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Imaging test detects Alzheimer's disease that is likely to progress

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Early Alzheimer's disease detected by a compound that binds to brain plaques appears likely to progress into symptomatic Alzheimer's disease with dementia, according to a report in the December issue of *Archives of Neurology*, one of the JAMA/Archives journals.

"The concept of preclinical Alzheimer's disease holds that the Alzheimer's pathologic process operates for many years before producing a clinically detectable impairment," the authors write as background information in the article. "A key corollary of this concept is that preclinical Alzheimer's disease is not benign and will eventually produce sufficient synaptic and neuronal damage to cause cognitive decline and other symptoms of Alzheimer's disease." Support for the existence of preclinical Alzheimer's disease comes from autopsies of cognitively normal older adults, many of whom have the brain plaques, tangles and deposits of a substance known as beta-amyloid that are characteristics of Alzheimer's disease.

Preclinical Alzheimer's disease can be detected by screening an individual's cerebrospinal fluid for biomarkers of the condition. In addition, imaging with positron emission tomography (PET) using a compound known as Pittsburgh Compound B (PiB), which binds to beta-amyloid, can detect deposits of the substance in living patients. John C. Morris, M.D., and colleagues at Washington University, St. Louis, assessed 159 older adults (average age 71.5) who had undergone PET scans using PiB and did not have symptoms of dementia. These patients were followed for between 0.8 and 5.5 years after having the scan and

underwent between two and six assessments for dementia during that timeframe.

A total of 23 participants progressed to clinically detectable dementia during follow-up, and nine were diagnosed with dementia of the Alzheimer type. These diagnoses were made by specialist clinicians who diagnosed the condition at an earlier stage than typically occurs and corroborated the diagnosis by declines in multiple cognitive domains as well as a loss of volume in certain areas of the brain.

The PiB imaging identified individuals who would develop Alzheimer's disease-related dementia—those in whom the compound bound to more beta-amyloid plaques were more likely to develop this condition. However, it did not predict which individuals would develop dementia not caused by Alzheimer's disease.

"Many more individuals, studied for longer intervals and ideally through autopsy, will be needed to confirm or refute our observations," the authors write. "Nonetheless, this study provides support for the premise that preclinical Alzheimer's disease, detected either by the cerebrospinal fluid signature for Alzheimer's disease or here by elevated PiB retention, predicts symptomatic Alzheimer's disease."

More information: Arch Neurol. 2009;66[12]:1469-1475.

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