AbstractID: 1121 Title: Cerebellum Normalization for the Mapping Analysis of the Alzheimer's Disease

In the Alzheimer-type dementia (ATD), the cerebellum is often used as a reference region, assuming that it is spared any major pathological involvement. Statistical parametric mapping (SPM) may enhance the evaluation of SPECT scans in ATD patients. 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. The aim of this study was to develop an easily applied, objective, and reproducible method for determining average cerebellar tracer uptake so that images can be scaled specifically to cerebellar activity prior to the performance of SPM analysis. Images were acquired using MR and ^{99m}Tc-ECD SPECT from fifteen patients (male/female: 9/6, 71.5±9.5years). Specific normalization was segmented to the cerebellum and applied to the original image with a scale factor (S.F), which determined one half of the cerebellum mean count (S.F = 50ml/dl/min / mean activity of the segmented cerebellum). The clinical application of the cerebellum normalization was applied to ATD and compared with the result of cerebellum normalization using global normalization. It shows that cerebellum normalization compensated for underestimation of the hypometabolic pattern. It was estimated that the cerebellum normalization technique was more accurate in normalization from the result of the normalization works using two different methods. A voxel-by-voxel analysis and anatomical standardization through the spatial normalization is used to overcome the limitations to underestimation of the hypometabolism in general analysis.