

DEEP BRAIN STIMULATION (DBS) HAS EFFICACY IN TREATING SEIZURES: FOR CLINICAL PRACTICE, THE ANSWER IS NO.

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Epilepsy is a common chronic neurological disorder affecting approximately 1-2% of the population. Despite the available treatment options (pharmacotherapy, surgery, and vagus nerve stimulation), a large percentage of patients continue to have seizures. With the success of deep brain stimulation for treatment of movement disorders, deep brain stimulation has received renewed attention as a potential treatment option for epilepsy. Many, if not most, patients with medically refractory epilepsy are not candidates for resective brain surgery. In contrast to the typically systemic and ubiquitous administration of pharmacotherapy, with the concomitant possibility of side effects, electrical stimulation can ideally be targeted to the specific brain regions involved in the seizure. In addition, responsive stimulation may provide treatment as needed, potentially reducing the likelihood of functional disruption or habituation due to continuous treatment. Open-label and small blinded trials have provided suggestive and promising evidence for the use of DBS in refractory seizures. A recent pilot study prospectively evaluated the efficacy of long-term deep brain stimulation (DBS) in medial temporal lobe (MTL) structures in patients with MTL epilepsy. After mean follow-up of 31 months (range, 12-52 months), one of 10 stimulated patients are seizure free (>1 year), one of 10 patients had a >90% reduction in seizure frequency; five of 10 patients had a seizure-frequency reduction of > or =50%; two of 10 patients had a seizure-frequency reduction of 30-49%; and one of 10 patients was a nonresponder (Boon et al, 2007). The first randomized control trial of DBS of the anterior thalamic nucleus is currently underway. However, multiple potential targets exist, because many neural regions have been implicated in seizure propagation. Currently, a number of targets for DBS are investigated including caudate, centromedian or anterior thalamic nuclei, and subthalamic nucleus. Direct stimulation of the epileptic cortical focus is another approach to the neuromodulation in epilepsy. Finally, another line of research investigates the usefulness of implantable seizure detection devices. Thus, it is difficult as yet to make any definitive judgments about the efficacy of DBS for seizure control. Future study is necessary to identify a patient population for whom this technique would be indicated, the most efficacious target, and optimal stimulation parameters. DBS is much more invasive than either transcranial magnetic stimulation or Vagus Nerve Stimulation (VNS). It remains to be seen if DBS is more efficacious compared to VNS or a change in medical regimen. In summary, DBS has not unequivocally shown sufficient evidence in treating seizures to move it out of the experimental realm into clinical practice. So the answer to the question if DBS has been shown to be effective in treating refractory seizures in clinical practice must be no.