

# Study links heart disease risk factors to some cognitive decline

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Older adults at risk for stroke have significantly increased risk for some types of cognitive decline, according to a multicenter study led by University of California scientists.

The study, which involved 73 older women and men who had not had a stroke and did not have dementia, showed that participants had substantially greater risk for decline in some aspects of "executive function" – specifically in verbal fluency and the ability to ignore irrelevant information. Verbal memory and short term, or "working memory," were not affected.

The finding is reported in a poster session at the American Academy of Neurology annual meeting on Tuesday, April 12, 2011.

Elevated risk factors for coronary artery disease previously have been linked to a decline in cognitive function in non-demented older adults. However, few studies have examined specific aspects of neuropsychological functioning in individuals with a wide range of risk for coronary artery disease and stroke.

The goal of the current study was see if risk for these conditions was associated with declines in specific neuropsychological functions. The team asked the question, 'if a study controlled for age, education and gender, would the risk for coronary artery disease be associated with a decline in executive function or memory?'

They assessed participants' risk for coronary artery disease using the widely used Framingham Coronary Risk Score, which incorporates [coronary artery disease](#) risk factors – age, cholesterol levels, blood pressure, presence of diabetes, and smoking status – to generate a person's risk of stroke within 10 years.

The participants underwent testing for executive function – the ability to engage in goal-directed behavior, such as remaining attentive, multitasking, thinking flexibly, inhibiting attention to irrelevant sensory information and generating ideas – and memory, through a series of neuropsychological tests.

The results showed that those at a higher risk for stroke performed worse on verbal fluency, a test designed to measure a person's ability to quickly generate verbal information. It also showed that higher risk for stroke, as well as age, accounted for a significant portion of decline in the ability to ignore irrelevant information.

"The findings reveal that if you control for age, education and gender, participants with higher risk for stroke perform significantly more poorly in verbal fluency and in inhibition, even when controlling for a history of stroke and [dementia](#)," said the lead author of the study, Jonathan Gooblar, a research associate in the UCSF Memory and Aging Center.

At the same time, the research "suggests that treating stroke risk factors potentially could decrease decline in executive function in otherwise healthy patients," said the senior author of the study, Joel H. Kramer, PsyD, UCSF clinical professor of neuropsychology and the director of the neuropsychology program at the UCSF Memory and Aging Center.

The study involved women and men with a mean age of 78 who live independently. They were recruited as part of the ongoing "Aging Brain:

Vasculature, Ischemia and Behavior" study involving researchers at UCSF, University of Southern California and University of California, Davis. The principle investigator of the NIH-funded study is Helena Chiu, MD, of USC.

The study also looked at the cohort in a different way - by dividing the participants up into high and low risk groups according to a cutoff widely used (15 percent risk of [stroke](#) in 10 years for women and 20 percent for men). "We showed that this common method of dividing up populations didn't detect cognitive impairment as well as treating risk as a continuous factor," said Gooblar. "Even people with a 'lower' risk score according to that dichotomy (12 percent for example) were more likely to have cognitive impairment than lower risk scores."

Kramer said he suspects that coronary risk factors cause cerebrovascular damage that will be detected in neuroimaging scans and will correlate with [cognitive decline](#). The team has conducted scans, but has not yet analyzed the data for this particular study.

Looking ahead, he said, the team plans to focus on participants who have elevated heart risk factors, in order to identify the mechanisms of cognitive change. "Within that group, there probably will be some who have early Alzheimer's disease and some who don't. We want to understand the relationship between vascular risk factors and Alzheimer's disease, as well as the relationship between vascular risk factors and cognitive change that's purely associated with vascular changes in the brain resulting from heart disease risk factors."

Provided by University of California, San Francisco

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