

p-036

Thursday

Longitudinal change in synaptic density in primary tauopathies – a [11C]UCB-J PET study.

Negin Holland, P Simon Jones, George Savulich, Maura Malpetti, Elijah Mak, Timothy Rittman, Timothy Fryer, Young Hong, Franklin Aigbirhio, John O'Brien, James Rowe

State of the art

Synaptic loss is severe in the primary tauopathies of progressive supranuclear palsy (PSP) and corticobasal degeneration (CBD), and correlates with clinical disease severity (Holland *et al.* 2020; 35(10):1834-1842). Here, we investigate longitudinal synaptic loss *in vivo* in PSP and CBD.

Methodology

We recruited 31 people with PSP and 17 people with amyloid-negative corticobasal syndrome (determined by [11C]PiB and referred to as CBD). Synaptic density was estimated with [11C]UCB-J PET, and regional non-displaceable binding potentials estimated in regions of interest from the Hammersmith Atlas, at baseline and annual follow-up. Disease severity and progression were assessed with the PSP rating scale (PSPRS).

Results

20 patients have completed longitudinal synaptic imaging (14 PSP, 6 CBD; 9M:13F): age 71.7 years (± 8.8), symptom duration at follow-up 5.3 years (± 1.7), baseline PSPRS: 30.2 (± 9.6), follow-up PSPRS: 44.8 (± 15.2), scan interval 13.0 months (± 3.9). Preliminary analysis shows that the mean annual rate of synaptic loss is maximal in the pallidum, anterior cingulate, and thalamus at 4% per year, and middle and superior frontal gyri at 3%. There was a trend towards an interaction between annual synaptic loss and annual increase in the PSP rating scale, i.e. disease progression ($F=3.2$, $T=-1.8$, $p=0.07$), and a symptom duration-by-disease progression interaction with annual rate of synaptic loss ($F=12.4$, $T=-3.5$, $p=0.0004$).

Conclusions

Our preliminary results indicate progressive synaptic loss in PSP and CBD. Further work will examine the relationship between synaptic loss, atrophy, progressive tau burden and neuroinflammation.

Conflicts of interest

I, nor any of my co-authors, have any conflict of interest to disclose.