

Silent vascular disease accompanies cognitive decline in healthy aging

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Older people who are leading active, healthy lifestyles often have silent vascular disease that can be seen on brain scans that affect their ability to think, according to a new study led by UC Davis researchers and published online today in the *Archives of Neurology*.

"This study shows that silent vascular disease is really common as we get older and it influences our thinking abilities," said Charles DeCarli, professor of neurology in the School of Medicine at UC Davis and director of the UC Davis Alzheimer's Disease Center. "We're beginning to realize that vascular disease plays a major role in Alzheimer's disease — they go together."

The study findings are based on data from participants in the Alzheimer's Disease Neuroimaging Initiative. The initiative tracks individuals who are normal, those who have [mild cognitive impairment](#) (MCI) and people with Alzheimer's disease using magnetic resonance imaging (MRI), positron emission tomography (PET) imaging and laboratory and cognitive testing to track changes in their cognitive status.

Over 5 million elderly people in the United States have Alzheimer's disease, a progressive, incurable and terminal disease and the most common form of age-related dementia. In its 2009 World Alzheimer Report, Alzheimer's Disease International found that there are more than 35 million people worldwide with Alzheimer's disease or other types of dementia. It also projected that the number should nearly double in the next 20 years.

Cardiovascular disease, including hypertension, high cholesterol and atherosclerosis, is also common in the elderly, and causes "[white matter hyperintensities](#)," regions of damaged brain tissue that look like white-hot areas on MRI scans. The purpose of the study was to better understand the relationship between white matter hyperintensities and the extent to which they precede, coincide with or follow short-term changes in cognitive functioning.

For the study, more than 800 participants ages 55 to 90 were recruited from more than 50 research sites throughout the United States and Canada. Some 200 participants were cognitively normal individuals who were followed for three years. Approximately 400 people with mild cognitive impairment also were followed for three years. Two hundred people with Alzheimer's disease were followed for two years. Potential participants with serious brain anomalies, such as brain tumors or prior surgery, were excluded from the study.

All of the participants' baseline cognitive functioning was established using clinical diagnostic evaluation, including the Mini Mental State Exam and the Alzheimer's Disease Assessment Scale-Cognitive Subscale. Criteria for the normal group included no evidence of depression, mild cognitive impairment or dementia. Individuals were included in the MCI category if they had a subjective memory complaint or objective memory loss, among other measures. Participants with Alzheimer's disease met nationally accepted criteria for probable Alzheimer's disease.

Participants whose white matter hyperintensities were significantly above average at the beginning of the study lost more points each year in cognitive testing than those whose white matter hyperintensities were average at baseline. Those with mild cognitive impairment or Alzheimer's disease at baseline had additional declines on their cognitive testing each year, meaning that the presence of white matter

hyperintensities and MCI or Alzheimer's disease together added up to even faster and steeper cognitive decline. In addition, participants who were older at baseline saw faster declines over time in their Mini Mental State Exam scores.

The researchers found that, at the outset of the study, the extent of white matter hyperintensities was associated with greater subsequent declines in global cognition over a one-year period.

"In a sample ... with frequent evaluations, short-term follow-up and a relatively mild profile of cardiovascular risk, white matter disease may be an important predictor of subsequent short-term global cognitive change," the study found.

"There's a big group of people who have not had major cardiovascular events such as heart attacks. But we see signs that even milder vascular-related insults can contribute to loss of cognitive functioning," said Owen Carmichael, the study's lead author and an assistant professor in the Department of Neurology in the School of Medicine at UC Davis.

Carmichael said that the study suggests that reducing your cardiovascular risk factors to a moderate level may not be enough to avert all forms of brain disease that can lead to cognitive decline in aging.

"Every little bit counts — you have got to squeeze every little bit of healthy lifestyle out of your day" to avoid brain aging, he said.

Provided by University of California - Davis

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