M-I-4 *(11:30~11:40)*

Combined BOLD fMRI and Transcranial Magnetic Stimulation Study: Evaluation of Ipsilateral Motor Pathway of Stroke Patients

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목적 : In this study, we investigated the possible motor pathways of hemiplegic stroke patients usin combined TMS and BOLD fMRI approach and evaluated the correlation between TMS a fMRI methods.

대상 및 방법 : Four subjects, who demonstrated left hemiplegia after stroke, are included. TMS was performed using a Dantec Mag2 stimulator (Dantec Company, USA) in single puls mode with figure eight-shaped coil. Following TMS localization, The BOLD T2*-weight images were acquired with echo planar imaging sequence (TR = 1.2 sec, TE = 60 msec, and flip angle = 90). Motor activation was studied by means of a repetitive fing flexion-extension task. The stimulation protocol comprised 10 cycles of alternating activati and rest (10 images per cycle). Total 60 cycles were performed and each cycle take abou 1.5 sec. The resulting images were then analyzed with STIMULATE (CMRR, U. o Minnesota) to generate functional maps using a student t-test ($p < 0.0005$) and cluste analysis.

결과 : For hemiplegic left finger task, it was found from fMRI that primary motor areas on bot right and left hemispheres showed activation. For a hemiplegic left APB muscle, TMS revea that there were two ipsilateral MEPs on the left hemisphere and one contralateral MEP o the right hemisphere. The TMS results therefore suggest that both contralateral and ipsilater motor pathways are involved in hemiplegic left hand. Since TMS has been known to ha very high functional specificity, our TMS findings strongly support the ipsilateral mo activation of affected left hand found with fMRI. Therefore, our results using TMS and fM clearly indicate ipsilateral motor pathway for hemiplegic left hand in addition to contralate pathway in all patients and a strong correlation between two techniques for brain mapping.

결론 : Combining the anatomical accuracy of fMRI with the functional specificity of TMS will lik constitute a useful brain mapping methodology for more accurate investigation of involv motor pathways in patients of brain injury.