IC-P-018 PREDICTION OF CEREBRAL AMYLOID POSITIVITY BASED ON NEUROPSYCHOLOGICAL TEST PERFORMANCE IN NON-DEMENTED ELDERLY INDIVIDUALS

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Background: Cerebral beta amyloid protein (Aβ) deposition is the core pathological hallmark of Alzheimer's disease (AD). Although amyloid PET imaging can be used to identify Aβ deposition human brains *in vivo*, it is still very expensive and cannot easily be available in many clinical settings. We aimed to find out neuropsychological tests or their combinations that could predict Aβ deposition status in non-demented elderly individuals. **Methods:** One hundred and eighty-two non-demented (149 cognitively normal and 33 amnestic mild cognitive impairment) elderly individuals (mean age 69.7 years, range 55-87) who participated in the Korean Brain Aging Study for Early Diagnosis & Prediction of Alzheimer's disease (KBASE), an ongoing prospective cohort study, were included. All subjects underwent comprehensive neuropsychological assessment and ^{11}C-labelled Pittsburgh Compound B positron emission tomography (PiB-PET). PiB-PET Images were classified as amyloid-positive if the mean ^{11}C-PiB retention value was over 1.21 in at least one of the four regions, which included the following: the frontal, lateral temporal, lateral parietal, precuneus/posterior cingulate cortices. **Results:** The Consortium to Establish a Registry for Alzheimer's Disease (CERAD) word list recall/recognition, the Rey Complex Figure Test (RCFT) 3-/30-minute delays, the Wechsler Memory Scale-IV (WMS-IV) logical memory (LM) immediate/delay/recognition, and the Wechsler Adult Intelligence Scale (WAIS-IV) block design (BD) test, which had significant mean differences between amyloid-positive and amyloid-negative groups, were initially selected. Thereafter, possible combinations of the tests were tested through a series of logistic regression analyses in order to determine the final composite test score with the highest prediction accuracy. The composite score calculated by the summation of WMS-IV LM delayed recall and WAIS-IV BD scores were finally selected. The prediction accuracy of the score for amyloid positivity was 72.5% in overall non-demented group and 78.5% in only cognitively normal subgroup. **Conclusions:** Our result suggests that the composite score calculated by summing the scores of WMS-IV LM delayed recall and WAIS-IV BD is useful for prediction of amyloid positivity in clinical practice for non-demented elderly.

IC-P-019 AMYLOID-INDEPENDENT ASSOCIATION OF NEUROTICISM TRAITS WITH REGIONAL CORTICAL THINNING IN COGNITIVELY NORMAL MIDDLE- AND OLD-AGED ADULTS

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Background: Previous studies have suggested that neuroticism, which is closely related to vulnerability to stress, increase the risk of Alzheimer's disease (AD). However, it is still unclear whether this relationship is directly mediated by AD-specific pathology, cerebral beta-amyloid (Aβ) deposition in particular. We aimed to investigate the associations of neuroticism traits with cerebral amyloid burden and regional cortical thickness in cognitively normal middle- and old-aged adults. **Methods:** Total 139 participants who were cognitively normal middle- and old-aged adults (mean age=68.9±7.8years: range = 55-87) from the Korean Brain Aging Study for Early Diagnosis & Prediction of Alzheimer's Disease (KBASE), an ongoing prospective cohort study, were included for analysis. All the subjects underwent comprehensive clinical and neuropsychological assessment, ^{11}C-labelled Pittsburgh Compound B (PiB) positron emission tomography (PET) and Magnetic Resonance Imaging, and blood sampling for ApoE genotyping. The NEO-Five Factor Inventory (NEO-FFI) with both self-report (neuroticism-S) and informant-report (neuroticism-I) were administered to participants and their informants to measure the neuroticism personality traits. Current depressive symptoms were measured using the Geriatric Depression Scale (GDS) and vascular risks were assessed as a vascular risk factor (VRF) score. Global cerebral Aβ deposition was defined as mean cortical PiB retention of the cortical regions including the frontal, lateral temporal, lateral parietal and precuneus/posterior cingulate cortices. Mean regional cortical thickness of the bilateral hemispheres based on Desikan-Killany atlas was measured using the FreeSurfer software. **Results:** There was no significant correlation between global or regional PiB retention and neuroticism-S and -I level. However, both neuroticism-S and -I were significantly associated with cortical thinning of the inferior parietal region even after controlling the effect of global PiB retention, ApoE4 carrier status, and VRF score as well as age, gender, education, GDS score. In addition, neuroticism-I was negatively correlated with cortical thickness of the posterior cingulate cortex and temporal regions including the inferior temporal and fusiform gyrus. **Conclusions:** Our results suggest that neuroticism traits itself may contribute to neuronal injury in the brain regions commonly involved in AD-type dementia, independently of cerebral Aβ deposition as well as vascular risks and current depression state in cognitively normal middle- and old-aged people.

