

A major problem for the care of and research into Alzheimer's disease and other dementias is accurate diagnosis. This is particularly true for patients with early, mild Alzheimer's disease and other dementias. There are 4 major causes of dementia in older Americans – Alzheimer's disease, Lewy body dementia, vascular dementia, and Frontotemporal dementia. Each of these disorders has characteristic behavioral and pathological features. For example, early memory dysfunction is a symptom of Alzheimer's disease caused by brain abnormalities such as amyloid plaques and neurofibrillary tangles. A clinical diagnosis is based on a careful history of the patient's symptoms supplemented with a formal evaluation of a patient's thinking abilities through neuropsychological testing. The conventional brain imaging methods, MRI and CT scans, are used to only exclude rare causes of dementia like brain tumors. At the onset of dementias, however, there is often significant overlap in patients' symptoms and other features. A patient with Lewy body dementia, for example, could primarily exhibit memory challenges, leading to a diagnosis of Alzheimer disease. Currently, a truly accurate diagnosis is possible only after death with an autopsy evaluation. Prior studies comparing results of expert clinical diagnosis with autopsy diagnosis has shown that the clinical diagnosis is often inaccurate.

In an effort to improve clinical diagnosis of Alzheimer's disease and other dementias, MADRC researchers are evaluating a new set of brain imaging methods. These methods use positron emission tomography (PET) scanning to identify characteristic features of Alzheimer's disease and Lewy body dementia. While MRI or CT scans evaluate brain structure, PET imaging can evaluate brain function and chemistry. Each individual participating in the MADRC Brain Imaging Projects undergo a careful evaluation including detailed neuropsychological testing and 2 PET scans. One PET scan identifies amyloid plaques, a characteristic feature of Alzheimer's disease and the other PET scan identifies a characteristic feature of Lewy body dementia. Using PET imaging, we can classify research participants as suffering from Alzheimer's disease, Lewy body dementia, or Frontotemporal dementia. These PET scan results are compared with conventional clinical diagnosis by expert clinicians in the MADRC. We've found that the PET diagnosis of dementias and the initial expert clinical diagnosis are often different. While further follow-up and analysis will be needed, these results suggest that PET imaging methods can improve diagnosis of dementias in early, mild dementia.

For more information on research participation, please call (734) 936-8764

