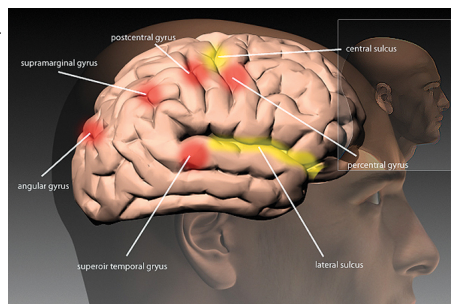


Brain stimulation reduces post-stroke neglect - Tehran Times

Health Desk

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Post-stroke hemispatial neglect improved significantly after a two-week course of magnetic stimulation of the affected brain area, according to results of a small clinical trial.

The degree of neglect improved by 16% after two weeks and by 23% after one month, as assessed by a standardized behavioral inattention test (BIT).

In contrast, patients treated with sham stimulation had no improvement in hemispatial neglect, Giacomo Koch, MD, PhD, of the Santa Lucia Foundation in Rome, and co-authors reported in the Jan. 3 issue of *Neurology*.

"These findings suggest that a two-week course of continuous theta-burst stimulation over the left hemisphere posterior parietal cortex may be a potential effective strategy in accelerating recovery from visuospatial neglect in subacute stroke patients, possibly counteracting the hyperexcitability of the left hemisphere parieto-frontal circuits," they wrote in conclusion.

"This study provides class III evidence that left posterior parietal cortex theta-burst stimulation improves hemispatial neglect for up to two weeks after treatment," the authors added.

As many as 40% of stroke patients develop hemispatial neglect, which refers to the inability to recognize or respond to stimuli on the side opposite to the brain infarction. The syndrome is particularly disabling to patients who have unilateral strokes of the right hemisphere.

Current approaches to cognitive rehabilitation for hemispatial neglect have yielded unsatisfactory results, the authors wrote.

One theory about the mechanisms of hemispatial neglect posits that right-hemisphere lesions induce pathologic overexcitability of left-hemisphere circuits.

Neuroimaging studies have implicated altered cortico-cortical connectivity in hemispatial neglect, the authors continued.

Koch and colleagues previously demonstrated increased excitability of left-hemisphere parieto-frontal cortical circuits in patients with neglect compared with other stroke patients (*Brain* 2008; 131: 3147-3155). They also found that a single session of transcranial magnetic stimulation of the left posterior parietal cortex led to transient normalization of the overexcitability and improvement in neglect.

Results of another recent study suggested that continuous theta-burst stimulation applied to the left posterior parietal cortex reduced post-stroke neglect for several hours (*Stroke* 2009; 40: 2791-2796).

Continuing the line of investigation, Koch and colleagues conducted a randomized, sham-controlled study of 20 patients who developed hemispatial neglect following right-hemisphere strokes. The investigators sought to determine whether repeated application of continuous theta-burst stimulation over two weeks would lead to further amelioration of hemispatial neglect.

Patients randomized to active therapy had two treatment sessions daily, 15 minutes apart, Monday through Friday, for two weeks. Each session consisted of three-pulse bursts at 50 Hz, repeated at 200 msec intervals for a total of 40 seconds. Treatment occurred at the same time each day.

Change in hemispatial neglect was assessed by means of the BIT battery of tests.

The two treatment groups did not differ significantly with respect to patients' age, sex, duration of illness, or baseline BIT scores. One patient in each group did not finish the study, and they were excluded from analysis.

Comparison of BIT total scores showed that patients randomized to active continuous theta-burst stimulation had significant improvement in visuospatial neglect that was evident immediately after the two-week treatment period ($P < 0.001$) and two weeks later ($P < 0.05$).

Analysis of individual BIT subtests revealed significant differences in favor of active brain stimulation for multiple assessments ($P < 0.05$ to $P < 0.001$).

The investigators assessed functional connectivity between the left posterior parietal cortex and the ipsilateral primary motor cortex by means of paired-pulse transcranial magnetic stimulation. Baseline excitability was similar in the groups.

After the two-week treatment period, active stimulation was associated with a significant reduction in the excitability of the parieto-frontal functional connections in the left hemisphere ($P < 0.05$), and values for the two groups remained significantly different at four weeks ($P < 0.05$). Researchers found that the BIT scores improved by 16.3% after two weeks of active stimulation and 22.6% at one month follow-up.

The study was limited by addition of the magnetic stimulation to standard cognitive rehabilitation so that the effect of stimulation alone could not be assessed and also by the use of only BIT rather than other neuropsychologic tests as a measure of function.

The study by Koch and colleagues "represents an important step forward in the effort to rehabilitate neglect, and presents us with some general principles that help to advance an emerging approach to neurorehabilitation," Heidi M. Schambra, MD, and Randolph S. Marshall, MD, of Columbia University in New York City, wrote in an accompanying editorial.

"Here the investigators successfully expanded a single-session approach to two weeks," they continued. "It remains to be determined whether efficacy can be further enhanced by pushing the stimulation dose higher ... or by shortening the interval between stimulation and behavioral intervention.

"There is emerging evidence that intervention beginning in the first week after stroke may improve therapeutic efficacy by taking advantage of an enhanced window of plasticity."

(Source: MedPage Today)