AbstractID: 12616 Title: A comparison of F-18 FDG-PET imaging in differential diagnosis of Alzheimer's disease with parkinsonism and dementia with Lewy bodies disease

Purpose: Dementia with Lewy bodies (DLB) is the second most common cause of degenerative dementia after Alzheimer's disease (AD). The aim of this study was to investigate the diagnostic value of metabolism in the diagnosis of DLB and AD in comparison with [F-18]fluoro-2-deoxy-D-glucose(FDG)-PET imaging. Investigations which could help improve the accuracy of discrimination between DLB and AD would be a major advance.

Methods: All Subjects underwent ^{18}F-FDG-PET and MRI. We compared regional cerebral metabolic images by a voxel-by-voxel analysis with statistical parametric mapping (SPM) among DLBD, AD and NC subjects, and evaluated differences of hypometabolic regions. All PET scans be visually rated from equivalent slices, each image volume was registered to match a ^{18}F-FDG-PET template in standard MNI (Montreal Neurological Institute) space using statistical parametric mapping. Accurate normalization is essential for quantitative pattern analysis to neurodegenerative disease; the cerebellum or pons was often used as a reference region in the MR image, which assumed no significant regional influence of physiological fluctuations for quantitative.

Results: ^{18}F-FDG-PET revealed evidence of diffuse hypometabolism in both DLBD and AD with Parkinsonism marked declines in association cortices with relative sparing of subcortical structures and primary somatomotor cortex, a pattern reported previously in AD. Unlike AD, DLBD subjects also had hypometabolism in the occipital association cortex and primary visual cortex. Significant changes in hypometabolism in the volume of interest were assessed in the posterior cingulate gyrus, precuneus and parietal cortices. The severity of the decrease in metabolism in AD patients was significantly greater than in vascular dementia and frontotemporal dementia patients and controls.

Conclusion: These findings indicate the presence of diffuse cortical abnormalities in DLBD and suggest that FDG-PET may be useful in discriminating DLBD from AD.