Researchers accurately predict cognitive decline

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(Medical Xpress)—Researchers have shown they can predict impending cognitive decline using a sensitive behavioral task up to three years in advance of clinical evidence. Until now, it has not been possible to reliably differentiate individuals at risk of mild cognitive impairment (MCI) and Alzheimer's disease (AD) from those who are not at risk. The results of this study are in the current (March 2013) issue of the *American Journal of Alzheimer's Disease & Other Dementias*.

Stuart Zola, PhD, director of the Yerkes National Primate Research Center, and his Emory-based research team administered the Visual Paired Comparison (VPC) task using noninvasive, infrared eyetracking to assess memory function, an important function of the medial temporal lobe region of the brain. The team's findings demonstrate the VPC task performance scores are an early predictor of which individuals diagnosed with amnestic MCI (aMCI) will progress to AD during the subsequent three years and which individuals are not at risk. In addition, the findings also predict which control subjects will develop aMCI and which will not.

"Previous studies have focused on detecting the presence of disease," said Zola. "Our study focused on predicting whether and when the disease will occur. The earlier we can intervene, the more likely we can provide more effective treatment. In addition, a three-year advance notice could give families more time to prepare for the future," Zola continued.

The researchers assessed 92 participants who were either diagnosed with aMCI or were elderly control subjects (CON). Participants viewed images on a computer screen while the researchers recorded the participants' eye movements. Researchers compared the scores of the participants on the VPC task with information from their clinical visits and diagnoses. The scores accurately reflected those participants who were most at risk for cognitive decline and those who were not at risk at all. The researchers believe the VPC task also may be useful in predicting onset and progression of memory dysfunction in other medical conditions in which disruption of the medial temporal lobe memory system could occur, for example, depression, autism spectrum disorder and HIV/AIDS.

"The task used for this study was developed in nonhuman primates in our laboratory and then modified for our studies with patients," Zola said. Our findings not only have the ability to impact countless lives, but this study makes clear the translational connection between research in nonhuman primates and applications to the clinical setting and patient care," he continued.

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