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P2-187 Hippocampal and amygdalal brain changes in young-old and very-old with Alzheimer's disease: associations with neuropsychological functioning

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sections of patients with GSS showed numerous lesions stained with methoxy-XO4. The methoxy-XO4 staining was highly specific both in mice and humans, with no other structures being detected. **Conclusions:** Prion amyloid deposits can be successfully targeted *in vivo* using methoxy-XO4. Radiolabeled derivatives of Thioflavin and Congo red are viable candidates for PET imaging ligands for the improved diagnosis of human prion diseases associated with amyloid deposition. Supported by research grants from NIH/NIA (AG20747, AG202245) and Alzheimer’s Association.

P2-187 HIPPOCAMPAL AND AMYGDALAL BRAIN CHANGES IN YOUNG-OLD AND VERY-OLD WITH ALZHEIMER’S DISEASE: ASSOCIATIONS WITH NEUROPSYCHOLOGICAL FUNCTIONING

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Background: Structural and functional decline associated with normal aging has led some investigators to suggest that less Alzheimer’s disease (AD) pathology may be needed to produce pathologic cognitive decline in the Very-Old compared to the Young-Old (Terry et al., 1999). Bondi et al. (2003) recently reported that, when AD patients are compared to their age-appropriate control groups, the profile of neuropsychological deficits associated with AD in the Very-Old is less severe from that in the Young-Old. **Objective:** To assess possible interactions between age and disease on structural decline, we examined volumes of structures affected early in AD: the hippocampus and the amygdala. **Method:** Seventy-six individuals were assigned to one of four groups based on age and diagnosis: (1) Young-Old NC and AD groups included individuals ages 70 or younger, and (2) Very-Old AD and NC groups comprised of individuals ages 75 or greater. **Results:** The two AD groups significantly differed on raw volumes and their respective age-corrected z-scores for both the hippocampus ($p = 0.004$) and the amygdala ($p = 0.031$); Very-Old AD demonstrated significantly more atrophy (mean hippocampus z-score = -2.08 ; mean amygdala z-score = -1.92) relative to Young-Old AD (mean hippocampus z-score = -1.18 ; mean amygdala z-score = -1.32). However, these findings differed from their neuropsychological performances. Specifically, we found that the two AD groups significantly differed on their age-corrected z-scores on tests of memory (all $ps < 0.001$) in the opposite direction, with Very-Old AD performing significantly better than Young-Old AD relative to their age-appropriate normal control groups, despite significantly greater atrophy relative to their control group. **Conclusions:** Results suggest future research is needed to refine the pattern of deficits expected in the Very-Old and to validate such deficits with imaging techniques. In addition, these results do not support the hypothesis that less AD pathology is needed to evince comparable cognitive deficits in the Very-Old compared to the Young-Old. However, future volumetric studies should further assess this question in other neocortical association areas. Supported by: NCCR P41-RR14075, R01RR16594-01A1, & M01RR00827 BIRN(www.nbirn.net); MIND Institute; NIH/NIA P50AG05131, RO1 AG12674, & AG04085; and DVA Medical Research Service.

Table 1. Demographics

	Young-Old NC	Very-Old NC	Young-Old AD	Very-Old AD
n	15	18	16	27
Age	60.40 (6.94)	78.61 (3.17)	64.31 (4.98)	78.19 (2.27)
Education	14.80 (2.62)	15.33 (3.50)	14.88 (2.50)	13.30 (3.98)
DRS Total Score	140.00 (3.19)	140.53 (2.35)	109.75 (17.14)	108.36 (17.09)

P2-188 LABELING AMYLOID PLAQUE-LIKE STRUCTURES BY RADIOIODINATED LIGANDS IN RHESUS MONKEY BRAIN

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Background: The deposition of β -amyloid (A β) plaques is a hallmark of Alzheimer’s disease (AD). We have previously developed and characterized several iodinated ligands, which specifically bind to A β plaques in AD and transgenic mouse (Tg) brains. Aged rhesus monkey brains have been shown through immuno- and thioflavin-staining to contain these plaques. While there are many similarities between monkey and human plaque characteristics, differences exist such as a higher proportion of A β 40 over 42 in monkey. **Objective(s):** Radioiodinated ligands were used to detect A β plaques in aged monkey brains and the results were compared with the detection of plaques in AD and transgenic mouse brain sections. **Methods:** Various iodinated ligands were incubated with brain sections from rhesus monkey, transgenic mouse over-expressing A β , or human AD to visualize plaque staining. An emulsion autoradiogram was compared to thioflavin-stained and A β 40 and 42 antibody labeled sections to confirm binding specificity. **Results:** Three radioiodinated ligands - K01-042, IMPY (label plaques containing A β 40 and 42) and IMSB (predominately labels plaques containing A β 40) - were used for the studies. All these ligands showed distinct labeling in monkey brain sections. Antibodies for A β 40 and 42 confirmed the specific labeling of A β plaques and noted a general co-localization pattern of A β 40 and 42 plaques. These ligands also labeled A β plaques in Tg mouse brains with a strong, uniform signal, while human plaque labeling sensitivity varied with the radioiodinated ligands from case to case. **Conclusions:** Aged rhesus monkey brains do contain A β plaque deposition, which is detectable by radioiodinated ligands. However, the nature of the plaques may be different from and do not have the heterogeneity of human AD cases. Therefore, aged monkeys may be a potential Alzheimer’s animal model, but as with transgenic mice, the results may not be translated directly to AD in humans.

P2-189 COMPARISON OF FMRI ACTIVATION PATTERNS IN MILD COGNITIVE IMPAIRMENT (MCI) SUBJECTS AND ELDERLY CONTROLS AT ULTRA-HIGH FIELD STRENGTH

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Background: The MCI population represents a group of at-risk subjects who may have a prodromal form of AD. Analysis of functional brain activation differences in this population may aid in development of a technique for early diagnosis of AD. **Objective(s):** To assess differences in brain activation patterns between MCI subjects and elderly controls using fMRI at 4T during a memory encoding and retrieval task. **Methods:** Sixteen subjects (8 MCI, 8 controls) were studied during performance of a face-name memory encoding and retrieval task. The paradigm involved the presentation of novel face-name pairs and familiar face-name pairs within a blocked design. Statistical Parametric Mapping (SPM) random effects analysis using ANCOVA, with age as the covariate, was employed for comparison of the MCI group (5 male/3 female subjects, mean age 77.9, SD 6.1 years) and the control group (5 male/3 female subjects, mean age 74.5, SD 6.0 years). Volume of interest (VOI) analysis was carried out using a memory-specific VOI including the hippocampus, parahippocampal gyrus, entorhinal and perirhinal cortices, and an attention-specific VOI including the anterior cingulate gyrus, dorsolateral prefrontal cortex, and superior