

Study: Long-Term Stress Significantly Impacts Short-Term Memory

Research results on the first study to link long-term stress with short-term memory outcomes was recently released to the public. Sustained stress levels play a heavy role in memory challenges as well as immune system function. The Ohio State University's work was released in the *Journal of Neuroscience*.

The Intruder

Two groups of mice were trained to learn where an "escape hole" was in their environment. Then, the two groups were provided different situations over a period of time. Group one were allowed time in their natural habitat, and they always remembered where to exit via the escape hole when desirable. Group two were introduced to an intruder mouse with a very bad reputation, to say the least. The second group endured long-term stressors during this study.

The mice in group two which previously mastered knowing where the escape hole now was unable to recall the location of the needed escape. The mental anguish of the second group is much like consistent bullying over a period of time. It is also comparable to post-traumatic stress syndromes.

Measurable Changes

Measurable changes occurred in the brains of the second group of mice. When studying the physical aspects of the brains, inflammation was found with the presence of immune cells known as macrophages. The ongoing stress directly created a systemic response to inflammation. This, in turn, created short-term memory loss, and it also affected the immune system of the

mice.

The Hippocampi

The hippocampi is the part of the brain that focuses on short term memory, long term memory, and spatial triangulation. This research study focused on changes in this area of the brain that is the “hub” of memory as well as emotional responses.

The stressed group of mice continued to have challenges with spatial memory for close to thirty days. These mice also showed strong signs of avoidance socially which is much like depression; this continued for nearly four weeks during the monitoring phase.

Another interesting finding of this research study is the lack in development of new neurons in the brain. Deficits were detected at the ten-day mark and the 28-day mark after the period of intense stress phase.

Inhibiting Inflammation

In order to inhibit inflammation, the mice were given a chemical to decrease the inflammatory response. The memory loss went away along with the inflammatory macrophages. Unfortunately, the symptoms of depression *did not* go away, and the *negative* brain cell changes remained.

The Next Step

Additional studies have been published which link chronic stress to the body’s anxiety response. According to the researchers at The Ohio State University, it is possible to pinpoint specific targets in the response which can be treated in the future with behavior therapy, and/or pharmacology. More specifically, researchers are interested in interrupting the inflammation process that occurs.

The Results

The Ohio State study concluded continued stress is directly linked to inflammation and immune system response. This opens to the doors to a whole new world of therapy based on the immune system's response to stress.

Uncovering the Secrets

Uncovering the secrets to understanding stress more fully and providing long-range changes to help individuals cope with ongoing stress is very important. Ongoing stress can be related to individuals in bad marriages who continue to stay, employees working for overbearing bosses for long periods of time, and other ongoing traumatic situations. Individuals in armed forces who deal with enduring stress also need increasing ways of coping in a healthy manner to live beyond those times of critical levels of stress.

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