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Amygdala activity predicts posttraumatic stress disorder

Reports new study in Biological Psychiatry

Philadelphia, PA, June 8, 2017 – Neuroimaging measures of emotional brain function after acute trauma may help predict whether a person will develop posttraumatic stress disorder (PTSD), according to a [new study](#) in *Biological Psychiatry*. Led by senior author Dr. Kerry Ressler of Emory University in Georgia and Harvard Medical School and McLean Hospital in Massachusetts, the study reports an association between the activity of two key brain regions involved in emotional regulation, the amygdala and anterior cingulate cortex (ACC), shortly after trauma and symptoms of PTSD that emerged within the following year.

“This study introduces a new potential biomarker of PTSD, highlighting new roles for neuroimaging in PTSD research,” said Dr. John Krystal, Editor of *Biological Psychiatry*. The identification of a PTSD biomarker has exciting implications for limiting or preventing symptoms of the disorder.

“The search for such early biological markers of poor recovery is very important, because it will allow us to find the people who are most at risk right after a trauma, and intervene early, before the onset of disorders such as PTSD or depression,” said first author Dr. Jennifer Stevens, of Emory University.

In the study, Stevens and colleagues used functional magnetic resonance imaging to measure brain activity of 31 people approximately one month after a traumatic incident. The trauma was non-military related and included events such as a car accident or sexual assault. While the participants observed images of fearful faces (an index of threat), the researchers measured how the neural activity reacted in the amygdala and ACC, a brain region that regulates amygdala function, and how the activity changed over time with repeated viewing. Self-reported PTSD symptoms were assessed at 1, 3, 6, and 12 months after trauma.

People with a greater amygdala response to fearful faces had greater initial symptom severity, and were more likely to maintain PTSD symptoms over the following year. Additionally, those with a sharper drop in ventral ACC activity over repeated viewing of fearful images, called habituation, showed a poorer recovery trajectory. The findings suggest that amygdala reactivity and ventral ACC habituation to a threat predict the emergence of PTSD symptoms after trauma.

“The findings also suggest that an over-active amygdala may be one of the causes of PTSD, and that we should try to develop treatments that reduce amygdala reactivity,” said Stevens. For example, the region could be targeted with interventions such as psychotherapy or pharmacological treatments that can be administered shortly after trauma occurs.

Notes for editors

The article is "Amygdala Reactivity and Anterior Cingulate Habituation Predict Posttraumatic Stress Disorder Symptom Maintenance After Acute Civilian Trauma," by Jennifer S. Stevens, Ye Ji Kim, Isaac R. Galatzer-Levy, Renuka Reddy, Timothy D. Ely, Charles B. Nemeroff, Lauren A. Hudak, Tanja Jovanovic, Barbara O. Rothbaum, and Kerry J. Ressler (<http://dx.doi.org/10.1016/j.biopsych.2016.11.015>). It appears in *Biological Psychiatry*, volume 81, issue 12 (June 2017), published by [Elsevier](#).

Copies of this paper are available to credentialed journalists upon request; please contact Rhiannon Bugno at Biol.Psych@UTSouthwestern.edu or +1 214 648 0880. Journalists wishing to interview the authors may contact Jennifer S. Stevens, Ph.D., at jennifer.stevens@emory.edu.

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

John H. Krystal, M.D., is Chairman of the Department of Psychiatry at the Yale University School of Medicine, Chief of Psychiatry at Yale-New Haven Hospital, and a research psychiatrist at the VA Connecticut Healthcare System. His disclosures of financial and conflicts of interests are available [here](#).

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