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Amyloid Imaging

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Disclosures:
Speaker's bureau: Accera, Forest, Lilly, Novartis
Advisory board: Accera, Lilly, Novartis

Disclosures

- Accera Pharmaceutical: < $3000 Advisory board and Speaker’s bureau
- Forrest: <$5000 Speaker’s bureau
- Lilly (Avid): <$2000 Advisory board and Speaker’s bureau
- Novartis: > $10000 Advisory board and Speaker’s bureau
- Pam Lab: <$1500 Speaker’s bureau

Introduction

- I would like to review for the panel 3 “real-life “ case studies that demonstrate the value of amyloid imaging for patients and the practicing physician.
- CMS recognizes that “the impact of the diagnostic test is generally derived from downstream changes in patient management…” The first question being addressed by the panel: is there adequate evidence that PET amyloid imaging changes health outcomes in patients with early symptoms or signs of cognitive dysfunction?
- I will illustrate that it does.

Case 1: Negative Scan

- The first patient is a 72-year-old primary care physician with a several year history of memory loss that is worse in the last 6 months. He was so concerned that he was developing Alzheimer's disease that he was considering retiring from his practice. He was evaluated by one of his colleagues and started on donepezil.
- He came for evaluation and had mild episodic memory loss with a MMSE of 29, FAQ of 0, AVLT of 27. Otherwise he was in good health and taking medication for hypertension and gout. He was referred for an amyloid scan which was negative.
- It was determined that his risk of worsening from his current MCI diagnosis is very low. Results from a 3 year multicenter longitudinal trial "suggest that AB negative MCI or CN subjects are unlikely to experience significant cognitive deterioration or to progress to dementia in the 3 years following the evaluation" (Doraiswamy). He stopped the donepezil and returned happily to his practice. Over the ensuing time his cognitive scales have remained stable.
- We have numerous similar cases.

Doraiswamy PM, Sperling RA, Coleman RE, et al: for the AV45-A11Study Group. Prognostic significance of Florbetapir (18F-Florbetapir) PET imaging for future cognitive performance in recently diagnosed MCI: Final results from a 3 year multicenter longitudinal trial AAIC Vancouver 2012.

Case 2: Positive Scan

- Case 2: A 69 year old management executive was brought to the office by his wife after she realized he did not remember several conversations. She also noted that he had forgotten several important office meetings. His secretary noted that he did not remember names of people he previously knew well. He was misplacing his keys and wallet. He still handles the finances for the corporation, but not quite as quickly as before and made some uncharacteristic mistakes. He was very healthy taking only simvastatin and low dose aspirin. He had a strong family history of dementia with both his parents diagnosed with Alzheimer's disease.
- His general physical and neurological exam were normal. His MMSE was 28, FAQ was 1, AVLT was 33. MRI and blood work were normal.
- The diagnosis was MCI. He had heard about and requested amyloid imaging. His scan was positive. Subjects "with MCI with higher levels of cortical AB on PET are at higher risk for future cognitive progression than individuals with lower levels of amyloid." (Doraiswamy). He has volunteered to be in a clinical trial with an amyloid lowering compound.

Doraiswamy PM, Sperling RA, Coleman RE, et al: for the AV45-A11Study Group: Amyloid-B assessed by florbetapir F18 PET and 18-month cognitive decline: a multicenter study. Neurology 2012: 79: 1636-1644

Case 2: Positive Scan

- He is being a little more careful at work particularly with financial documents. He has reviewed his own personal financial plans to make certain they reflect his current and future wishes.

Case 3: PositiveScan

- The 3rd case involves an 83-year-old man with a history of memory loss for 4 years. He recently developed some mild unsteadiness walking. He had a history of prostate cancer and received radiation therapy and had mild urinary incontinence. His primary care physician had ordered an MRI scan of the brain which demonstrated some moderate hydrocephalus with mild cortical atrophy and some widening of the Sylvian fissure. He clearly had significant functional loss and was no longer driving a car. His son handles his financial affairs. Behaviorally he was mildly irritable.

- He was on medication for diabetes and hypertension. He had hearing loss and wears hearing aids. MMSE was 14, FAQ was 22, clock was 3, Cornell scale was 8. Labs showed no significant abnormalities. Physical exam: BP was 144/84. Mild ataxia.

Case 3: Positive Scan

- Amyloid PET scan was done and was positive.

- After a long discussion with the family it was decided not to proceed with a lumbar puncture to evaluate the patient for possible ventricular shunt. The positive scan made us believe that a significant component of his dementia was related to plaque pathology and that the main cause of his dementia was probably due to Alzheimer's disease. The risk benefit analysis of considering a shunt with this history and positive amyloid scan seemed poor.
- Patient was started on donepezil and subsequently memantine was ordered. He is being followed in the practice.

Practical Guidelines for Amyloid Imaging

Consider imaging:

1)mild cognitive impairment to stratify amyloid positive and amyloid negative scans

2)atypical cases or consideration of frontal temporal dementia

Less likely to image:

1)no impairment, or as a screening procedure

2) long term patients with classical history of Alzheimer's disease with typical decline and amyloid scan results unlikely to significantly alter treatment plans