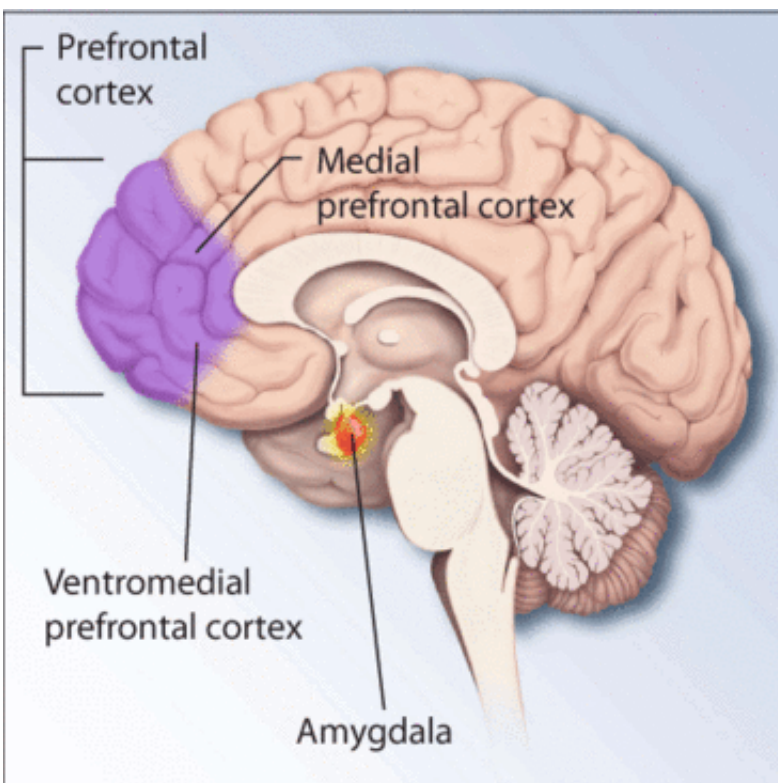


Posttraumatic stress disorder reveals imbalance between signalling systems in the brain

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

Experiencing a traumatic event can cause life-long anxiety problems, called posttraumatic stress disorder. Researchers from Uppsala University and Karolinska Institutet now show that people with

posttraumatic stress disorder have an imbalance between two neurochemical systems in the brain, serotonin and substance P. The greater the imbalance, the more serious the symptoms patients have.

Many people experience traumatic events in life, e.g. robbery, warfare, a serious accident or sexual assault. Approximately 10 percent of people subjected to trauma suffer long-lasting symptoms in the form of disturbing flashbacks, insomnia, hyperarousal and anxiety. If these problems lead to impairment, the person is said to suffer from [posttraumatic stress disorder](#), PTSD.

It has previously been shown that people with PTSD have altered brain anatomy and function. A new study by researchers from the Department of Psychology at Uppsala University and Clinical Neuroscience at Karolinska Institutet shows that people with PTSD have an imbalance between two neurochemical signalling systems of the brain, serotonin and substance P. Professors Mats Fredrikson and Tomas Furmark led the study using a so-called PET scanner to measure the relationship between these systems.

The study, which has been published in the renowned scientific journal *Molecular Psychiatry*, shows that it is the imbalance between the two signalling systems which determines the severity of the symptoms suffered by the individual rather than the degree of change in a single system. Others have previously speculated that the biological basis of psychiatric disorders such as PTSD includes a shift in the balance between different signalling systems in the brain but none has yet proved it. The results of the study are a great leap forward in our understanding of PTSD. It will contribute new knowledge which can be used to design improved treatments for traumatised individuals.

"At present, PTSD is often treated with selective serotonin re-uptake inhibitors (SSRIs) which have a direct effect on the serotonin system.

SSRI drugs provide relief for many but do not help everybody. Restoring the balance between the [serotonin](#) and substance P systems could become a new treatment strategy for individuals suffering from traumatic incidents," says lead author Andreas Frick, researcher at the Department of Psychology, Uppsala University.

More information: Frick et al. (2015): Overlapping expression of serotonin transporters and neurokinin-1 receptors in posttraumatic stress disorder: a multi-tracer PET study, *Molecular Psychiatry*.

Provided by Uppsala University

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