

Brain imaging study supports the 'cognitive reserve' hypothesis

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Individuals with higher education levels appear to score higher on cognitive tests despite having evidence of brain plaques associated with Alzheimer's disease, according to a report in the November issue of *Archives of Neurology*.

The cognitive reserve hypothesis holds that individuals with greater cognitive (thinking, learning and memory) abilities are able to delay symptoms of Alzheimer's disease despite underlying changes in the brain, according to background information in the article. Education is commonly used as a substitute measure of cognitive reserve. "Adjusting for level of Alzheimer disease pathological burden determined at autopsy, greater education has been associated with better cognitive function during life," the authors write. "Education interacts with Alzheimer disease pathological burden such that a greater pathological burden is required to show an effect on cognition among persons with more education."

Catherine M. Roe, Ph.D., and colleagues at the Washington University School of Medicine, St. Louis, studied 37 individuals with dementia of the Alzheimer type and 161 individuals without dementia between 2003 and 2008. Participants reported their education history and took cognitive tests. They were injected with a marker known as carbon 11-labeled Pittsburgh Compound B ([¹¹C]PiB) and then underwent a 60-minute positron emission tomography (PET) scan of the brain. Recent studies have shown that [¹¹C]PiB adheres to beta-amyloid brain plaques associated with Alzheimer's disease, allowing researchers to

identify these characteristics of the disease in living patients.

The level of [11C]PiB uptake interacted significantly with years of education in predicting cognitive test scores. Among individuals whose brains took up higher levels of [11C]PiB, indicating the presence of beta-amyloid plaques, performance on the test increased with increasing education levels. Education was not associated with cognitive scores among those with low [11C]PiB uptake, indicating no plaques.

Source: JAMA and Archives Journals

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