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NEWS

RSNA Press Release

MRI Helps Radiologists Predict Future Memory Decline

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OAK BROOK, Ill. - Using magnetic resonance imaging (MRI) to study subtle changes in a specific area of the brain, scientists can predict future cognitive or memory decline in healthy adults, according to a study appearing in the December issue of the journal *Radiology.* This is the first study to use MRI to predict the conversion from normal thought process to a state referred to as mild cognitive impairment.

> **At A Glance**
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> - For the first time, researchers have used magnetic resonance imaging (MRI) to study brain changes that precede memory decline.
> - Medial temporal lobe atrophy rate is the most significant predictor of future cognitive decline in healthy elderly adults.

"We identified progressive brain atrophy as predictive of future cognitive decline among healthy elderly patients," said the study's lead author, Henry Rusinek, Ph.D., associate professor of radiology at New York University (NYU) School of Medicine in New York City.

"We have also shown that looking at the medial temporal lobe, a specific, relatively small brain region, was much more informative than looking at the whole brain," said Dr. Rusinek. The medial temporal lobe is a region near the middle of the brain that includes areas critical to forming new memories.

The researchers studied 45 healthy patients older than 60 to determine if medial temporal lobe atrophy rate predicted future memory decline. The patients underwent MR exams and neurological tests at the beginning of the study and two or more follow-up exams over a six-year period. The images and test results were compared and assessed for changes over time.

Of the 45 patients, 13 (29 percent) demonstrated cognitive decline. Medial temporal lobe atrophy rate was the most significant predictor of decline with overall accuracy of 89 percent.

"This study uses a novel approach to examine longitudinal changes in the brain, which are less subject to bias than existing approaches and are highly reproducible," said co-author Mony J. de Leon, Ed.D, professor of psychiatry and director of the Center for Brain Health at NYU School of Medicine.

The first signs of memory loss are usually diagnosed as mild cognitive impairment. People with mild cognitive impairment decline to dementia at a rate of 10 percent to 15 percent annually, compared with 1 percent to 2 percent among healthy elderly individuals. Accurate and early recognition of changes in the atrophy rate could enable therapy, as well as better tracking of the progression of decline.

"I do not believe that serious memory loss is a natural consequence of aging. A vast majority of elderly we see are very sharp and creative," Dr. Rusinek said. He advises those at risk for memory decline to exercise the brain as well as the body.

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