Centiloid values obtained using SPM and CapAIBL using AIBL and Centiloid calibration PiB PET images.

Figrue 1. [18F]Florbetapir SUVR cut-off values at every voxel.

and -7.24% in the HC-. Using the slope and intercept to perform the Centiloid transformation resulted in a reduced mean error of -0.52% in the AD+ and 1.12% in the HC-. **Conclusions:** Reliable Centiloid measures can be obtained for PiB images using the PET-only method CapAIBL using the recommended calibration method. Using the estimated slope and intercept to further correct the estimation of the Centiloid values might however be desirable to reduce the quantification errors.

IC-P-025 **[18F]FLORBETAPIR ROC CURVE AT EVERY VOXEL REVELS A WIDE RANGE OF CORTICAL SUVR CUT-OFFS**

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Background: During the last decades researchers have been using global measurements of amyloid−PET ligands to dichotomize subjects into amyloid-β (Aβ) positive or negative groups. The Aβ dichotomization is desirable to enrich clinical trials population and to assess the influences of Aβ abnormalities on Alzheimer's disease (AD) progression. However, dichotomizations using global measurements do not provide information regarding the regional pattern of Aβ abnormalities, which may be important to identifying nondemented individuals fated to AD clinical progression. Here, we tested the framework that cut-off analysis performed at every voxel may provide additional information as compared to global estimates. **Methods:** We assessed cognitively normal (n=209), mild cognitive impairment (MCI; n=311) and AD (n=81) individuals from ADNI cohort who underwent [18F]Florbetapir PET at baseline
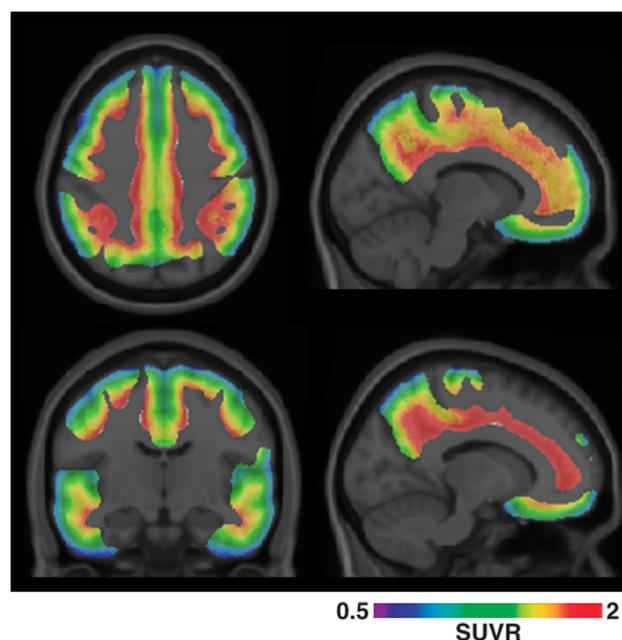
(Table 1). The standardized uptake value ratio (SUVR) maps were then generated using the cerebellum grey matter and the global white matter as reference regions. First, a receiver operating characteristic (ROC) curve was performed at every voxel contrasting controls and AD participants. Second, the optimal cut-off value at every voxel was calculated using the least distance from (0,1) point to the ROC curve (best operating point) (Figure 1). Third, parametric maps of diagnostic sensitivity and specificity were generated (Figure 2). Finally, probabilistic maps for baseline Aβ positivity at every voxel were generated for MCI converters (n= 55) and non-converters (n= 256) over 2 years (Figure 3). **Results:** The highest SUVR cut-off values were found in the precuneus, anterior and posterior cingulate cortices, whereas the lowest were found in clusters in the temporal lobe (Figure 1). Diagnostic sensitivity and specificity were the highest in clusters in the precuneus, posterior cingulate, temporal, and frontal cortices (Figure 2). Probabilistic maps showed that MCI non-converters did not present a specific pattern of amyloid deposition at baseline, whereas MCI converters reached 100% of positivity in voxels in the posterior cingulate, precuneus, frontal and temporal cortices (Figure 3). **Conclusions:** Our results re-
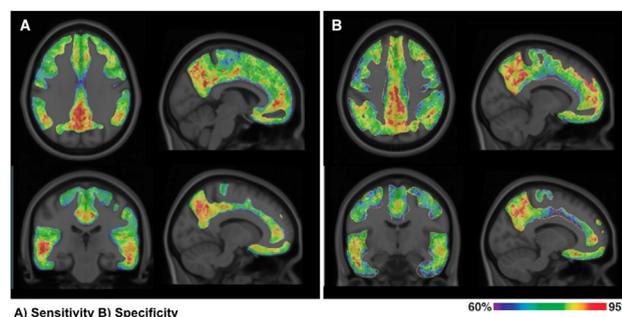

