



Media contact

Rhiannon Bugno

+1 214 648 0880

BPCNNI@sobp.org

Alterations in hippocampal structural connections differentiate responders of electroconvulsive therapy

A study in Biological Psychiatry: Cognitive Neuroscience and Neuroimaging investigates the biological mechanisms of electroconvulsive therapy response in depression

Philadelphia, January 15, 2019 – A new [study](#) in people with major depression reports that electroconvulsive therapy (ECT) induces changes in the fibers connecting the hippocampus to brain regions involved in mood and emotion. Only patients who responded to the treatment showed these changes, and those who had the greatest changes in hippocampal pathways also showed the largest improvements in mood.

The study, conducted by researchers at University of California, Los Angeles, was published in [Biological Psychiatry: Cognitive Neuroscience and Neuroimaging](#).

The findings reveal that ECT causes subtle changes in the structural integrity of the fiber paths, which can affect how well information is transferred between brain regions. “The nature of these changes suggests plasticity in the brain’s structural connections contribute to successful therapeutic response,” said senior author Katherine Narr, PhD.

“ECT is highly effective for treating patients with severe depression who have not benefited from standard antidepressant treatments. However, researchers are still trying to understand how and why ECT works to improve depressive symptoms,” said Dr. Narr.

So Dr. Narr and colleagues conducted brain scans of the hippocampus—the brain region most affected by depression—in people with the disorder before and after ECT, and assessed the participants’ changes in mood. Because the changes in structural integrity of the hippocampal pathways were only observed in patients who responded to ECT, the findings suggest that ECT produces its therapeutic effects in the brain by improving this structural integrity.

“These data add to the growing evidence that response to ECT is associated with changes in brain structure, in this case anatomical measures of white matter, in individuals undergoing this treatment for major depression,” said Cameron Carter, MD, Editor of *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging*.

Hippocampal structural connectivity before ECT was not related to treatment response, meaning that the measures can’t be used to predict how a patient will respond to ECT. Despite that, the connection between the structural changes induced by ECT and therapeutic response suggests that changes of hippocampal structural connectivity could be used during the development of new treatments to test how well they might work.

Notes for editors

The article is "Variations in hippocampal white matter diffusivity differentiate response to electroconvulsive therapy in major depression," by Antoni Kubicki, Amber M. Leaver, Megha Vasavada, Stephanie Njau, Benjamin Wade, Shantanu H. Joshi, Joana Loureiro, Gerhard Helleman, Roger P. Woods, Randall Espinoza, and Katherine L. Narr (<https://doi.org/10.1016/j.bpsc.2018.11.003>). It appears in *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging*, published by Elsevier.

Copies of this paper are available to credentialed journalists upon request; please contact Rhiannon Bugno at BPCNNI@sobp.org or +1 214 648 0880. Journalists wishing to interview the authors may contact Katherine Narr at narr@ucla.edu or +1 310 267 5119.

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

Cameron S. Carter, MD, is Professor of Psychiatry and Psychology and Director of the Center for Neuroscience at the University of California, Davis. His disclosures of financial and conflicts of interests are available [here](#).

About *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging*

Biological Psychiatry: Cognitive Neuroscience and Neuroimaging is an official journal of the [Society of Biological Psychiatry](#), whose purpose is to promote excellence in scientific research and education in fields that investigate the nature, causes, mechanisms and treatments of disorders of thought, emotion, or behavior. In accord with this mission, this peer-reviewed, rapid-publication, international journal focuses on studies using the tools and constructs of cognitive neuroscience, including the full range of non-invasive neuroimaging and human extra- and intracranial physiological recording methodologies. It publishes both basic and clinical studies, including those that incorporate genetic data, pharmacological challenges, and computational modeling approaches. www.sobp.org/bpcnni

About Elsevier

[Elsevier](#) is a global information analytics business that helps institutions and professionals advance healthcare, open science and improve performance for the benefit of humanity. Elsevier provides digital solutions and tools in the areas of strategic research management, R&D performance, clinical decision support and professional education, including [ScienceDirect](#), [Scopus](#), [SciVal](#), [ClinicalKey](#) and [Sherpath](#). Elsevier publishes over 2,500 digitized journals, including *The Lancet* and *Cell*, 38,000 e-book titles and many iconic reference works, including *Gray's Anatomy*. Elsevier is part of [RELX Group](#), a global provider of information and analytics for professionals and business customers across industries.

www.elsevier.com

Media contact

Rhiannon Bugno, Editorial Office

Biological Psychiatry: Cognitive Neuroscience and Neuroimaging

+1 214 648 0880

BPCNNI@sobp.org