

Non-drug treatment for migraine based on magnetic stimulation

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A new UCSF study examining the mechanism of a novel therapy that uses magnetic pulses to treat chronic migraine sufferers showed the treatment to be a promising alternative to medication.

The therapy is called transcranial magnetic stimulation, or TMS. Study findings were presented today (April 29, 2009) during the annual American Academy of Neurology scientific meeting in Seattle.

In a previous randomized controlled clinical study by Ohio State University Medical Center, TMS was used to treat patients who suffer from migraine with aura, a condition in which a variety of mostly visual sensations come before or accompany the pain of a migraine attack. The study showed that TMS treatment was superior to the placebo given to the control group. Patients were pain-free at follow-up intervals of 2, 24 and 48 hours.

In the new study, conducted in rats, UCSF researchers focused on understanding the mechanism of action of TMS therapy -- how the treatment interacted with the brain to produce the pain-free outcomes of patients in the previous study.

The UCSF research identified potential opportunities to enhance treatment strategies in patients. One example, the study team noted, was that factors such as time and peak intensity of stimulation may be important components in the brain's response to TMS.

"The data demonstrate a biological rationale for the use of TMS to treat migraine aura," said Peter Goadsby, MD, PhD, lead investigator of the study, professor and director of the UCSF Headache Center. "We found that cortical spreading depression, known as CSD and the animal correlate of migraine aura, was susceptible to TMS therapy, with the wave of neuronal excitation blocked on over 50 percent of occasions."

The study findings showed that migraine aura responds to magnetic stimulation because TMS therapy blocks the wave of neuronal excitation, which is a biological system through which neurons become stimulated to fire. TMS creates a focused magnetic pulse that passes noninvasively through the skull, inducing an electric current to disrupt the abnormal brain waves believed to be associated with migraine, including CSD. CSD in humans precedes migraine with aura.

The American Academy of Neurology estimates that over 30 million Americans suffer from migraine, a syndrome characterized by recurrent, often excruciating headaches. The National Headache Foundation estimates that migraine causes 157 million lost workdays each year due to pain and associated migraine symptoms, resulting in a \$13 billion burden to American employers.

Further research is needed, the UCSF team said, but the findings give neurologists a potential new treatment option for [migraine](#) sufferers unable to tolerate medication, which can cause stomach bleeding and other painful side effects.

Source: University of California - San Francisco

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