

Genetic risk factors for Alzheimer's disease may be detectable even in young adults

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New research shows that a genetic risk score may detect those at higher risk for Alzheimer's disease long before symptoms appear—even possibly in healthy young adults, according to a study published in the

July 6, 2016, online issue of *Neurology*, the medical journal of the American Academy of Neurology.

"The stage of Alzheimer's before symptoms show up is thought to last over a decade," said Elizabeth C. Mormino, PhD, with Massachusetts General Hospital in Charlestown, Mass. "Given that current clinical trials are testing whether therapies can slow memory and thinking decline among people at risk for the disease, it is critical to understand the influence of risk factors before symptoms are present."

For the study, researchers calculated a polygenic [risk score](#), or a numeric score based on whether or not a person has several high-risk gene variants, in 166 people with dementia and 1,026 without dementia. Participants had an average age of 75. Scientists also looked for specific markers of Alzheimer's disease. The markers included memory and thinking decline, clinical progression of the disease and the volume of the hippocampus (the memory center of the brain).

Researchers also looked at links between the risk score and hippocampus volume in 1,322 healthy, younger participants between the ages of 18 and 35.

The study found that within older people free of dementia, a higher polygenic risk score was associated with worse memory and smaller hippocampus at the start of the study, accounting for 2.3 percent of the total variance in memory and 2.0 percent of the variance in hippocampus volume.

Over the three years of the study, a higher score was also linked to greater longitudinal [memory](#) and executive function decline and clinical progression of the disease. Finally, the risk score was associated with overall disease progression, with 15 of 194 participants that were cognitively normal at the start of the study developing mild cognitive

impairment or Alzheimer's disease, and 143 of 332 with [mild cognitive impairment](#) at the start of the study developing Alzheimer's disease after three years. Each standard deviation increase in polygenic risk was associated with a 1.6 times increase in risk of clinical progression.

Within the younger group, a higher risk score was tied to smaller hippocampus volume. For the younger group, the risk score accounted for 0.2 percent of the difference in hippocampus volume between those with high and low risk scores.

"Our study was small and larger numbers of participants will need to be studied to confirm our findings," said Mormino. "The goal of this type of research is to help physicians better identify those at high risk of dementia so that future preventative treatments may be used as early as possible."

Provided by American Academy of Neurology

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