Press Release

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Posttraumatic brain activity predicts resilience to PTSD

Imaging study in Biological Psychiatry: Cognitive Neuroscience and Neuroimaging *provides hints to PTSD pathology*

Philadelphia, September 21, 2023 – After a traumatic experience, most people recover without incident, but some people – between 2% and 10%– develop posttraumatic stress disorder (PTSD), a mental health condition that can cause debilitating symptoms of anxiety due to emotional dysregulation. PTSD symptoms are present in up to 40% of trauma survivors in the acute aftermath of trauma, but full-blown PTSD develops in only a small subset of cases. Early identification of those at risk is critical for both early treatment and possible prevention.

A new study led by Israel Liberzon, MD, at Texas A&M University, aimed to do just that. The study appears in *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging*, published by Elsevier.

Researchers have long understood that PTSD involves altered brain processing in areas associated with emotion processing and modulation, including the amygdala, insula, and prefrontal cortex. But, it has remained unclear when the PTSD-associated differences arise. In this work, the researchers collected brain scans from 104 survivors of trauma – usually a car accident – at 1, 6, and 14 months after the accident. By looking at brain activity so soon after the trauma, the researchers hoped to identify predictors of who would be more at risk or resilient to developing chronic PTSD.

Dr. Liberzon said of the findings, *"In this largest-to-date, prospective study of early post-trauma survivors, greater activation in right inferior frontal gyrus, a region linked to cognitive control and emotional reappraisal, predicts better recovery from early PTSD symptoms. These findings highlight the key roles of cortical/cognitive regions in regulation of fear and in PTSD development."*

Importantly, the researchers saw changes in the patients' brain activity change over time, reflecting an ongoing, perhaps pathological process.

Cameron Carter, MD, Editor of *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging*, said of the study, *"These findings highlight the key role that the prefrontal cortex may play in conferring resilience to the harmful effects of trauma, through its function representing contextual information and regulating emotional responses."*

Dr. Liberzon added, *"Understanding brain circuits linked to the progression of PTSD from an acute to a chronic condition is critical for understanding its pathophysiology, and eventually for the development of mechanism-informed treatment. The results might also help clinicians to start identifying and treating early trauma survivors at greater risk of developing chronic PTSD a year after the traumatic event."*

Notes for editors

The article is "Greater Early Post-Trauma Activation in Right Inferior Frontal Gyrus Predicts Recovery from Posttraumatic Stress Disorder Symptoms," by Jony Sheynin, Yana Lokshina, Samira Ahrari, Tetiana Nickelsen, Elizabeth R. Duval, Ziv Ben-Zion, Arieh Y. Shalev, Talma Hendler, and Israel Liberzon (https://doi.org/10.1016/j.bpsc.2023.07.002). It appears as an Article in Press 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. Journalists wishing to interview the authors may contact Israel Liberzon at liberzon@tamu.edu.

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.

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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. The 2022 Journal Impact Factor™ score, from Clarivate, for *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging* is 5.9.
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