency improvement was maintained during the subsequent 10 sessions. Unexpectedly no improvement was found when stimulation was over Broca's area. This case illustrated that rTMS over the SMA should be further researched in more subjects, along with sham stimulation, both as therapy and to explore pathophysiological principals of stuttering.