

Can magnets help relieve Post-Traumatic Stress Disorder (PTSD)?

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The emotional toll of war and terrorism weigh heavily on many Israelis, but researchers at Hadassah Medical Center in Jerusalem are studying ways to help patients deal with traumatic events through a novel technique -- magnetic stimulation of the brain.

The study involves patients with post-traumatic stress disorder, or PTSD, an emotionally wrenching condition caused by exposure to traumatic events. PTSD affects about 8 percent of Israelis who have been exposed to combat, while residents in areas under fire, like Sderot, are diagnosed with the disorder in far greater numbers.

Patients with PTSD often suffer flashbacks to the traumatic event that they experienced in their lives, and the disorder can stop patients from sleeping soundly. A patient may experience a cavalcade of fear and anxiety when something triggers the memory of a traumatic event.

Treatment for PTSD frequently relies on a combination of psychotherapy and psychiatric medications. American soldiers traumatized by fighting in Iraq and Afghanistan have even been prescribed MDMA, more commonly known as Ecstasy, as part of the therapy to help them deal with the flashbacks. But the use of magnetic stimulation, which has been shown to offer moderate help with depression, could also offer hope to those suffering with PTSD who haven't responded as well to drug therapies.

The study at Hadassah Medical Center involves only nine patients, and seven of them have already finished treatment. A few of the patients are from Sderot, a city subjected to ongoing rocket attacks, where 33 percent of the children suffer from PTSD, according to a study by Tel Hai College.

"Usually, we treat PTSD when the trauma was in the past, but they still live there under the same risk, and they still have the sirens going on every now and then, and they still feel that the bombs will fall on their house," said Dr. Moshe Isserles, lead study researcher. "It's crazy that so many people in Israel are living under stress and for continued periods of time."

In the study, patients are treated for PTSD with a technique called transcranial magnetic stimulation (TMS), which the Food and Drug Administration recently cleared as a method to treat depression in the United States. With the TMS technique, doctors use a coil held

near the patient's head to produce an alternating magnetic field and stimulate regions of the brain that are crucial to the management of PTSD.

The coil uses a frequency of no more than 20 hertz, which is far lower than the level that can do harm, said Dr. Abraham Zangen, a researcher at the Weizmann Institute of Science in Jerusalem, who helped developed the coil used in the Hadassah study.

The use of TMS is meant to alter the way patients' brains handle memories of traumatic events, the doctors said. Research shows that when patients with PTSD are reminded of traumatic events, they experience activation of a structure in the brain called the amygdala, which is responsible for processing deep emotions such as fear and anxiety, Zangen said.

Patients with PTSD who are reminded of traumatic events also suffer from inhibition of the prefrontal cortex, the region of the brain that controls logic and decreases the severity of emotional responses that originate in the amygdala, he said.

Through TMS, the technique of using alternating magnetic fields, doctors working on the Hadassah study are able to stimulate the prefrontal cortex in the patients.

The treatment could blunt the effects of PTSD by strengthening the synaptic connectivity between patients' prefrontal cortex -- the region of the brain responsible for more logical thinking -- and their amygdala -- the region of the brain that processes the deep emotions associated with PTSD, Zangen said.

"In most cases, we have very nice response, very good response; not always lasting forever, not always long lasting, but a good response," he said.

One of the patients in the study has suffered from PTSD since the Yom Kippur War of 1973, when friends died at his side, Zangen said. The disorder and the flashbacks made remaining asleep difficult for the patient.

"He was really having a very severe traumatic experience with PTSD," Zangen said.

He added that the patient could sleep soundly after a couple treatments with TMS, but his condition deteriorated slightly once the treatment ended altogether. He may need further treatment, Zangen said.

The Hadassah study will end within the next six months, but the team may publish preliminary results even before then, Isserles said.

While the device has an effect on the brain, a placebo effect has been difficult to rule out in cases of depression. A study of the TMS technique by the National Institutes of Health in the United States is currently under way, and initial results could be released by early 2009.

Isserles pointed to past studies that have shown some positive results from TMS for patients suffering from depression, and he believes that the technique could be particularly

beneficial to patients with PTSD who don't respond as well to existing methods for treating the disorder.

Drugs, usually anti-depressants and anti-anxiety medications, do not treat the core symptoms of the disease, Isserles said. Psychotherapy is more effective, but he says it has proven both costly and time consuming.

"I'm not saying that there isn't any treatment that's working on PTSD," Isserles said. "Some treatments are pretty successful, but still there are many, many patients who fail with the treatments that there are right now."

Both Zangen and Isserles said that if TMS proves successful in their study, it could eventually be used to help U.S. Iraq War veterans who suffer from PTSD.

"There are many, many people with PTSD that are almost not functioning," Isserles said. "This syndrome can be very bad."