IC-P-020 DIFFERENTIAL INFLUENCE OF SEX HORMONES, GONADOTROPINS, AND SEX HORMONE BINDING GLOBULIN ON BRAIN AMYLOID BURDEN BETWEEN MALE AND FEMALE IN COGNITIVELY NORMAL ELDERLY POPULATION

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Background: Although previous studies reported that sex hormones are associated with cognitive decline and increased risk for Alzheimer's disease in elderly population, few studies investigated

the association between sex hormones and brain beta amyloid protein (Aβ) deposition. In this study, we investigated the association between sex hormones and cerebral Aβ deposition in cognitively normal elderly population. **Methods:** Through the Korean Brain Aging Study for Early Diagnosis and Prediction of Alzheimer's Disease (KBASE), 117 cognitively normal elderly subjects (female 61, male 56) were included in this study. All the subjects underwent comprehensive clinical and neuropsychological assessment, 11C-labelled Pittsburgh Compound B (PiB) positron emission tomography (PET), and blood sampling. Global cerebral Aβ deposition was defined as mean cortical PiB retention of the cortical regions including the frontal, lateral temporal, lateral parietal and precuneus/posterior cingulate cortices. Plasma estradiol, testosterone, luteinizing hormone (LH), follicle stimulating hormone (FSH) and sex hormone binding globulin (SHBG) levels were measured. Calculated free estradiol and free testosterone index (FTI), which reflect the biologically active fraction of those hormones, were used for analyses. We performed Pearson's correlation and linear regression analysis across the whole cohort, and also performed the subgroup analyses in each gender. **Results:** For the entire subjects, we did not find any associations of sex hormones, gonadotropins, and SHBG with global PiB retention. However, subgroup analyses showed that FTI (β=-9.240, t=-2.92, p=0.005) and FSH (β=-0.128, t=-2.73, p=0.008) levels are associated with global PiB retention in female, while SHBG (β=0.187, t=2.75, p=0.008) level was related to global PiB retention in male. **Conclusions:** These findings suggest that there might be gender-specific differences in the way how sex hormones and gonadotropins affect cerebral Aβ deposition.

IC-P-021 IMPACT OF ^{18}F- FLORBETAPIR PET-CT ON CLINICAL DIAGNOSIS AND MANAGEMENT OF PATIENTS WITH POSSIBLE ALZHEIMER'S DISEASE

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Background: Amyloid imaging is a relatively new technique helping establish a diagnosis of Alzheimer's disease (AD). In the UK, the use of amyloid tracers is limited by the funding arrangements within the NHS. This study was aimed to evaluate the clinical impact of ^{18}F- Florbetapir-PET-CT on diagnosis and management of patients with high diagnostic uncertainty in community memory clinic. **Methods:** A retrospective analysis of 13 consecutive ^{18}F-Florbetapir-PET-CT studies was performed. Referrers were asked for an assessment of an impact on management, time between referral and diagnosis, the number of investigations performed during the diagnostic process, and whether any of them followed ^{18}F-Florbetapir-PET-CT. Impact was classified as (a) no impact (b) confirmed proposed management or (c) altered management. **Results:** 13 patients aged between 52-74 (mean 62.5) with unclear diagnosis underwent ^{18}F- Florbetapir-PET-CT imaging. The scan was positive for amyloid deposits in 9 out of 13 patients. Final diagnosis was AD in 9 patients, other diagnoses included frontotemporal dementia (FTDbv), traumatic encephalopathy, depression with anxiety and non-AD mild cognitive impairment (MCI). PET-CT scan had clinical impact in all cases by altering therapeutic management in 6 (46%) and confirming proposed management plan in the remaining 7 patients (53%). It was a conclusive investigation in 12 out of 13 cases. Only one person required further diagnostic tests after amyloid PET-CT (FDG-PET). The time from referral to diagnosis varied between 6 and 39 months, with the shorter intervals observed in more recently referred patients who had access to amyloid imaging. The number of the investigations, including structural imaging (MRI), FDG-PET, CSF analysis and neuropsychological assessment varied between 1 (usually MRI) to 5 (including sequential neuropsychological assessments). **Conclusions:** This data indicates ^{18}F- Florbetapir-PET-CT has a significant impact on the confidence of referring clinicians in all cases by altering therapeutic management in 46%, and confirming clinical impression in the others. Amyloid imaging can be a useful technique in diagnostically challenging cases where differential diagnosis includes AD in community memory clinic setting. The considerable cost of the scans may be offset by reducing the time from referral to diagnosis and the number of tests needed to confirm it.

IC-P-022 CONVERSION OF AMYLOID QUANTITATION WITH FLORBETAPIR SUVR TO THE CENTILOID SCALE

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Background: Klunk et al (2015) presented a method for standardization of quantitative amyloid imaging measures by scaling the outcome of each particular analysis method or tracer to the Centiloid scale. Herein we present our work converting florbetapir SUVr to the Centiloid scale. **Methods:** Florbetapir and PiB images were acquired 50-60 and 50-70 minutes post injection (respectively) for 46 subjects [13 young cognitively normal (YCN), 6 cognitively normal elder controls, 3 at-risk elderly, 7 MCI, 3 possible AD, and 14 AD] on two separate (18±20) days. SUVr values were calculated by previously published methods (Klunk et al, 2015; Joshi et al, 2015), which in turn were converted to Centiloids according to Klunk *et. al.* The first step was to validate our image registration

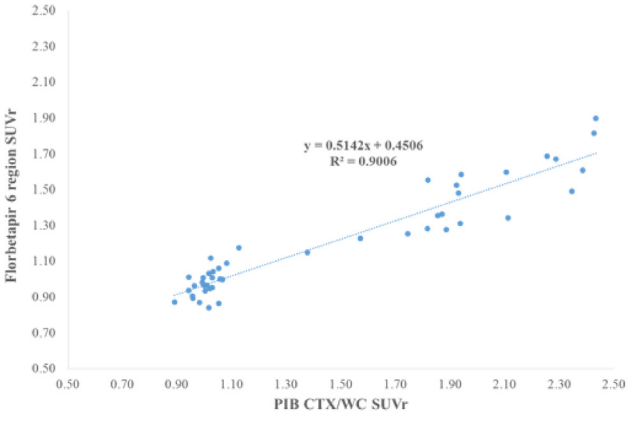

Figure 1a. SUVr for 46 subjects of mixed amyloid pathology who were scanned with both florbetapir and PiB.