MRI brain scans accurate in early diagnosis of Alzheimer's disease

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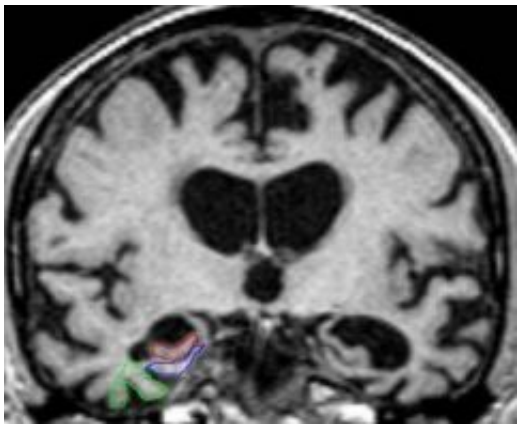

The MRI brain shows severe atrophy indicative of Alzheimer's pathology in all three areas, except the right perirhinal cortex, which has moderate atrophy. Courtesy of Florida Alzheimer's Disease Research Center

MRI scans that detect shrinkage in specific regions of the mid-brain attacked by Alzheimer's disease accurately diagnose the neurodegenerative disease, even before symptoms interfere with daily function, a study by the Florida Alzheimer's Disease Research Center (ADRC) in Miami and Tampa found.

The study, reported earlier this month in the journal *Neurology*, adds to a growing body of evidence indicating MRI brain scans provide valuable diagnostic information about Alzheimer's disease. The findings are important in light of many new disease-modifying drugs in trials -- treatments that may prevent mild memory loss from advancing to full-blown dementia if administered early enough.

"We advocate, based on these findings, that the criteria for the diagnosis of Alzheimer's disease should include MRI scans," said the study's lead author Ranjan Duara, MD, medical director of the Wien Center for Alzheimer's Disease and Memory Disorders at Mount Sinai Medical Center who is affiliated with the University of Miami Miller School of Medicine and University of South Florida College of Medicine. "By incorporating MRIs into the assessment of patients with memory problems, early diagnosis can be standardized and done far more accurately."

"This study demonstrates that MRI brain scans are accurate enough to be clinically useful, both in diagnosing Alzheimer's disease itself at an early stage and in identifying people at risk of developing Alzheimer's," said Florida ADRC Center Director Huntington Potter, PhD, a neuroscientist at the Byrd Alzheimer's Center and Research Institute, University of South Florida.

Alzheimer's disease, the most common cause of dementia, is characterized by memory loss, disorientation, difficulty with reasoning and the decline of language and thinking skills. Alzheimer's is diagnosed by a process of elimination since many other diseases and related disorders can mimic its symptoms, and autopsy is currently the only definitive way a diagnosis can be confirmed. The diagnosis often includes a medical history, mental status tests, neurological evaluations and blood tests. Physicians typically use brain scans only to exclude conditions that can also cause memory deficits, such as strokes and brain tumors.

The Florida researchers used a new visual rating system to evaluate the severity of shrinkage, or atrophy, in the brain's medial temporal lobe – specifically in three structures essential for the conscious memory of facts and events. They compared the MRI brain scans of 260 people -- a group with probable Alzheimer's disease, two groups with varying degrees of mild cognitive impairment (mild memory problems), and a control group of normal elderly with no discernable memory loss. They found that scores generated by this MRI-facilitated test accurately distinguished each group from the other and correlated with the types of memory problems most frequently caused

by Alzheimer's disease. The more extensive the brain atrophy, the more advanced the clinical stage of Alzheimer's disease.

The researchers even found brain atrophy in some people without memory complaints at the study's onset who demonstrated memory decline when assessed a year or two later. This suggests MRIs could predict who will get the disease well before signs of dementia become apparent by other diagnostic methods as well as rule out an Alzheimer's diagnosis in people experiencing memory problems, Dr. Duara said. "If you don't have changes in these three particular areas of the brain, then you don't have Alzheimer's."

Researchers at centers like Miami's Wien Center and USF's Byrd Institute are developing new Alzheimer's drugs that attack mechanisms leading to the death of nerve cells and their connections. The emergence of these disease-modifying treatments has made an earlier diagnosis of Alzheimer's increasingly important, Dr. Duara said. "Having an accurate diagnosis will allow us to start using drugs earlier. The earlier treatment begins, the more likely you are to stop disease progression and benefit the patient."

Most participants in the MRI study were enrolled in the clinical arm of the Florida ADRC, which is supported by a grant from the National Institute on Aging.

The Florida ADRC, the first statewide, multi-center ADRC in the United States, was critical for the successful implementation of the study, said Dr. Potter, the study's senior author. "To validate any new diagnostic test or treatment, you need a large number of diverse volunteers for good comparisons. Alzheimer's research is a partnership between the scientific community and study volunteers; we need both to solve the complexities of Alzheimer's disease."

Source: University of South Florida Health