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### Safety and Efficacy of Electroconvulsive Therapy for Depression in the Presence of Deep Brain Stimulation in Obsessive-Compulsive Disorder

**To the Editor:** In an important recent article, Fontenelle et al<sup>1</sup> reviewed published reports of electroconvulsive therapy (ECT) in patients with obsessive-compulsive disorder (OCD), finding inconclusive evidence for efficacy of ECT in OCD despite clinical improvement in about 60% of published cases. ECT remains the most effective treatment for severe depression and can be lifesaving.<sup>2</sup> Because OCD is often comorbid with severe depression, ECT remains an important treatment consideration in this patient population. Here we report the case of a patient with treatment-resistant OCD and depression, both of which improved with ECT in the presence of bilateral deep brain stimulation (DBS).

**Case report.** Mr A, a 47-year-old single man, had been diagnosed at intake with OCD (according to *DSM-IV* criteria) with onset in his teenage years. His illness was severe and disabling and had resulted in multiple hospitalizations, extensive exposure and response prevention therapy, multiple antidepressant and

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other psychotropic drug trials, and a trial of repetitive transcranial magnetic stimulation. The patient presented to our clinic severely depressed and had a course of ECT with good antidepressant response and some improvement in his OCD. Because his OCD symptoms recurred about 2 years later, DBS was recommended. Mr A underwent ventral capsule/ventral striatum (VC/Vs) DBS implantation in May 2013 under the auspices of the Food and Drug Administration's Human Device Exemption.<sup>3</sup>

Deep brain stimulation resulted in a reduction in his Yale-Brown Obsessive Compulsive Scale<sup>4</sup> (Y-BOCS) score from the extreme to moderate/severe range (Y-BOCS = 33 at baseline, 24 at 6 weeks post activation). His obsessive-compulsive symptoms remained stable over the following 2 years (Y-BOCS = 23 at 22 months); however, 2 years following DBS activation, the patient reported worsening depression (confirmed according to *DSM-IV* criteria) and suicidal ideation.

After failing to respond to both medication and DBS adjustments, the patient underwent 3 inpatient ECT treatments with bitemporal electrode placement over 1 week. Deep brain stimulation was turned off and, additionally, voltage was set to 0 as a safeguard against inadvertent DBS reactivation.<sup>5,6</sup> The treatments were well tolerated. Electroconvulsive therapy reduced depressive symptoms from severe to mild (Hamilton Depression Rating Scale<sup>7</sup> [HDRS] = 24 at baseline, 7 at discharge) and reduced OCD symptoms from severe to moderate (Y-BOCS = 26 at baseline, 16 at discharge). Mr A underwent 2 more ambulatory ECT treatments over the following 2 weeks, during which time his obsessive-compulsive and depressive symptoms fluctuated. One week later, DBS was reactivated. Presently, he remains stable (HDRS = 12, Y-BOCS = 24 at 1 month post reactivation).

Despite theoretical risks,<sup>8,9</sup> 9 cases of ECT in the presence of DBS have been reported without adverse outcomes. DBS was implanted in these cases to treat Parkinson's disease (subthalamic nucleus<sup>5,10-12</sup> and ventral intermediate nucleus<sup>13</sup> targets), essential tremor (ventral intermediate nucleus target<sup>6,14</sup>), depression (subcallosal cingulum target<sup>15</sup>), and cervical dystonia (globus pallidus target<sup>16</sup>), respectively. This is the first report of ECT in the presence of DBS for OCD. We report this case both to add to the evidence base for the safety of ECT with implanted DBS and to highlight the importance of ECT as a treatment for severe depression in patients with comorbid OCD.

## REFERENCES

1. Fontenelle LF, Coutinho ES, Lins-Martins NM, et al. Electroconvulsive therapy for obsessive-compulsive disorder: a systematic review. *J Clin Psychiatry*. 2015;76(7):949–957.
2. Kellner CH, Greenberg RM, Murrough JW, et al. ECT in treatment-resistant depression. *Am J Psychiatry*. 2012;169(12):1238–1244.
3. Food and Drug Administration. Letter to Patrick L. Johnson, Medtronic Neuromodulation, from Donna-Bea Tillman, director, Office of Device Evaluation, Center for Devices and Radiologic Health. Silver Spring, MD: FDA; 2009 Feb.

4. Goodman WK, Price LH, Rasmussen SA, et al. The Yale-Brown Obsessive Compulsive Scale, I: development, use, and reliability. *Arch Gen Psychiatry*. 1989;46(11):1006–1011.
5. Bailine S, Kremen N, Kohen I, et al. Bitemporal electroconvulsive therapy for depression in a Parkinson disease patient with a deep-brain stimulator. *J ECT*. 2008;24(2):171–172.
6. Quinn DK, Rees C, Brodsky A, et al. Catatonia after deep brain stimulation successfully treated with lorazepam and right unilateral electroconvulsive therapy: a case report. *J ECT*. 2014;30(3):e13–e15.
7. Hamilton M. A rating scale for depression. *J Neurol Neurosurg Psychiatry*. 1960;23(1):56–62.
8. Zhi-De D, Hardesty DE, Lisanby SH, et al. Electroconvulsive therapy in the presence of deep brain stimulation implants: electric field effects. Conference Proceedings of the 32nd Annual International Conference of the IEEE. August 31–September 4, 2010; Buenos Aires, Argentina: 2049–2052.
9. Gahr M, Connemann BJ, Freudenmann RW, et al. Safety of electroconvulsive therapy in the presence of cranial metallic objects. *J ECT*. 2014;30(1):62–68.
10. Chou KL, Hurtig HI, Jaggi JL, et al. Electroconvulsive therapy for depression in a Parkinson's disease patient with bilateral subthalamic nucleus deep brain stimulators. *Parkinsonism Relat Disord*. 2005;11(6):403–406.
11. Nasr S, Murillo A, Katarivala N, et al. Case report of electroconvulsive therapy in a patient with Parkinson disease concomitant with deep brain stimulation. *J ECT*. 2011;27(1):89–90.
12. Ducharme S, Flaherty AW, Seiner SJ, et al. Temporary interruption of deep brain stimulation for Parkinson's disease during outpatient electroconvulsive therapy for major depression: a novel treatment strategy. *J Neuropsychiatry Clin Neurosci*. 2011;23(2):194–197.
13. Chang VC, Hardesty DE, Ford B, et al. Electroconvulsive therapy for depression in a patient with right sided VIM DBS. Final Program of the 11th International Congress of Parkinson's Disease and Movement Disorders. June 3–7, 2007; Istanbul, Turkey: Abstract 688.
14. Moscarillo FM, Annunziata CM. ECT in a patient with a deep brain-stimulating electrode in place. *J ECT*. 2000;16(3):287–290.
15. Puigdemont D, Portella MJ, Pérez-Egea R, et al. Depressive relapse after initial response to subcallosal cingulate gyrus-deep brain stimulation in a patient with a treatment-resistant depression: electroconvulsive therapy as a feasible strategy. *Biol Psychiatry*. 2009;66(5):e11–e12.
16. Vila-Rodriguez F, McGirr A, Tham J, et al. Electroconvulsive therapy in patients with deep brain stimulators. *J ECT*. 2014;30(3):e16–e18.

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