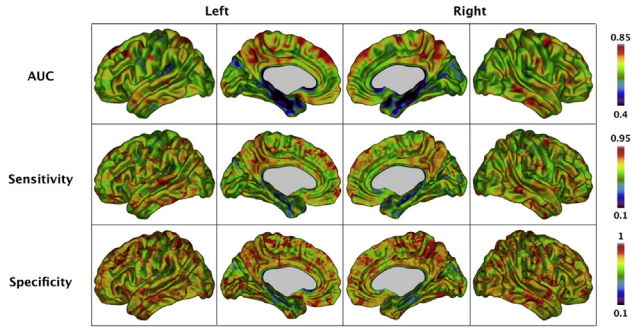

Figure 1. Image shows Area Under the Curve (AUC), sensitivity and specificity of the regional ROC analysis. Regions including the precuneus, posterior cingulate cortex, medial orbitofrontal cortex and temporal lobe showed the highest AUC value indicating the best separation between AD patients and CN individuals. These regions also show a high sensitivity and specificity.

IC-P-012 SHOULD A GLOBAL OR A REGIONAL MEASURE OF AMYLOIDOSIS BE USED IN A LONGITUDINAL STUDY?

Sulantha S. Mathotaarachchi[1], Sara Mohades[2], Monica Shin[2], Thomas Beaudry[2], Andrea Lessa Benedet[2], Tharick Ali Pascoal[1], Seqian Wang[2], Sarinporn Manitsirikul[3], Maxime J. Parent[4], Min Su Kang[5], Vladimir Fonov[6], Chang Oh Chung, Sr.[2], Serge Gauthier[2], Pedro Rosa-Neto[2,7,8,9], *[1]McGill University, Montreal, QC, Canada; [2]McGill Centre for Studies in Aging, Montreal, QC, Canada; [3]McGill Centre for Studies in Aging/Translational Neuroimaging Laboratory, Montreal, QC, Canada; [4]McGill Centre for Studies in Aging, Verdun, QC, Canada; [5]McGill University Centre for Studies in Aging, Verdun, QC, Canada; [6]Image Processing Laboratory, Montreal Neurological Institute, McGill University, Montreal, QC, Canada; [7]Centre for Studies on Prevention of Alzheimer's Disease (StoP-AD Centre), Douglas Mental Health Institute, Montreal, QC, Canada; [8]Douglas Hospital Research Centre, Montreal, QC, Canada; [9]Translational Imaging Laboratory, Montreal, QC, Canada. Contact e-mail: sulantha.s@gmail.com*

Background: Global amyloid burden is widely used as measurement to assess the brain amyloidosis in many studies, but its reliability in a longitudinal study is yet to be fully understood. In this study we developed a surface based technique to assess the relationship between amyloidosis and neurodegeneration measured by hypo-metabolism across diagnosis stages of Alzheimer's disease. We hypothesize that the regional effects of amyloid retention on the rate of hypo-metabolism depend on the diagnosis stage. We will further investigate whether a consolidated measure of amyloidosis (global SUVR) can capture the effects shown in the regional analysis. **Methods:** The study included 213 subjects (65 Cognitively Normal [CN], 111 Early Cognitive Impairment [EMCI], 19 Late Cognitive Impairment [LMCI], 18 Alzheimer's Disease [AD]) taken from the Alzheimer's Disease Neuroimaging Initiative (ADNI) database. Their [^{18}F]Florbetapir and [^{18}F]FDG PET images were acquired 24 months apart and the SUVR maps were subsequently generated using cerebellar grey/white matter and pons as reference regions for [^{18}F]Florbetapir and [^{18}F]FDG PET images, respectively. The effects of [^{18}F]Florbetapir on yearly rate of metabolism were computed using vertex-based regression models including the baseline glucose metabolism, age, gender and APOE genotype as covariates. **Results:** During the 24-month observation period, for the subjects in CN and EMCI stages, the regional rates of hypo-metabolism did not show a linear relationship to the localized amyloid burden. However, at LMCI and AD stages, regional amyloid load shows a linear relationship to the rate of metabolic decline in precuneus and temporo-parietal areas (Figure 1). In contrast, the global measure of amyloid burden showed a linear relationship with metabolism only in temporal regions. **Conclusions:** Based on the results it is evident that in LMCI and AD stages, the rates of hypo-metabolism at temporo-parietal areas as well as in the precuneus depend on the local tissue amyloid burden, while in CN and EMCI stages, it is independent. Absence of a relationship in similar regions with the global measure amyloidosis suggests that a consolidated measure cannot represent the brain amyloid burden in all disease stages, and perhaps, a new consolidation masks need to be generated based on disease stage.

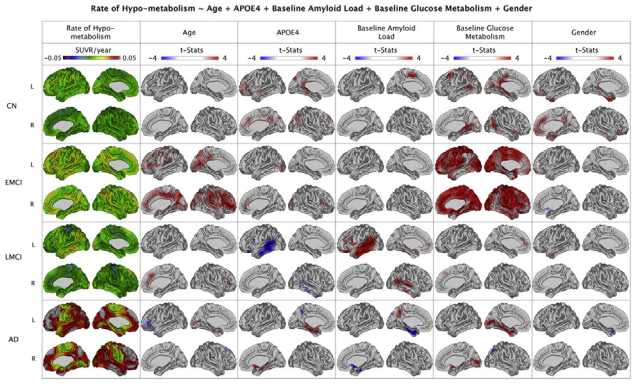

Figure 1. Vertex-based multivariate linear regression model showing the effect of amyloid load on the rate of hypo-metabolism in each disease stage, corrected for baseline glucose metabolism, age, gender and apoe genotype. Only LMCI and AD stages show positive effect from amyloid load on hypo-metabolism in temporo-parietal and precuneus regions.

IC-P-013 WITHDRAWN

IC-P-014 HOW TO FOLLOW UP AND CLUSTER SUBJECTS BY LONGITUDINAL CHANGES OF FIBRILLARY AMYLOID IMAGING AND CSF BIOMARKERS? A 24-MONTH FOLLOW UP

Sarinporn Manitsirikul[1,2], Sara Mohamedes[3], Sulantha S. Mathotaarachchi[3], Thomas Beaudry[3], Serge Gauthier[3], Pedro Rosa-Neto[3], *[1]McGill Centre for Studies in Aging/Translational Neuroimaging Laboratory, Montreal, QC, Canada; [2]Bangkok General Hospital, Payathai, Thailand; [3]McGill Centre for Studies in Aging, Montreal, QC, Canada. Contact e-mail: ju_sarinporn@yahoo.com*

Background: Presence of amyloid is associated with cognitive decline. Fibrillar amyloid deposition levels in brain can be detected by increase uptake of amyloid in [^{18}F] Florbetapir (AV45) PET and decrease of csfA$\beta_{1\text{-}42}$. Combination of biomarkers performed better for diagnosing AD. Tau was strongest predictor of conversion but Jack et al. propose that CSFA$\beta_{1\text{-}42}$ was abnormal more often than t-tau. Here, we studied relationship between regional distributions of brain fibrillar amyloid deposition, neurodegenerative biomarkers in brain(FDG) and CSF(tau), brain structural change and cognitive function at 24-month follow-up to find the best method to follow up the subjects. **Methods:** We analyzed 182 participants from ADNI and try to cluster the subjects by MCLUSTforR. We divided the