

# Lower biomarker levels, less education associated with greater cognitive decline

January 18 2011

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Older adults without dementia and with lower levels in plasma of the biomarkers beta-amyloid 42/40 (protein fragments) had an increased rate of cognitive decline over a period of 9 years, according to a study in the January 19 issue of *JAMA*. The researchers also found that this relationship was stronger among individuals with less education and lower levels of literacy.

An estimated 36 million people currently have dementia, with the prevalence expected to double every 20 years, according to background information in the article. "Thus, biomarkers to identify elderly persons at risk of developing dementia could be useful for early prevention, if and when such interventions are available, and treatment," the authors write. "Lower plasma beta-amyloid 42 and 42/40 levels have been associated with incident dementia, but results are conflicting and few have investigated cognitive decline among elders without dementia."

Kristine Yaffe, M.D., of the University of California, San Francisco, and San Francisco Veterans Affairs Medical Center, and colleagues conducted a study to investigate the association between plasma beta-amyloid 42 and 42/40 levels and cognitive decline in a large group of community-dwelling older adults without dementia, and also examined whether measures of cognitive reserve, as indicated by levels of education and literacy attained, modified the association of plasma beta-amyloid level with cognitive decline. The analysis included 997 black and white community-dwelling older adults who were enrolled in the Health ABC Study, a prospective observational study begun in

1997-1998 with 10-year follow-up in 2006-2007. Participant average age was 74 years; 55.2 percent (n = 550) were female; and 54 percent (n = 538) were black. Measures of beta-amyloid 42 and 42/40 and cognitive function (via Modified Mini-Mental State Examination) were obtained.

The researchers found that low beta-amyloid 42/40 level was associated with greater cognitive decline over 9 years. After adjustment for several factors, the results remained statistically significant. There was also a significant association between plasma beta-amyloid 42 levels and cognitive decline. There was no association between plasma beta-amyloid 40 levels and baseline cognitive function or decline.

Also, cognitive reserve measures modified the association between beta-amyloid 42/40 level and cognitive decline. [Older adults](#) with low reserve (as measured by less than a high school diploma or sixth-grade or lower literacy) had an even greater association with beta-amyloid 42/40 level, whereas those with high reserve had less association.

"These results are important, as the prevalence of cognitive impairment is increasing exponentially and prevention will be crucial. To identify those at risk of [dementia](#), biomarkers like plasma beta-amyloid level that are relatively easy to obtain and minimally invasive could be useful. In addition, our finding of an interaction of cognitive reserve with the association of plasma beta-amyloid level and [cognitive decline](#) could have public health importance because it may suggest pathways for modifying beta-amyloid effects on cognition," such as with cognitive activity or ongoing education, the authors write.

"Future studies should further explore the use of plasma beta-amyloid as a biomarker, assess the mechanisms by which cognitive reserve modifies this association, and determine whether increasing cognitive reserve through interventions can reduce the risk of Alzheimer disease."

**More information:** JAMA. 2011;305[3]:261-266.

Provided by JAMA and Archives Journals

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