뇌신경재활

게시일시 및 장소 : 10 월 18 일(금) 13:15-18:00 Room G(3F)

질의응답 일시 및 장소 : 10 월 18 일(금) 15:45-16:30 Room G(3F)

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A Comparison of Factors Predicting Recovery for Upper and Lower Extremities after Ischemic Stroke

Jungsoo Lee[1,2*], Ahee Lee[2], Heegoo Kim[2], Jinuk Kim[2], Won Hyuk Chang[1], Yun-Hee Kim[1,2†]

Samsung Medical Center, Department of Physical and Rehabilitation Medicine, Center for Prevention and Rehabilitation, Heart Vascular Stroke Institute[1], Sungkyunkwan University, Department of Health Sciences and Technology, Department of Medical Device Management & Research, Department of Digital Health, SAIHST[2]

Objective

Stroke is a highly heterogeneous disorder and therefore the patients show diverse recovery patterns. Understanding recovery mechanism and predicting recovery pattern are important to make individually-tailored rehabilitation plans in the clinic. In case of recovery of upper extremity (UE) after stroke, many clinical and neuroimaging studies were investigated and many predictive factors including neuroimaging factors were also reported. However, study related to recovery of lower extremity (LE) after stroke is not enough. In addition, a comparison study of recovery for UE and LE is rare. In this study, we investigated and compared factors predicting recovery for UE and LE after stroke using patient characteristics and neuroimaging data.

Materials and Methods

Forty-two subacute ischemic stroke patients (24 males, mean age 57.2±12.4 years) participated. All patients underwent T1, DTI and re-fMRI data acquisition, and cognitive and behavioral assessments at two weeks after stroke onset. Motor function of UE and LE was measured using the Fugl-Meyer assessment (FMA) and cognitive function was measured using the mini-mental state examination (MMSE). Motor function was assessed again at three months after stroke onset. The NIH stroke scale (NIHSS) was measured to quantify initial stroke severity. Important neuroimaging markers in motor recovery after stroke were investigated. Corticospinal tract (CST) fractional anisotropy (FA) was extracted from DTI data, and lesion volume and lesion load of the CST were extracted from anatomical data. Interhemispheric homotopic functional connectivity was extracted from rs-fMRI data. A normalized difference value between MMSE and FMA scores (diff(MMSE, FMA)) was used as an additional factor. A linear regression model was used to investigate relationships between factors and motor recovery (FMA improvement for three months).

Results

UE and LE recovery-related factors and their predictive power were noticeably different. NIHSS score, lesion load of the CST, lesion volume, and interhemispheric homotopic

functional connectivity were related to UE recovery only. Age, MMSE, diff(MMSE, FMA) and ipsilesional CST FA were predictive factors in UE and LE recovery while contralesional CST FA was related to LE recovery only. Age and diff(MMSE, FMA) showed higher predictive power in LE recovery compared to UE recovery.

Conclusions

Many clinical and neuroimaging markers were predictive factors in UE recovery, which were in line with previous clinical and neuroimaging studies. However, most of these factors were not related to LE recovery. LE recovery was strongly related to age and cognitive function, furthermore, it had a relationship with contralesional CST integrity. These results may indicate that recovery mechanism of UE and LE after stroke is different. Involvement of age, cognitive functions, and unaffected tract is rather crucial for LE recovery after stroke.

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