

Migraine patients find pain relief in electrical brain stimulation

April 20 2012, By Laura Bailey

Chronic migraine sufferers saw significant pain relief after four weeks of electrical brain stimulation in the part of the brain responsible for voluntary movement, the motor cortex, according to a new study.

Researchers from the University of Michigan School of Dentistry, Harvard University and the City College of the City University of New York used a noninvasive method called transcranial direct current stimulation (tDCS) as a preventative [migraine](#) therapy on 13 patients with chronic migraine, or at least 15 attacks a month. After 10 sessions, participants reported an average 37 percent decrease in [pain intensity](#).

The effects were cumulative and kicked in after about four weeks of treatment, said Alexandre DaSilva, assistant professor at the U-M School of Dentistry and lead author of the study, which appears in the journal *Headache*.

"This suggests that repetitive sessions are necessary to revert ingrained changes in the [brain](#) related to chronic migraine suffering," DaSilva said, adding that study participants had an average history of almost 30 years of [migraine attacks](#).

The researchers also tracked the electric current flow through the brain to learn how the therapy affected different regions.

"We went beyond, 'OK, this works,'" DaSilva said. "We also showed what possible areas of the brain are affected by the therapy."

They did this by using a high-resolution computational model. They correctly predicted that the electric current would go where directed by the electrodes placed on the subject's head, but the current also flowed through other critical regions of the brain associated with how we perceive and modulate [pain](#).

"Previously, it was thought that the electric current would only go into the most superficial areas of the cortex," DaSilva said. "We found that pain-related areas very deep in the brain could be targeted."

Other studies have shown that stimulation of the [motor cortex](#) reduces chronic pain. However, this study provided the first known mechanistic evidence that tDCS of the motor cortex might work as an ongoing preventive therapy in complex, chronic migraine cases, where attacks are more frequent and resilient to conventional treatments, DaSilva said.

While the results are encouraging, any clinical application is a long way off, DaSilva said.

"This is a preliminary report," he said. "With further research, noninvasive motor cortex stimulation can be in the future of adjuvant therapy for [chronic migraine](#) and other chronic pain disorders by recruiting our own brain analgesic resources."

More information: www.headachejournal.org/view/0/index.html;

Provided by University of Michigan

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