

Brain stimulation technique boosts language ability in Alzheimer's patients

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A brain stimulation technique, known as repetitive transcranial magnetic stimulation, boosts the language ability of patients with Alzheimer's disease, suggests preliminary research, published online in the *Journal of Neurology, Neurosurgery and Psychiatry*.

Repetitive transcranial magnetic stimulation, or rTMS for short, is a non-invasive technique that involves the delivery of a rapid succession of magnetic pulses in frequencies of up to 100 Hz.

Previous research has shown that this can alter [neuronal activity](#), depending on the frequency of the stimulation.

The technique, which was applied to the prefrontal lobes for 25 minutes each time at a frequency of 20 Hz, was tested in 10 patients with moderate [Alzheimer's disease](#).

Half were randomly assigned to receive four weeks of rTMS (five days a week), and half were given a dummy treatment for two weeks, followed by two weeks of rTMS.

Each participant was tested for memory, executive functions, such as planning, and language at the start of the study, then after two and four weeks, and again after eight weeks.

Significant differences emerged between the two groups after two weeks in respect of the ability of participants to understand spoken language.

The percentage of correct answers after a comprehension test rose from 66% to over 77% among those given rTMS, whereas there was no change in those given the dummy technique.

There was no further change after four weeks, but the improvements were still evident at eight weeks.

rTMS did not alter other language abilities or other cognitive functions, including memory, which suggests that the technique is specific to the [language](#) domain of the brain, when applied to the prefrontal lobes, say the authors.

It is not completely clear how the technique works. Rhythmic stimulation may alter cortical activity in the brain, so readjusting unhealthy patterns induced by disease or damage, suggest the authors.

There is some evidence to back this up as imaging studies of people with congenital or acquired brain damage have shown that certain areas of the brain seem to be plastic and that cortical activity can be "reorganised" as a result.

"The present preliminary results ... hold considerable promise, not only for advancing our understanding of brain plasticity mechanisms, but also for designing new rehabilitation strategies in patients with neurodegenerative disease," they conclude.

More information: www.jnnp.bmj.com

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