Alzheimer's markers predict start of mental decline

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(Medical Xpress)—Scientists at Washington University School of Medicine in St. Louis have helped identify many of the biomarkers for Alzheimer's disease that could potentially predict which patients will develop the disorder later in life. Now, studying spinal fluid samples and health data from 201 research participants at the Charles F. and Joanne Knight Alzheimer's Disease Research Center, the researchers have shown the markers are accurate predictors of Alzheimer's years before symptoms develop.

"We wanted to see if one marker was better than the other in predicting which of our participants would get cognitive impairment and when they would get it," said Catherine Roe, PhD, research assistant professor of neurology. "We found no differences in the accuracy of the biomarkers."

The study, supported in part by the National Institute on Aging, appears in *Neurology*.

The researchers evaluated markers such as the buildup of amyloid plaques in the brain, newly visible thanks to an imaging agent developed in the last decade; levels of various proteins in the cerebrospinal fluid, such as the amyloid fragments that are the principal ingredient of brain plaques; and the ratios of one protein to another in the cerebrospinal fluid, such as different forms of the brain cell structural protein tau.

The markers were studied in volunteers whose ages ranged from 45 to

88. On average, the data available on [study participants](link) spanned four years, with the longest recorded over 7.5 years.

The researchers found that all of the markers were equally good at identifying subjects who were likely to develop cognitive problems and at predicting how soon they would become noticeably impaired.

Next, the scientists paired the biomarkers data with demographic information, testing to see if sex, age, race, education and other factors could improve their predictions.

"Sex, age and race all helped to predict who would develop cognitive impairment," Roe said. "Older participants, men and African Americans were more likely to become cognitively impaired than those who were younger, female and Caucasian."

Roe described the findings as providing more evidence that scientists can detect Alzheimer's disease years before memory loss and cognitive decline become apparent.

"We can better predict future cognitive impairment when we combine biomarkers with patient characteristics," she said. "Knowing how accurate biomarkers are is important if we are going to some day be able to treat Alzheimer's before symptoms and slow or prevent the disease."

Clinical trials are already underway at Washington University and elsewhere to determine if treatments prior to symptoms can prevent or delay inherited forms of Alzheimer's disease. Reliable biomarkers for Alzheimer's should one day make it possible to test the most successful treatments in the much more common sporadic forms of Alzheimer's.

  More information: Roe, C., et al. Amyloid imaging and CSF biomarkers in predicting cognitive impairment up to 7.5 years later.

Provided by Washington University School of Medicine in St. Louis