Unique nerve-stimulation device proves effective against epilepsy

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Epilepsy is a common medical condition characterized by convulsions and short periods of confusion. It affects more than 50 million people worldwide. But intractable epilepsy, which affects more than 1 million Americans and is often resistant to drug treatment and surgery, is arguably worse.

But in a just completed clinical trial, a unique nerve-stimulation treatment for intractable epilepsy reduced the number of seizures by more than 50 percent. In the March edition of the journal *Neurology*, UCLA neurology professor Christopher M. DeGiorgio and colleagues report the results of the long-term pilot trial, which demonstrated the effectiveness of the new treatment, called trigeminal nerve stimulation (TNS).

The results, though preliminary, are very encouraging, DeGiorgio said. Those participating in the trial for three months saw a 66 percent reduction in the number of seizures, those participating for six months saw a 56 percent reduction and those who completed one year saw a 59 percent reduction in seizures. One of the subjects who participated for a full year had a 90-percent reduction in seizures.

The trigeminal nerve extends into the brain from the face and forehead and is known to play a role in seizure inhibition. The stimulator, about the size of a large cell phone, attaches to a belt or can slip into a pocket. Two wires from the stimulator are passed under the clothing and connected to electrodes attached to the forehead by adhesive. The

electrodes, which can be covered by a cap or scarf, transmit an electrical current to the nerve.

"People with intractable epilepsy who have continuing seizures are often drug-resistant," DeGiorgio said. "In addition, anti-seizure drugs can have significant side effects on thinking and alertness."

Epilepsy brain surgery can be very effective, he said, but some patients are not ideal candidates because there is no single focal point in the brain for their seizures.

A larger clinical trial to further test for safety and effectiveness is now underway. The investigators hope that eventually a device can be permanently implanted above the eyebrow that would stimulate the trigeminal nerve and replace the external device.

"TNS is a promising alternative mode of neurostimulation because the trigeminal nerve can be stimulated in minimally invasive fashion," DeGiorgio said. "The major branches of the trigeminal nerve in the face are located close to the surface of the skull; that allows physicians to assess response prior to permanent implantation of a future device.

"For all of these reasons, we need to find non-drug and non-surgical alternatives," he said. "The results of our study are very encouraging and support further investigation into the safety and efficacy of TNS."

Source: University of California - Los Angeles

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