

Oxytocin helps to better overcome fear

November 13 2014

Frightening experiences do not quickly fade from memory. A team of researchers under the guidance of the University of Bonn Hospital has now been able to demonstrate in a study that the bonding hormone oxytocin inhibits the fear center in the brain and allows fear stimuli to subside more easily. This basic research could also usher in a new era in the treatment of anxiety disorders. The study has already appeared in advance online in the journal *Biological Psychiatry*. The print edition will be available in a few weeks.

Significant [fear](#) becomes deeply entrenched in memory. Following a car accident, for example, it is difficult to manage street traffic once again - even screeching tires can evoke significant anxiety. Scientists refer to this as "conditioning". Certain images or noises are very closely intertwined in the brain with the experience of pain or fear. Only gradually does one learn that not every screeching tire means danger. This active overwriting in the memory is known as "extinction". "In this process, however, the original contents of the memory are not erased but instead merely overlaid with positive experiences," explains Prof. Dr. Dr. René Hurlmann from the Department of Psychiatry and Psychotherapy of the University of Bonn Hospital. If there are dangerous situations once again, the fear, which was believed to have been already overcome, frequently flares up once more.

Extinction is often used in therapy for [anxiety disorders](#). For example, a person suffering from a spider phobia will gradually and increasingly come face to face with spiders. First the patient has to view photos of spiders and then look at living examples until finally he holds a tarantula

in his hand. When people with an anxiety disorder experience as frequently as possible the fact that they do not need to fear the trigger, their fear is reduced. "However, this can take a very long time, because this confrontation with the fearful situation frequently has to be experienced. In addition, there may be relapses because the original trace of fear is still anchored in the memory," reports Prof. Hurlemann. This is why therapists seek a possibility for "overwriting" the fearful memory in a faster and longer-lasting way.

Oxytocin facilitates overwriting of fearful experiences

It has been known for a long time that the [hormone oxytocin](#) does not just have a bonding effect in the mother-child relationship and in the case of sex partners but that it is also considered to be anxiolytic. The scientists at the Department of Psychiatry and Psychotherapy at the University of Bonn, together with their colleagues from the German Cancer Research Center in Heidelberg and the University of Chengdu (China) have now been able to prove its helpful effect in overwriting fearful experiences. "Oxytocin actually reinforces extinction: Under its influence, the expectation of recurrent fear subsequently abates to a greater extent than without this messenger," says study director Prof. Hurlemann, summarizing the result.

The team of scientists induced [fear conditioning](#) in a total of 62 healthy male subjects. In the brain scanner, using video glasses, the [test subjects](#) viewed photos, for example of human faces. For 70 percent of the images, they received a very brief, unpleasant electrical shock to the hand via electrodes. "In this way, certain images were associated with an experience of anxiety in the test subjects' memory," explains Prof. Hurlemann. The scientists used two methods to prove that this pairing of a particular photo and pain was actually anchored in the test subjects' brains: The expectation of an electrical shock was demonstrated by increased cold sweat which was measured via skin conductivity. In

addition, the brain scans prove that the fear regions in the brain were always particularly active.

Half of the test subjects received oxytocin via a nasal spray. The rest received a placebo. Then the extinction phase began in which the test persons were shown the same pictures several times as before but they no longer received electrical shocks. In the men under the influence of oxytocin, the amygdala, as the fear center in the brain, was overall far less active than in the control group, whereas fear-inhibiting regions were more stimulated. Over time, the messenger caused the fear to initially be somewhat greater but then it abated to a far greater extent than without oxytocin. The scientists explain this through the special effect of the messenger: "Oxytocin initially reinforces the test subjects' conscious impressions and thus the reaction to the [electrical shock](#), yet after a few minutes, the anxiolytic effect prevails," explains Prof. Hurlemann.

The scientists hope that anxiety patients can be helped more quickly with the aid of oxytocin and that a relapse can be better prevented. In addition, the researchers presume that the hormone likely facilitates bonding between the therapist and the patient and thus the success of the treatment. "However, this must first be demonstrated by clinical studies," says the scientist from the University of Bonn Hospital.

More information: Oxytocin Facilitates the Extinction of Conditioned Fear in Humans, *Biological Psychiatry*, [DOI: 10.1016/j.biopsych.2014.10.015](#)

Provided by University of Bonn

Citation: Oxytocin helps to better overcome fear (2014, November 13) retrieved 2 May 2024

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