

ENTORHINAL CORTICAL VOLUME, A SENSITIVE IMAGING BIOMARKER IN SUBJECTIVE MEMORY IMPAIRMENT

Dong Won Yang¹, E. Lim¹, J. Cho¹, Y. Shim¹, B. Yoon², Y. Hong¹

¹Neurology, Catholic University of Korea, South Korea

²Neurology, Konyang University College of Medicine, South Korea

neuroman@catholic.ac.kr

Introduction: Subjective memory impairment (SMI) has been considered as a transitional state between normal and MCI and with higher conversion risk to dementia. The aim of this study was to investigate the diagnostic sensitivity of entorhinal cortical volume, hippocampal volume and fractional anisotropy (FA) in SMI.

Methods: We recruited 25 controls and 23 SMI. 3D T1 SPGR MRI and diffusion tensor image were obtained for the image analysis. Entorhinal cortical volume and hippocampal volume were measured by manual segmentation with Analyzer program. Entorhinal and hippocampal volume were divided by total intra cranial volume to correct size variation of brain. FA value was measured with ROI method at the head of hippocampus with Volume One program.

Results: Age, gender, education were not different between groups ($p > 0.05$). Mini-Mental State Examination score was lower in SMI group (28.3 VS 26.0, $p < 0.05$). Entorhinal cortical volume and FA value of hippocampus were lower in SMI group ($p < 0.001$). Hippocampal volume ratio was not different between groups (0.151% VS 0.148%, $p = 0.44$). Diagnostic accuracy of each of markers was evaluated with receiver operating characteristic curve. Area under the curve (AUC) value was highest in entorhinal cortical volume (AUC=0.939). AUC of the FA value of hippocampus were lower (AUC=0.867) and hippocampal volume had the lowest AUC value (AUC=0.533). Diagnostic accuracy of MMSE was higher than the hippocampal volume (AUC=0.769).

Conclusions: Structural changes start earlier in the entorhinal cortex than in the hippocampus of SMI. Measurement of entorhinal cortical volume may be a sensitive imaging biomarker for the early detection of SMI.