**Poster PE-2**

# Improved ASL perfusion method to measure white matter perfusion at a 4 Tesla MRI

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

**목적:** The overall goal of this study was to improve CBF measurements in white matter by developing ASL-MRI that is less sensitivity to R2*, immune to magnetization transfer and minimizes background noise. Specifically, the objectives were 1) to develop pulsed ASL which maintains equilibrium of stationary spins in both labeled and unlabled scans while compensating for MT and providing multislice imaging capabilities and 2) to combine the proposed ASL method with Turbo-Flash (TFL) to reduce signal loss due to R2* and 3) to compare the sensitivity of Turbo-FLASH (TFL) and EPI acquisitions to measure CBF in gray matter and white matter at a high magnetic field.

**대상 및 방법:** In the proposed ASL method, stationary spins in an imaging plane are kept at equilibrium to avoid noise due to T1 relaxation, while blood water is labeled using in-plane double inversion. The proposed method was tested on five subjects and compared with existing ASL MRI methods at a 1.5 Tesla MRI to show improvement and was tested on additional 7 subjects using echo-planar imaging (EPI) and Turbo-Flash (TFL) acquisitions using various post-labeling delay times to test feasibility to measure WM CBF at a 4 Tesla MRI. WM and gray matter (GM) CBF maps were obtained and analyzed within the statistical parametric mapping (SPM) tool.

**결과:** CBF measurements with the proposed method were less confounded by magnetization transfer effects and less dependent on blood velocity than the existing methods studied at the 1.5T MRI. Furthermore, the proposed method yielded excellent gray/white contrast of CBF maps. TFL acquisitions achieved more stable CBF measurements than EPI in various brain regions.

**결론:** The proposed ASL method improved CBF imaging at 1.5T and 4.0T and accomplished to measure CBF of WM at 4T. Therefore, the proposed method should improve accuracy in measuring regional CBF.