Background: Abnormalities in Aβ and tau begin years prior to the clinical presentation of Alzheimer’s disease (AD) dementia. The complementary information gleaned from combining Aβ and tau during stages preceding dementia on predicting cognitive decline, especially across different tau measurements (PET vs. CSF), remains unclear. Methods: Participants without dementia from the Alzheimer’s Disease Neuroimaging Initiative (ADNI; N=85 normal, 86 MCI) were classified as Aβ- or Aβ+ using global cortical florbetapir PET values. Florbetapir PET and CSF data closest to the AV1451 scan were used, as well as retrospective cognitive change that occurred prior to the AV1451 scan (mean=5 years). We examined associations between regional AV1451-PET (entorhinal, hippocampus, limbic), CSF total tau (t-tau) and phosphorylated tau (p-tau181), and cognition (memory, executive function). Results: AV1451-PET and CSF measures of tau showed weak-to-moderate correlations, with the highest correlation between AV1451 entorhinal tau levels and CSF p-tau181 (r=0.46, p<.001). Compared to Aβ- individuals, Aβ+ individuals showed higher AV1451-PET values across the entorhinal cortex, hippocampus and limbic regions (p<.001, Cohen’s d=0.9), as well as higher levels of CSF t-tau and p-tau181 (p<.001, Cohen’s d~1) (Figure 1). Within the Aβ+ group, higher levels of continuous Aβ were associated with higher AV1451 values in the entorhinal cortex only, and were not related to CSF t-tau or p-tau. Regional AV1451 levels in the entorhinal cortex and hippocampus were associated with retrospective memory decline in the Aβ+ group only (Figure 2). CSF t-tau and p-tau181 were not related to any cognitive measures in either Aβ group. Conclusions: CSF and PET tau measures are elevated among Aβ+ individuals without dementia. However, the direct associations between CSF and PET tau measures were only moderate. Further, AV1451 PET values were associated with memory decline, and this association was specific to the Aβ+ group. Taken together, these analyses highlight that CSF and PET measures of tau capture different aspects of early AD pathogenesis.

Background: Dementia with Lewy Bodies (DLB) is characterized by both cortical and sub-cortical cognitive impairments. Roughly, they comprised visuo-constructive, executive and attention deficits, whereas memory would remain relatively spared. In this study, we focused on the neuro-anatomical substrates of attention dysfunction, in particular in terms of its slowdown, which appears to be specific to early DLB, compared to other neurodegenerative pathologies. For the purpose of the study we examined correlations between attentional behavioral scores and the degree of cerebral atrophy in patients in the early stage of DLB. Methods: Eighty-seven prodromal to mild DLB patients according to McKeith et al criteria (2005, 2017) were selected to participate in the study as well as prodromal to mild DLB patients according to McKeith et al criteria. Symbol substitution task were used to specifically assess attentional processing speed. 3D MRI images were acquired for all participants, and correlational analyses were performed in the patient group using voxel-based morphometry (VBM). Behavioral performances were compared between patients and healthy control subjects. Results: Behavioral results obtained on both TMTA and digit symbol substitution task showed significantly impaired performances in patients in comparison to control subjects. In addition, correlation analyses between behavioral scores and the degree of cerebral atrophy revealed for the TMTA positive correlations of a large bilateral cluster including the caudate nucleus, the putamen, the globus pallidus, the thalamus and sub-thalamic nucleus, as well as a cluster located in the medial frontal gyrus. Some positive correlations associated with the digit substitution task were found in the right inferior frontal gyrus and in the left thalamus. Conclusions: Behavioral results are in line with the literature on DLB cognitive profile and confirm the existence of impairment in attention function. Interestingly, VBM analysis revealed the large involvement of basal ganglia which are part of the attention cerebral network suggesting the important role of these structures for attentional processing. This also suggests the early clinical implication of damage in the basal ganglia in patients in the early stage of DLB.