Medical Xpress

Chronic inflammation in middle age may lead to thinking and memory problems later

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People who have chronic inflammation in middle-age may develop problems with thinking and memory in the decades leading up to old age, according to a new study published in the February 13, 2019, online issue of *Neurology*, the medical journal of the American Academy of Neurology.

There are two kinds of inflammation. Acute inflammation happens when the body's immune response jumps into action to fight off infection or an injury. It is localized, short-term and part of a healthy immune system. Chronic inflammation is not considered healthy. It is a low-grade inflammation that lingers for months or even years throughout the body. It can be caused by autoimmune disorders like rheumatoid arthritis or multiple sclerosis, physical stress or other causes. Symptoms of chronic inflammation include joint pain or stiffness, digestive problems and fatigue.

Ways to reduce chronic inflammation include getting regular exercise, following an anti-inflammatory heart healthy diet, and getting enough sleep.

"Chronic inflammation is tough on the body, and can damage joints, internal organs, tissue and cells," said study author Keenan A. Walker, Ph.D., of Johns Hopkins University in Baltimore, Md. "It can also lead to heart disease, stroke and cancer. While other studies have looked at chronic inflammation and its effects on the brain in older people, our large study investigated chronic inflammation beginning in middle age and showed that it may contribute to cognitive decline in the decades leading up to old age."

As part of the Atherosclerosis Risk in Communities (ARIC) Study, researchers followed 12,336 people with an average age of 57 for approximately 20 years. Researchers took blood samples from participants at the start of the study, measuring four biomarkers of inflammation: fibrinogen, white blood cell count, von Willebrand factor, and factor VIII. They created a composite inflammation score for the four biomarkers. Three years later, researchers measured C-reactive protein, another blood biomarker of inflammation. Participants were divided into four groups based on their composite inflammation scores and C-reactive protein levels.

Participants' thinking and memory skills were tested at the beginning of the study, six to nine years later, and at the end of the study.

Researchers found the group with the highest levels of inflammation biomarkers had an 8-percent steeper decline in thinking and memory skills over the course of the study than the group with the lowest levels of inflammation biomarkers. The group with the highest C-reactive protein levels had a 12-percent steeper decline in thinking and memory skills than the group with the lowest levels. These results were derived after researchers adjusted for other factors that could affect thinking and memory skills, such as education, heart disease and high blood pressure. Further analyses revealed that inflammation-associated declines in thinking were most prominent in areas of memory, compared to other aspects of thinking such as language and executive functioning.

"Overall, the additional change in thinking and memory skills associated with chronic inflammation was modest, but it was greater than what has been seen previously associated with high blood pressure in middle age," Walker said.

"Many of the processes that can lead to a decline in thinking and memory skills are believed to begin in middle age, and it is in middle age that they may also be most responsive to intervention," said Walker. "Our results show that chronic inflammation may be an important target for intervention. However, it's also possible that chronic inflammation is not a cause and instead a marker of, or even a response to, neurodegenerative brain diseases that can lead to cognitive decline."

A limitation of the study was that participants with higher levels of chronic inflammation at the start of the study were more likely to drop out or die before the final follow-up visit, so surviving participants may not be representative of the general population.

Future studies could include more frequent assessments of thinking and memory skills. They could also examine a larger variety of inflammation markers in the blood.

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