A) Sensitivity B) Specificity

Figure 2. [18F]Florbetapir SUVR cut-off values sensitivity and specificity for a diagnostic of probable Alzheimer's disease at every voxel.
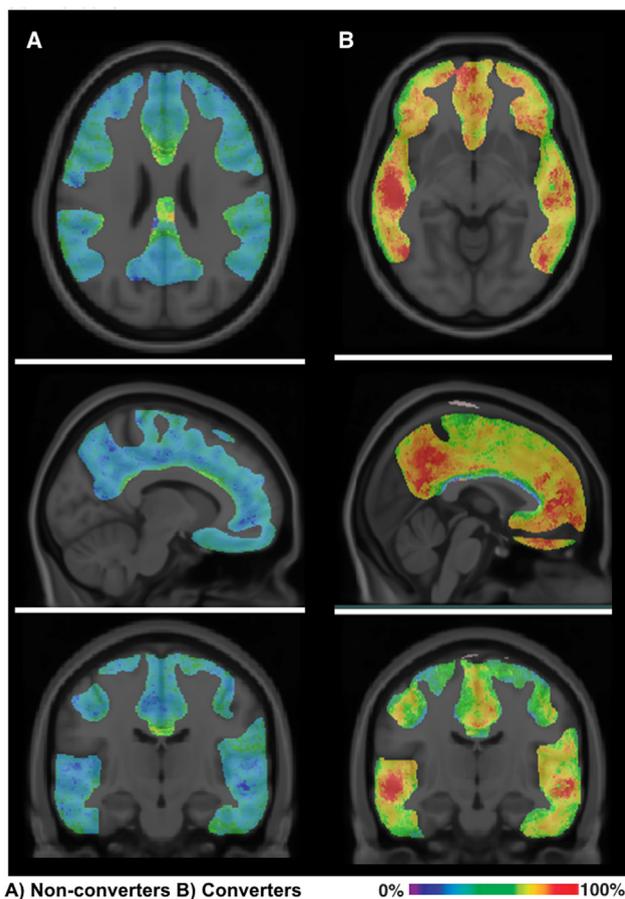
Figure 3. Probabilistic maps of [18F]Florbetapir SUVR positivity at every voxel for MCI Non-converters and converters.

vealed that the analysis of amyloid-PET cut-offs at every voxel might provide important information regarding the patterns of regional Aβ abnormalities associated with the clinical progression to AD.

IC-P-026   **PROBABLE CAA AND CLINICAL IMPLICATIONS IN A LARGE MEMORY CLINIC COHORT**

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Background: Cerebral amyloid angiopathy (CAA) is associated with cognitive impairment, and especially with Alzheimer's disease. CAA manifests as neuroimaging markers of small vessel disease, and a conspicuous marker for CAA is lobar cerebral microbleeds (CMBs). We aimed to study differences in patients with and without probable-CAA and cognitive impairment in a large memory clinic. **Methods:** A total of 1504 patients undergoing memory investigation were recruited in our study. All patients underwent MR imaging with hemosiderin sensitive sequences and 1039 patients had cerebrospinal fluid (CSF) biomarker analysis. Probable-CAA was classified according to the Boston criteria using microbleeds as hemorrhagic markers. MR images were further analyzed for all markers of small vessel disease including superficial siderosis, white matter hyperintensities (WMH), lacunes and enlarged perivascular spaces. Generalized linear models with appropriate corrections were used to assess data. **Results:** A total of 99 patients (46 Alzheimer disease, 27 mild cognitive impairment, 6 subjective cognitive impairment, 9 vascular dementia, and 11 with other diseases) were classified as having probable-CAA. Patients without probable-CAA had lower CSF amyloid β (Aβ) 42 levels (P<0.001); patients with probable-CAA had higher CSF/ serum albumin ratios, reflecting blood brain barrier dysfunction, (P=0.04), as well as a tendency for higher total tau and P-tau levels (P=0.05). Patients with probable CAA had significantly higher burden of WMH (OR: 2.7, 95CI: 1.6-4.5), cortical superficial siderosis (OR: 6.6, 95CI: 2.3-14.8), lacunes 2.2 (1.3-3.8), and significantly lower amount of deep CMBs (OR: 0.04, 95CI: 0.01 - 0.31). There was no difference in amount of enlarged perivascular spaces, as well as MMSE score between patients with and without probable-CAA. **Conclusions:** Patients with cognitive impairment and probable-CAA likely have higher associated neurodegeneration with their disease, and a higher number of associated small vessel disease markers of CAA.

IC-P-027   **AMYLOID-INDUCED MICROGLIAL ACTIVITY IN THALAMOCORTICAL CIRCUITS PREDICTS SUBSEQUENT COGNITIVE DECLINE**

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Background: Although the signature properties of Alzheimer's disease (AD), such as the formation of amyloid plaques, activation of inflammatory responses, and hyperphosphorylation have been well studied, the explanation illustrating a clear relationship specifically between neuroinflammation and cognitive impairment has not yet been discovered. Thus in this article, we employed the McGill-R-Thy1-APP transgenic (Tg) rat model to observe for activation of inflammatory responses and the presence of cognitive decline. We hypothesize that early expression of neuroinflammatory signals will lead to future cognitive decline in the amyloid expressing animals. **Methods:** Microglial activation was measured using the ligand [18F]PBR06 for PET, while cognitive performance was measured with the MWM task in 5 wild-type (Wt) and 8 Tg rats at baseline (BL; 11.5 months) and at follow-up (FU; 16 months). PBR-PET images were processed using the cerebellar grey matter as the reference region and cognitive measurement was calculated as the average times of day 3 and 4 of the water maze task. The baseline as well as the change (FU – BL) in the cognitive measurements were correlated at voxel level using "VoxelStats" toolbox to observe for the effect of group and PBR interaction on the change in the water maze performance. The PBR values were corrected for