

Signs of Alzheimer's disease may be present decades before diagnosis

August 11 2008

Scientists from the University of South Florida and the University of Kentucky report that people who develop Alzheimer's disease may show signs of this illness many decades earlier in life, including compromised educational achievement. Their research appears online this month in the journal *Alzheimer's Disease and Associated Disorders*.

Participants in the Nun Study were studied to identify those who became demented before death or had characteristic brain changes of Alzheimer's disease at autopsy. Among nuns who became demented or had evidence of Alzheimer's disease at autopsy, those with small head sizes had significantly lower educational achievement in earlier adult life. In those dying without a dementia diagnosis or autopsy evidence of Alzheimer's disease, head size had no relationship with education.

Adult head size can be used to estimate the size of the fully-developed brain. Previous studies have found that clinical expression of Alzheimer's disease is related to head size, with people having smaller heads more likely to show the characteristic symptoms of this illness. Larger brains provide reserve against Alzheimer's, allowing people to function normally despite having considerable Alzheimer pathology in their brains.

"If brain damage related to Alzheimer's disease begins earlier in adult life, then having less reserve due to a smaller brain could compromise intellectual ability in those destined to get Alzheimer's and lead to them getting less education," said lead author James Mortimer, PhD, Professor

of Epidemiology at USF. "Although it has been known for many years that individuals with lower education have a greater risk of getting Alzheimer's, this is the first report showing that reduced educational attainment may actually be an early sign of the underlying disease."

The study findings add to others showing that individuals who will eventually develop Alzheimer's differ from those who don't many decades before. In 1996, the Nun Study found that Alzheimer's disease with onset in old age could be predicted accurately from characteristics of autobiographical essays written at an average age of 22. Other studies have shown that those who develop Alzheimer's have specific deficits on tests of memory and thinking decades before the disease is diagnosed. The fact that subtle signs of Alzheimer's appear many years before symptoms appear may be useful for predicting who is at risk of the illness and identifying individuals earlier in life who could benefit from preventive therapies.

The Nun Study, begun in 1992, is a study of 678 Catholic sisters, initially 75 to 102 years of age, who were evaluated annually for dementia and who agreed to brain donation at the time of their deaths. The study is sponsored by the National Institute on Aging.

Source: University of South Florida

Citation: Signs of Alzheimer's disease may be present decades before diagnosis (2008, August 11) retrieved 26 April 2024 from <https://medicalxpress.com/news/2008-08-alzheimer-disease-decades-diagnosis.html>

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