Drug reduces the increase in fear caused by previous traumatic experiences in mice

January 12 2011

Living a traumatic experience favours the persistence of fear associated with an aversive stimulus, known as fear conditioning and such effect, in mice, can be suppressed with a single dosis of 7,8-Dihydroxyflavone, a type of flavonoid which boosts the ability to acquire new emotional learnings. The researchers consider that the drug could be used in the effective treatment of post-traumatic stress, panic and phobia disorders in persons.

Mice previously exposed to traumatic situations demonstrate a more persistent memory of fear conditioning - acquired by associating an acoustic stimulus with an aversive stimulus - and lack the ability to inhibit this fear. This phenomenon is similar to that of people who suffer from Post-Traumatic Stress Disorder (PTSD), an anxiety disorder which appears after being exposed to highly traumatic situations, such as a violent attack, a natural disaster or physical abuse.

In the study Spanish researchers verified that the 7,8-Dihydroxyflavone injected into mice previously subjected to a traumatic experience made them extinguish fear conditioning quicker. The enhancement of this new learning is the result of 7,8-Dihydroxyflavone activating the TrkB receptors in the brain, probably those found in the amygdala, which are essential for emotional learning and memory.

7,8-dihydroxyflavone is a type of flavonoid. These chemical compounds are present in our diets in elements such as red wine, citrus, cereals, tea and chocolate (at least 70% cocoa), etc. Chronic administration of foods

rich in flavonoids in lab animals has demonstrated neuroprotective effects in aged rodents, but the activation of TrkB receptors produced by these foods is surely low compared to the effects of 7,8-Dihydroxyflavone.

TrkB receptors in the brain are activated in mammals by the BDNF protein. There are different pathologies, such as depression or anxiety disorders, in which this protein shows alterations in its function. Unfortunately, administration of the BDNF protein as a drug is limited given that a large part of the amount injected does not permeate the blood-brain barrier and cannot access the brain. Very recent studies have demonstrated that 7,8-Dihydroxyflavone is the first drug to imitate BDNF actions and enter the brain with much more efficacy than the protein, thus revealing therapeutic actions in animal models suffering from Alzheimer's, strokes, Parkinson's and/or depression.

The results obtained in this study postulate that 7,8-Dihydroxyflavone as a drug could be an useful treatment for disorders based on fear such as PTSD, panic attacks and phobias. Researchers consider it convenient to study its effects combined with psychotherapy, administering the drug in fear extinction therapy sessions for anxiety disorders or even shortly after a person experiences a traumatic situation.

More information: Effect of 7,8-Dihydroxyflavone, a Small-Molecule TrkB Agonist, on Emotional Learning. Raul Andero, Scott A. Heldt, Keqiang Ye, Xia Liu, Antonio Armario, Kerry J. Ressler. *American Journal of Psychiatry*. December, 2010. doi:10.1176/appi.ajp.2010.10030326

Provided by Universitat Autonoma de Barcelona