

tia, preserved hippocampal volumes increases the risk of DLB in MCI. Preservation of HV may be a supportive feature of prodromal DLB in patients with MCI.

SATURDAY, JULY 18, 2015
ALZHEIMER'S IMAGING CONSORTIUM (IC)
IC-03

SYMPOSIUM SESSION: HIGHLIGHTING EMERGING TOPICS

IC-03-01 CARDIORESPIRATORY CAPACITY CORRELATES WITH CEREBRAL BLOOD FLOW, WHITE MATTER HYPERINTENSITIES, AND COGNITION IN PRECLINICAL ALZHEIMER'S DISEASE

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Background: Cerebral hypoperfusion and white matter hyperintensities (WMHs), indicators of poor vascular health, are often observed in Alzheimer's disease (AD). Physical fitness improves vascular health and is protective against AD, yet little research has examined the influence of fitness on cerebral blood flow (CBF) and WMHs in individuals at-risk for AD. Therefore, the objective of this study was to determine whether cardiorespiratory capacity is associated with increased CBF in AD-related brain regions, decreased WMHs, and better cognitive performance in a middle-aged cohort at-risk for AD. **Methods:** 105 cognitively-healthy adults from the Wisconsin Registry for Alzheimer's Prevention (age=64.06±5.90 years) participated in this study. Participants performed graded treadmill exercise testing, and peak oxygen consumption (VO₂peak, ml/kg/min) was used as the index for cardiorespiratory capacity. Participants underwent comprehensive cognitive testing, T1-weighted and T2 FLAIR structural MRI scanning, and CBF assessments using pseudocontinuous ASL. CBF values were sampled from regions implicated in AD using the Alzheimer's Disease Neuroimaging Initiative FDG Meta-ROI suite that includes the left and right angular and temporal gyri, posterior cingulate, and a composite ROI. Total WMHs were quantified using Lesion Segmentation Toolbox, and adjusted for intracranial volume in analyses. Linear regression, adjusted for relevant covariates, was used to examine relationships between VO₂peak, CBF, WMHs, and cognition. **Results:** Higher VO₂peak was associated with greater CBF in the left (p=.047) and right (p=.006) angular gyri, right temporal cortex (p=.019), and the composite ROI (p=.011). VO₂peak was also associated with better cognitive performance in Speed & Flexibility (p=.020), a composite measure consisting of Trails A&B and the Stroop Color-Word Test Interference Trial. VO₂peak was not associated with WMHs (p=.931), however VO₂peak did modify

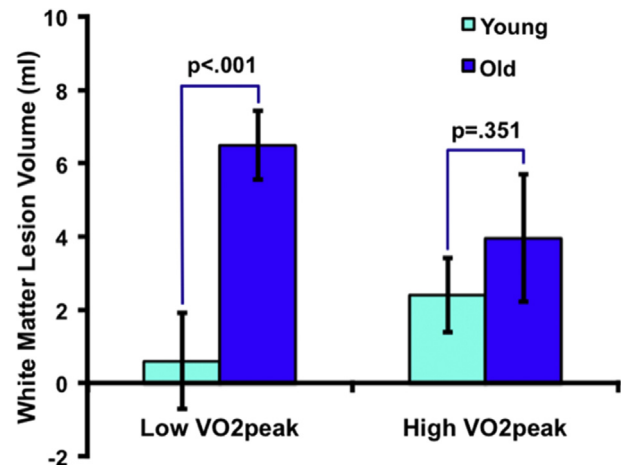


Figure. High cardiorespiratory capacity modifies the detrimental effects of age on white matter lesion burden.

Adjusted means and standard errors are displayed from the analysis modeling total white matter lesion volume as a function of age, sex, peak effort attainment, intracranial volume, VO₂peak, and a VO₂peak*age interaction. The VO₂peak*age interaction term was the effect of primary interest. VO₂peak and age were included as continuous variables in the analysis, but for graphing purposes we chose two anchor points (i.e., ± 1 SD) to represent Low vs. High VO₂peak and Young vs. Old age.

VO₂peak = peak oxygen consumption (ml/kg/min).

the association between age and WMHs such that more fit individuals had fewer WMHs with increasing age compared to their less fit peers (p=.046; Figure). **Conclusions:** Higher cardiorespiratory capacity is associated with greater CBF in key AD brain regions, better executive function, and modifies the relationship between age and WMH burden in a cohort at-risk for AD. This suggests that participation in regular exercise may increase brain vascular health and cognitive function, thereby decreasing future risk for AD.

IC-03-02 EARLY FRAME OF PIB AND FDG IN AUTOSOMAL DOMINANT ALZHEIMER'S DISEASE: SIMILARITY, DISCREPANCY, AND CLINICAL IMPLICATION

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Background: Alzheimer's disease (AD), the leading cause of dementia in the elderly, can affect individuals in their thirties in autosomal dominant form. The Imaging Core of the Dominantly Inherited Alzheimer Network (DIAN) aims to characterize transition from pre-clinical to symptomatic disease using imaging biomarkers. Decreases in cerebral glucose metabolism in the parietal lobe are detectable 10 years before the estimated year of symptom onset (EYO) (Benzinger, Blazey et al., 2013) and may represent synaptic dysfunction. In