

# Inflammation in midlife linked to brain shrinkage later

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People who show signs of inflammation in middle age are more likely to suffer from brain shrinkage later in life, a possible precursor to dementia or Alzheimer's disease, researchers said Wednesday.

The findings in the journal *Neurology* are the latest to uncover an association between dementia and inflammation, in which the body's immune cells rev up in response to harms like smoking, stress, illness or poor diet.

However, the findings stopped short of proving any cause-and-effect relationship.

"These results suggest that inflammation in mid-life may be an early contributor to the brain changes that are associated with Alzheimer's disease and other forms of dementia," said study author Keenan Walker of the Johns Hopkins University School of Medicine.

"Because the processes that lead to brain cell loss begin decades before people start showing any symptoms, it is vital that we figure out how these

processes that happen in middle age affect people many years later."

The study was based on 1,633 people with an average age of 53.

Researchers tested their blood for levels of five markers of inflammation—not in any specific part of the body but rather throughout it—including the white blood cell count.

An average of 24 years later, participants took a memory test and underwent brain scans.

Those who had higher levels of inflammation at midlife on three or more biomarkers had an average five percent lower brain volume in the hippocampus and other areas associated with Alzheimer's disease, said the report.

The effect was similar to having one copy of a gene—called apolipoprotein E (APOE) e4—that predisposes people to Alzheimer's, researchers said.

People with higher inflammation also performed slightly worse on a memory test, remembering on average five of 10 words they were asked to recall, compared to 5.5 in the non-inflammation group.

## Need to 'clarify' role

Outside experts described the study as large and rigorously conducted, but stressed that it did not study whether patients went on to develop Alzheimer's disease, only that some showed signs of brain shrinkage and memory loss.

"This research points to inflammation as a potential early indicator of later brain degeneration, but we cannot say whether inflammation could be causing brain shrinkage or if it is a response to other damaging processes that might already be underway," said Carol Routledge, director of

Research at Alzheimer's Research UK.

"The researchers measured levels of inflammation at a single point in time and we don't know whether this gives a reliable indication of inflammation more generally," she added.

Doug Brown, director of research and development at the Alzheimer's Society, said the findings are in line with a growing body of research that points to inflammation and problems with the immune system playing a role in the development of dementia.

"Although these results are a helpful addition to the wider body of research around brain health and inflammation, what we need is more research to further clarify this relationship," he said.

"While the study may not conclusively show that brain shrinkage is due to inflammation, it does highlight the importance of taking care of your cognitive health throughout your life, particularly in middle age," he added.

"This includes eating a healthy balanced diet, taking regular exercise and managing conditions like diabetes and high blood pressure."

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