THE PREDICTION OF PROGRESSION TO ALZHEIMER'S DISEASE IN MILD COGNITIVE
IMPAIRMENT USING FUNCTIONAL NEUROIMAGING OF TC-99M HMPAO SPECT

K.W. Park¹, D.-Y. Kang², H.J. Yoon², B.C. Kim³, S. Kim⁴, J.W. Kim¹

¹Neurology, ²Nuclear Medicine, Dong-A University College of Medicine, Busan, ³Neurology, Chonnam National University Medical School, Kwangju, ⁴Neurology, Seoul National University Medical School, Seoul, Republic of Korea

Background & purpose: The aim of this study is to demonstrate the initial hypoperfusion areas using Tc-99m HMPAO SPECT in patient with converted MCI and to compare with the baseline cerebral hypoperfusion between converted MCI and non-converted MCI.

Materials and methods: We recruited 49 MCI patients according to the Petersen's criteria. All subjects underwent the brain MRI, detailed neuropsychological test and Tc-99m HMPAO SPECT between 2005 and 2007. Subjects were followed periodically through 1 or 2 years in order to monitor the progression to dementia status. We processed SPECT images with SPM8 software and performed a voxel-based statistical parametric mapping analysis. The SPECT data of the converted and non-converted MCI patients were compared with controls and then the converted MCI was compared with those of non-converted.

Results: Thirty nine out of 49 patients with MCI were included in our analysis. Nine patients were converted to AD, and 30 were not over 19 months of follow-up. As compared with controls, Converted MCI showed perfusion deficits in both parahippocampal gyri and right precuneus whereas non-converted MCI showed hypoperfusion in the left parahippocampal gyrus (uncorrected p< 0.01). Furthermore, the converted MCI patients showed hypoperfusion in both cingulate gyri and right precuneus compared with the non-converted MCI (uncorrected p< 0.01).

Conclusion: Cerebral hypoperfusion in the cingulate gyrus and precuneus in MCI patients appears as a correlate of conversion to AD. Our study suggests that initial hypoperfusion using brain SPECT in patients with MCI may be helpful in predicting who will convert to AD.