Oral PO-2 *(09:10 - 09:20)*

Age-related reductions of perfusion and diffusion by a 4T MRI

장건호[1], N Schuff[2], Y Zhang[2], AT Du[2], S Mueller[2], M.W. Weiner[2]
경희대학교 의과대학 동서신의학병원 방사선학과[1]
Department of Radiology, University of California-San Francisco, CA, USA[2]

목적: The goals of this study were: 1) to determine the regional pattern of age-related CBF reduction and its concordance and dissociation with regional brain tissue loss and 2) to characterize the regional pattern of age-related alterations of white matter fibers, expressed in terms of diffusion fractional anisotropy (FA) and mean diffusivity (D).

대상 및 방법: Twenty-nine men and 22 women were included in the study. MRI data were obtained on a 4.0 T Bruker/Siemens Medspec™ System, equipped with an 8-channel receiver head coil. Scans included: MPRAGE, T1-weighted. Continuous arterial spin labeling EPI (5); TR/TE = 5200/9ms, 1600ms post-labeling delay, 5.0 x 3.8mm in-plane resolution, 16 slices each 5mm thick; Diffusion tensor imaging (DTI), TR/TE = 6000/77ms, b = 800 s/mm2, 6 directions, 2 x 2 mm2 in-plane resolution, 40 slices each 3 mm thick. Image processing and statistical analyses were performed within the framework of SPM2.

결과: *Gray matter and CBF alterations:* Age-related loss occurred predominantly ($p < 0.001$) in left and right superior temporal cortex, while reduced CBF involved primarily ($p < 0.001$) superior parietal cortex, including the posterior cingulate gyrus and precuneus. No regions with significant concordance or dissociation between age-related gray matter loss and CBF reduction were found.

White matter alterations: The most prominent ($p < 0.0001$) reduction of FA involved left and right frontal white matter, the genu of the corpus callosum, the left and right external capsule, and the thalamus. The most prominent ($p < 0.0001$) increase of D involved white matter fibers in all major lobes, also in the cingulum, thalamus, and the internal and external capsule.

결론: The gray matter volumes and CBF findings indicate substantial involvement of parietal brain regions in normal aging, a region that is also strongly impacted by AD. In contrast the alterations in the cortex, age-related alterations of white matter fibers involved predominantly the frontal lobe. The findings indicate that aging is associated with broad regional alterations of gray and white matter.