

Study reveals areas of the brain impacted by PTSD

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Regions of the brain associated with stress and posttraumatic stress disorder.
Credit: National Institutes of Health

Researchers at Boston University School of Medicine (BUSM) and the VA Boston Healthcare System are one step closer to understanding the specific nature of brain changes associated with Posttraumatic Stress Disorder (PTSD).

The findings, which appear in the journal *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging*, may lead to better diagnosis and treatment of the condition.

PTSD is a psychiatric disorder that follows a traumatic event and is characterized by flash-backs (or re-experiencing trauma), avoidance of thoughts/feelings associated with the trauma and hyperarousal or hypervigilance. For some time it has been known that individuals who suffer from PTSD have abnormalities in the structure and function of the brain, but more recently, it has become clear that PTSD is also associated with changes in how regions of the brain communicate with each other. In particular, PTSD has been associated with disruptions in the communication of a network of brain regions that are involved in internally directed forms of mental activity, such as during spontaneous thought.

Guided by evidence that this network can be subdivided into distinct parts that have specialized functions, Danielle R. Miller, PhD, and her colleagues studied the communication within this network of brain regions in more detail. Sixty-nine returning war Veterans with PTSD and 44 Veterans with a history of trauma but without PTSD underwent functional Magnetic Resonance Imaging (fMRI) of the brain to measure brain activity through blood flow.

The researchers found that in Veterans with PTSD, disruptions of the aforementioned network affected specifically the communication between brain regions involved in memory.

Furthermore, they found that the less these brain regions communicated with each other, the more individuals with PTSD exhibited avoidance symptoms, such as avoiding trauma-related thoughts or feelings, avoiding reminders of the trauma, avoiding trauma-evoking situations, or an inability to recall certain aspects of the trauma.

"This study highlights that disruptions in the communication between [brain regions](#) involved in memory may be an important mechanism in PTSD. Although this study was not a treatment study, our research suggests that treatments targeted at enhancing this communication may improve PTSD symptoms," explained Miller.

Miller believes that any step toward identifying mechanisms contributing to PTSD is important and crucial toward improved care for individuals suffering from the disorder.

Provided by Boston University Medical Center

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