Predicting MCI to Alzheimer's disease progression with PET

A positive [18F]flutemetamol PET scan for brain amyloid may better enable clinicians to predict patients' progression from amnestic Mild Cognitive Impairment (aMCI) to probable Alzheimer's disease (pAD).

The collaborative study, which included researchers from the University of Pennsylvania, the Nova Southeastern University and the Wien Center for Alzheimer's Disease and Memory Disorders, was presented at the Alzheimer's Association International Conference 2014 (AAIC).

Improving diagnostic tools
General Electric Healthcare developed [18F]flutemetamol, a radioactive diagnostic drug that is used for positron emission tomography (PET) brain imaging. In October 2013, the U.S. Food and Drug Administration approved [18F]flutemetamol for evaluating adults for AD and other forms of dementia. Marketed as VIZAMYL, the drug attaches to beta amyloid, allowing researchers to view and evaluate the presence and accumulation of beta amyloid, which is believed to play a significant role in memory decline.

Using [18F]flutemetamol in studies
Researchers worked with 232 patients who had MCI, which referred to cognitive problems that were not serious enough to impact daily functioning or living. Therefore, it is not classified as dementia. Each participant received a [18F]flutemetamol injection and underwent PET brain scans. Five independent blinded readers viewed the images and determined whether they were [18F]flutemetamol negative or positive. This indicated whether there was beta amyloid present.

The team reported that study participants who had [18F]flutemetamol positive images were roughly 2.5 times more likely to advance to pAD than those whose images were [18F]flutemetamol negative.

David Wolk, M.D., assistant director of the Penn Memory Center and lead investigator of the study, noted that the findings were significant, but require more research.

"These findings demonstrate the potential role of [18F]flutemetamol in stratifying those patients at higher risk of developing Alzheimer's disease, beyond its use as a diagnostic tool," said Wolk. "In addition to providing patients with potentially important prognostic information about their likelihood of developing dementia, identifying high risk patients could help guide physicians' recommendations for patient monitoring, care plans and use diagnostic resources. These are exciting results, but we need further research to fully understand how this might be used in clinical practice."

The study underscores the importance of exploring all the potential of in vivo imaging, from being a diagnostic tool to drug development and clinical treatments. Being able to predict the likelihood of pAD development early on can improve quality of care and life for patients with MCI.