Non-Invasive Brain Stimulation Leads to Fine Motor Improvement After Stroke

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Stroke is common and accompanied by complex disabilities—such as lower and upper limb disability, speech impairment, and chronic post-stroke pain. An analysis of published studies found that non-invasive brain stimulation may have beneficial effects on fine motor movement in stroke patients and healthy participants. The findings are published in the European Journal of Neurology.

The meta-analysis examined the effects of two common non-invasive brain stimulation technologies—transcranial direct current stimulation (tDCS) and transcranial magnetic stimulation (TMS)—on hand and finger movement, like picking up objects, writing, or similarly precise tasks that are often affected after a stroke.

The investigators observed statistically significant gains in fine motor movement in stroke patients following tDCS and TMS; however, time since onset of stroke event, the severity of impairment, combination of non-invasive brain stimulation with other interventions, and risk of bias were all relevant factors. Fine motor improvement in healthy participants’ non-dominant hand (a surrogate to an impaired hand) was also observed.

“Encouragingly, research to refine these gains, understand their impact on lifestyle, and determine best responders to these types of treatments is happening now,” said lead author Dr. Anthony O’Brien, of the Spaulding Neuromodulation Center, an affiliate of Harvard Medical School.

Additional Information


About Journal

The European Journal of Neurology covers all areas of clinical and basic research in neurology, including pre-clinical research of immediate translational value for new potential treatments. Emphasis is placed on major diseases of large clinical and socio-economic importance (dementia, stroke, epilepsy, headache, multiple sclerosis, movement disorders, and infectious diseases). The journal provides a forum for European activity in clinical neuroscience and medical practice and helps strengthen the links between research workers and clinicians in Europe and other parts of the world. The journal also publishes the official EAN taskforce papers.

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