

Study links inflammation in brain to some memory decline

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High levels of a protein associated with chronic, low-grade inflammation in the brain correlate with aspects of memory decline in otherwise cognitively normal older adults, according to a study led by scientists at the University of California, San Francisco.

The study is being reported in a poster session at the American Academy of Neurology annual meeting on Wednesday, April 13, 2011.

Inflammation is part of the body's natural immune response to tissue damage. However, [chronic inflammation](#) is associated with many diseases. In the [brain](#), it is thought to play a role in aging and [neurodegenerative diseases](#), such as Parkinson's and Alzheimer's. If further research determines that inflammation causes [memory decline](#), anti-inflammatory drugs could prove useful in staving off the damage.

Studies in animals have shown that prolonged brain inflammation impairs function of the [hippocampus](#), a region of the brain involved in storing and generating memory. It does so by disrupting the establishment of memories, a process known as long term potentiation.

The scientists in the study hypothesized that the presence of C-reactive protein (CRP), a marker of chronic low grade inflammation in the brain, would be associated with poorer memory creation and smaller medial-temporal lobes, which include the hippocampus.

They examined 76 women and men (mean age 71.8) with detectable

levels of CRP in their blood, and 65 people (mean age 70.8) with undetectable levels. All participants were given a 16-word list learning task to measure verbal recall, and underwent [magnetic resonance imaging](#), MRI, to measure volumes of regions of the medial temporal lobes, specifically the hippocampus, entorhinal cortex and parahippocampal cortex.

The results showed that adults with measureable levels of C reactive protein recalled fewer words and had smaller medial temporal lobes.

Scientists don't know if the inflammation indicated by the C reactive protein is the cause of the memory loss, if it reflects a response to some other disease process or if the two factors are unrelated. But if inflammation causes the cognitive decline, relatively simple treatments could help, said Joel H. Kramer, PsyD, UCSF clinical professor of neuropsychology and the director of the neuropsychology program at the UCSF Memory and Aging Center.

"Anti-inflammatory drugs available today could be used to treat low grade infections in the brain, and could be used more aggressively following surgery, which prompts a large inflammatory response," he said.

Kramer and his colleagues plan to monitor the participants until the end of their lives and to use additional inflammatory markers – ones that tend to be more sensitive to acute changes than CRP.

"We think such a study will give us a better idea of what's driving the processes we've observed," he said. "If baseline levels of inflammatory markers predict change over time, we'd consider a clinical trial using anti-inflammatory drugs to treat inflammation."

Inflammation is just one of several possible factors that might be driving

cognitive decline in normally aging adults, said Kramer. He and his colleagues are examining the possible impact of cardiovascular and stroke risk factors, as well. "We're also just starting to look at exercise, and want to study sleep," he said.

Provided by University of California, San Francisco

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