New biomarker may help with early diagnosis of Alzheimer's disease

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A new biomarker may help identify which people with mild memory deficits will go on to develop Alzheimer's disease, according to a new study published in the June 22, 2011, online issue of *Neurology*, the medical journal of the American Academy of Neurology. The biomarker may be more accurate than the currently established biomarkers.

"Being able to identify who will develop Alzheimer's disease very early in the process will be crucial in the future," said study author Robert Perneczky, MD, of the Technical University Munich in Germany. "Once we have treatments that could prevent Alzheimer's disease, we could begin to treat very early and hopefully prevent the loss of memory and thinking skills that occurs with this devastating disease."

The study involved 58 people with slight memory problems, or mild cognitive impairment (MCI). Up to 15 percent of people with mild cognitive impairment develop Alzheimer's disease each year.

A sample of cerebrospinal fluid of the participants was taken at the beginning of the study through a lumbar puncture, or spinal tap. The concentrations in the cerebrospinal fluid of several proteins that are associated with Alzheimer's disease were measured.

The participants were followed for nearly three years on average. At that point, 21 people had developed Alzheimer's disease, 27 still had mild cognitive impairment and eight people had reverted back to their normal cognitive health. Two people had developed frontotemporal dementia,

and their results were not included in the analysis.

Researchers found that the people who developed Alzheimer's disease had significantly higher levels of a protein called soluble amyloid precursor protein beta (sAPPβ) in their spinal fluid than those who did not develop Alzheimer's disease. Those who developed Alzheimer's disease had an average of 1,200 nanograms per milliliter, compared to 932 for those who did not develop the disease.

The researchers found that the best predictor of whether someone would develop Alzheimer's disease was a combination of sAPPβ, the tau protein (an established marker of brain cell damage) and the age of the individual. When these factors were combined, the results were roughly 80 percent accurate in predicting whether the disease would develop.

The protein amyloid beta1-42, or Aβ1-42, which has previously been considered a biomarker for Alzheimer's disease, was not a predictive factor in this study.

"These results suggest that sAPPβ as a biomarker may be useful and superior to the established marker Aβ1-42 in the early diagnosis of Alzheimer's disease," Perneczky said.

"One possible explanation is that Aβ1-42 measures events further downstream from the initial steps that lead to the production of the amyloid plaques that accumulate in the brains of people with Alzheimer's disease. sAPPβ is a measure of the first critical step in that process and may therefore provide more accurate information on the core pathological events."

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