Our goals: to determine AD before its clinical appearance, along with tissue, potential use of fluids for cytology.

Prion

The most common type of dementia, originating as mild cognitive impairment (MCI) and progressing to Alzheimer’s disease (AD) through a series of stages:

1. Excess production, 2. Defective removal, or 3. Both
   - Accumulation of amyloid and NFT
   - CAA (cerebral amyloid angiopathy) and tauopathy
   - Prion-like nature of cleavage as before seen, in:
     - Parkinson’s Lewy bodies
     - ALS
     - FTLD

Preclinical diagnosis occurring at autopsy

Thus far, frontal retention of PIB is clinically significant in MCI and II with extracellular amyloid and NFT (neurofibrillary tangles)

Societally: a puzzling neurological degenerative disorder that we still have no clinical treatment for, nor an official metric for pre-clinical diagnosis

“STAGING”

- A neurodegenerative disorder, not a cancer.
- Braak Staging
  - To assist with determination of pre-clinical staging
    - I and II with NFT in trans-entorhinal region of brain (medial of temporal lobe)
    - III and IV in limbic regions (e.g.) hippocampus
    - V and VI with extensive neocortical involvement
- Thal Staging
  - Plaque formation and its location
    - 1) Neocortex 2) Hippocampus 3) Basal ganglia
    - 4) Midbrain/medulla oblongata 5) Pons/cerebellum

ONGOING RESEARCH

- Pittsburgh B compound
  - An attempt to deter AD’s definitive diagnosis occurring at autopsy
  - A radioligand: high amyloid affinity, entering BBB well enough to be visible on PET scans, rapid clearance from blood
  - Thus far, frontal retention of PIB is clinically significant
  - Cleaving nature of amyloid and tau proteins, how to tackle polymorphic nature?
  - Increased difficulty of research, unable to test for infinite protein types
  - Ca++ concentration monitoring, as formation of calcium-permeable membrane pores occurs
  - An attempt to understand why AD is not observed in non-humans, despite our similar biological genotyping with other primates
  - Prion-like nature of AB + tauopathy, and comparing AD to other neurodegenerative disorders
  - Tau involvement with stabilization of microtubules, and the turning point towards its aberrant nature
  - Brain damage of NFL athletes, correlation with neurodegenerative disorders and recurrent concussions

REFERENCES


Khanlou N, Yahi ASF, Di Scala NR, Chahinian AP. Biomarkers of Alzheimer’s Disease. Scientific Reports, 6(1), 28781.