EPILEPSY

DBS reduces seizure frequency in refractory epilepsy

A double-blind randomized controlled trial published in *Epilepsia* provides evidence that deep brain stimulation (DBS) of the anterior nucleus of the thalamus can significantly reduce the monthly seizure frequency in patients with medically refractory epilepsy. The beneficial effects of DBS were shown to last for the duration of the 2 year study, indicating that the positive effects of the treatment are not associated with the surgical procedure.

“...Seizures were reduced by a median of 40% in the stimulated group by the end of the blinded phase...”

Epilepsy is a debilitating condition that can be difficult to treat effectively with current drug therapies; ≈30% of patients with epilepsy find that antiepileptic drugs (AEDs) do not markedly reduce the number of seizures they experience. DBS has been shown to be a safe and effective therapy for the treatment of

motor symptoms in Parkinson disease, and several uncontrolled pilot studies provide evidence that DBS could reduce seizure rates in patients with medically intractable epilepsy. Robert Fisher from Stanford University, USA and colleagues have now demonstrated in a double-blind, controlled study that DBS of the anterior nucleus of the thalamus reduces the frequency of seizures in this patient group.

110 patients with severe refractory epilepsy, who previously had not perceived any beneficial effects from at least three different AEDs, fulfilled the study inclusion and exclusion criteria. DBS electrodes were implanted bilaterally into the anterior nucleus of the thalamus in these patients. “Seizures were reduced by a median of 40% in the stimulated group by the end of the blinded phase, compared to 15% in the placebo group, [and] complex partial seizures, seizures considered ‘most severe’ by the patients, and seizure-related injuries were reduced in the blinded phase for those receiving stimulation,” reports Fisher. After the 3 month blinding phase, all patients

received DBS. “Seizure rates continued to improve in the open-label phase over time; seizure rates decreased by 56% after 2 years of treatment and by 68% after 3 years of stimulation,” explains Fisher. Importantly, however, no deaths, brain infections or symptomatic brain hemorrhages were attributed to stimulation: “more patients in the stimulated group reported side effects consistent with depression—usually worsening of pre-existing depression—and memory problems.”

Bilateral DBS of the anterior nucleus of the thalamus seems to be a relatively safe means of treating medically intractable epilepsy. Further research should identify which patients are most likely to benefit from this procedure, and establish which stimulation protocol is most effective at providing relief from seizures.

Nick Jones

Original article Fisher, R. *et al.* Electrical stimulation of the anterior nucleus of the thalamus for treatment of refractory epilepsy. *Epilepsia* doi:10.1111/j.1528-1167.2010.02536.x