Deep brain stimulation sites for OCD target distinct symptoms

Two DBS sites equally reduced OCD symptoms but improved distinct symptoms, according to a study in Biological Psychiatry

Philadelphia, March 7, 2019 – Deep brain stimulation (DBS) reduces symptoms of severe obsessive–compulsive disorder (OCD) during stimulation of either the ventral capsule (VC) or anteromedial subthalamic nucleus (amSTN), according to a study in Biological Psychiatry. DBS of the regions reduced OCD symptoms to a similar extent, but produced distinct effects on specific symptoms—VC stimulation drastically improved mood, whereas amSTN stimulation in the same patients improved cognitive flexibility. The findings suggest that both regions are effective DBS sites for treating OCD, and that unique brain networks targeted in each region underlie specific symptoms of the disorder.

“This is the first study to compare directly the effects of DBS at two brain sites and has discovered important information about the brain changes in OCD responsible for obsessions and compulsions, depressed mood and cognitive inflexibility and how they might be alleviated,” said senior author Eileen Joyce, PhD, The Institute of Neurology, University College London, London, UK.

Using tractography to map the brain regions that were activated by DBS, Dr. Joyce and colleagues found that the different effects of VC and amSTN stimulation appeared to arise from DBS modulation of different brain networks. This finding provides clues as to the roles that those specific brain regions play in OCD, and has potentially important implications for treatment.

“The notion that particular OCD symptom clusters might particularly benefit from stimulation of distinct brain sites raises the possibility of bringing a precision medicine approach to deep brain stimulation,” said John Krystal, MD, Editor of Biological Psychiatry. “It also raises the question of whether multiple brain stimulation sites might be required to produce the broadest profile of efficacy,” he added. However, in the study, combined DBS of both sites did not produce substantially greater effects than either of the sites individually.

“Deep brain stimulation is an emerging treatment for a small number of individuals with extremely severe OCD whose condition has not responded to multiple courses of currently available treatments such as medication or cognitive behavioral therapy,” said Dr. Joyce. Cognitive behavioral therapy is an effective treatment for many people with OCD, but when combined with DBS in the study, it did not further enhance the symptom improvements produced by DBS.

For people with severe OCD whose symptoms don’t improve with the standard treatment methods, the findings show that DBS of VC or amSTN are equally effective and have unique effects for specific symptoms.
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Notes for editors

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The authors’ affiliations and disclosures of financial and conflicts of interests are available in the article.

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