Formal education lessens the impact of Alzheimer's disease

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Researchers at the Department of Psychiatry, Klinikum rechts der Isar, Technische Universität München, investigated the effects of formal education on the symptoms of Alzheimer's disease. They were able to show that education diminishes the impact of Alzheimer's disease on cognition even if a manifest brain volume loss has already occurred. The results are published in the current issue of the *Journal of Alzheimer's Disease*.

Dr. Robert Perneczky, Department of Psychiatry at Klinikum rechts der Isar explains: "We know that there is not always a close association between brain damage due to Alzheimer's disease and the resulting symptoms of dementia. In fact, there are individuals with severe brain pathology with almost no signs of dementia, whereas others with only minor brain lesions exhibit a considerable degree of clinical symptoms." These phenomena are often ascribed to the theoretical concept of cognitive reserve. A high level of cognitive reserve results in a strong individual resilience against symptoms of brain damage; cognitive reserve can therefore be seen as protective against brain damage.

In support of this, previous studies demonstrated that duration of formal education is associated with cognitive reserve such that comparison of individuals with the same degree of brain damage shows that those with more years of formal education suffer from less severe symptoms of dementia.

Prior to the current study, brain damage was assessed after death using

brain autopsy measures or using very sensitive functional imaging measures in live individuals. Perneczky comments: "Our study is the first to show that formal education also modifies the association between brain damage and clinical symptoms of dementia in Alzheimer's disease if brain damage is defined as volume loss on magnetic resonance imaging scans. The relevance of our findings is strengthened by the large sample including 270 patients with Alzheimer's disease. Furthermore, factors with a potential negative influence on cognition and brain volume loss, such as genetic characteristics, age, gender, and brain infarction were also considered." These research results show for the first time that the modifying effect of formal education is robust enough to reduce the negative effects of structural brain damage on cognitive function. Further studies are planned that will include a larger patient cohort and more precise measurement of brain volume reduction.

More information: Perneczky R, Wagenpfeil S, Lunetta KL, Cupples LA, Green RC, Decarli C, Farrer LA, Kurz A. Education Attenuates the Effect of Medial Temporal Lobe Atrophy on Cognitive Function in Alzheimer's Disease: The MIRAGE Study. *J Alzheimers Dis* 17:4 (August 2009).

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