DIFFUSION TENSOR CHANGES ACCORDING TO AGE-AT-ONSET AND APOLIPOPROTEIN E GENOTYPE IN ALZHEIMER'S DISEASE

M.J. Kim[1], S.W. Seo[2], G.H. Kim[2], S.T. Kim[3], J.M. Kim[4], D.L. Na[2]

[1]Department of Neurology, Seoul National University Hospital Healthcare System Gangnam Center; [2]Department of Neurology and [3]Department of Radiology, Samsung Medical Center, Sungkyunkwan University School of Medicine and [4]Department of Biomedical Engineering, Hanyang University, Seoul, Republic of Korea

Introduction: Age-at-onset is one of the most important factors that affect clinical course of Alzheimer's disease (AD), and apolipoprotein E (apoE) genotype may also play important parts in determining the clinical phenotype. We aimed to investigate the change of white matter integrity according to age-at-onset and apoE genotype in AD using diffusion tensor imaging (DTI).

Methods: DTI was obtained in 72 patients with AD and 66 subjects with normal cognition (NC), and apoE genotype was available in 48 patients with AD. Multiple regression analysis was conducted including the interaction of age-at-onset (or current age in the NC group) and group difference as one of the independent variables, and fractional anisotropy (FA) and mean diffusivity (MD) values as the dependent variables in all subjects. In order to assess the effect of apoE, 48 AD patients whose apoE genotypes were available were divided into two groups according to e4 allele positivity, and each group was analyzed with the NC group using the similar method as above.

Results: Without consideration of apoE genotype, younger age-at-onset was associated with lower FA and higher MD in the cingulum and froto-temporo-parietal association fibers. When the data were analyzed individually in e4 carriers and non-carriers, the carriers showed correlation between younger age-at-onset and both of the cingulum and association fibers while the non-carriers showed correlation with only association fibers.

Conclusion: Our results suggest that characteristic topographical distribution of pathological changes in patients with AD is determined by not only age-at-onset but also by apoE genotype.