IC-P-021 INVESTIGATION OF PITTSBURGH COMPOUND-B BINDING IN WHITE MATTER HYPERINTENSITIES

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Background: Pittsburgh compound-B (PiB) binds to cortical beta amyloid, but little is known about PiB uptake in the white matter (WM) (Goodheart et al., 2015). Decreased PiB uptake has been observed in demyelinating WM lesions of patients with multiple sclerosis (Bodini et al., 2016), and histopathologic analysis suggests that PiB may be binding to the beta-pleated sheet of the myelin basic protein (Stankoff et al., 2011). Based on this premise, we investigated the WM PiB binding in relation to white matter hyperintensities (WMH) in a population-based cohort of clinically normal participants across a wide age range. **Methods:** Clinically normal participants from the Mayo Clinic Study of Aging (n=794; age range=41-95) were included. WMH were segmented using a semi-automated segmentation algorithm on FLAIR MRI. Segmented WMH and WM masks from FLAIR images and T1-weighted MRI images were used to derive the regional WMH and the normal appearing WM (NAWM) PiB uptake from the PiB-PET images registered to subject's own T1-weighted MRI. WMH and NAWM PiB SUVr were calculated as a ratio of WM regional PiB uptake to the cerebellar crus PiB uptake. **Results:** The WMH PiB SUVr was lower (mean±SD =1.84±0.20) compared to NAWM PiB SUVr (mean±SD =2.02±0.21) (paired t-test; p<0.001; Figure 1). Both the WMH and the NAWM PiB SUVr increased with age (p<0.001; Figure 2) and with the global cortical PiB SUVr, even after adjusting for age (multiple linear regression; p<0.001; Table). **Conclusions:** The findings support that the biologic basis of lower PiB uptake in the WMH may be associated with loss of myelin integrity in the WM. However, since myelin is lost with age, the gradual increase of WM PiB uptake with aging suggests that other aging-related mechanisms are also influencing WM PiB uptake. Contribution of WMH to the WM PiB SUVr should be considered when WM PiB uptake is used as a reference region for the evaluation of cortical PiB uptake.

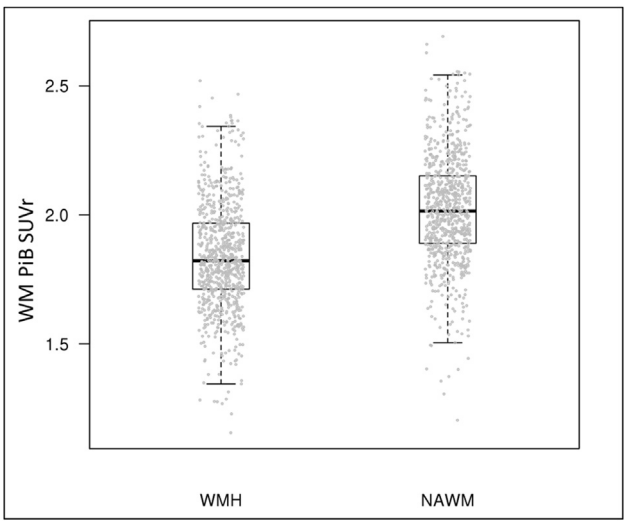

Figure 1.

Table
Models with age and cortical PiB SUVr as predictors and WM PiB SUVr as response

	WMH PiB SUVr			NAWM PiB SUVr		
	Estimate	SE	P-value	Estimate	SE	P-value
Intercept	1.457	0.047	<0.001	1.485	0.045	<0.001
Age	0.004	0.001	<0.001	0.006	0.001	<0.001
Cortical PiB SUVr	0.235	0.035	<0.001	0.277	0.034	<0.001

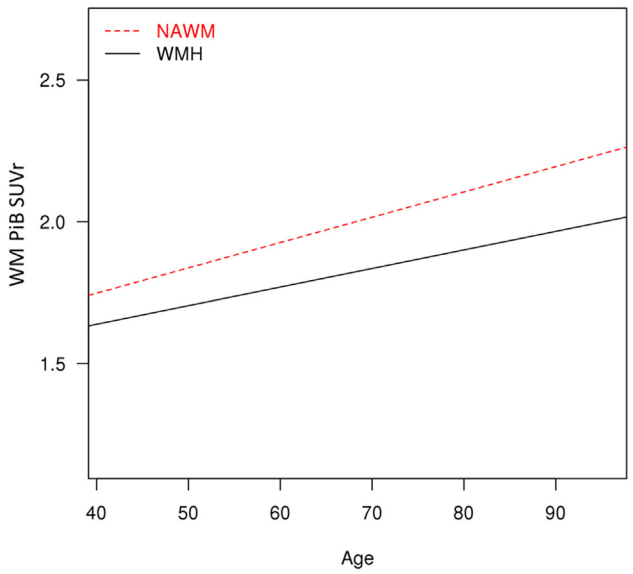

Figure 2.

IC-P-022 IN VIVO PET IMAGING OF MITOCHONDRIAL ABNORMALITIES IN A MOUSE MODEL OF TAUOPATHY

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Background: Damaged mitochondria may be one of the earliest manifestations of Alzheimer's disease (AD), with mitochondrial bioenergetic dysfunction observed long before symptomatic onset both clinically and in mouse models of the disease. The aim of this study was to evaluate mitochondrial abnormalities in the brains of living tau transgenic (tauTg, rTg4510) mice using a novel PET probe targeting mitochondrial complex I (MC-I), which mediates the first and rate-limiting step in oxidative phosphorylation. **Methods:** MC-I, tau deposition and inflammatory signals were assessed in the brains of living non-Tg and tauTg mice at 2 and 7 months of age by PET using ^{18}F-BCPP-EF, ^{11}C-PBB3, and ^{18}F-FEBMP, respectively. Brain atrophy was also evaluated by volumetric MRI, and learning and memory impairments were