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)

**P 2-64**

# Establishment of kinematic measures for arm impairments in stroke patients using a planar device

Hyungsun Peo[1*], Yeongchang Jo[1], Dokyeong Ha[2], Hyoseok Yi[2], Dongseok Yang[2], Si Hyun Kang[1], Don-Kyu Kim[1], Kyung Mook Seo[1], Jaewon Beom[1†]

Chung-Ang University Hospital, Chung-Ang University College of Medicine, Department of Physical Medicine and Rehabilitation[1], Neofect, Data Science & Rehab Research Team[2]

**Objective**
To establish kinematic measures for upper-limb functional impairments in stroke patients using a 2-dimensional planar device.

**Methods**
Subacute and chronic stroke patients with hemiparetic arm in Brunnstrom 3, 4, or 5 stage were enrolled. Hemiparetic arm function was evaluated and trained with 3 kinds of tasks (free exploration, point-to-point reaching, and round shape drawing) using the RAPAEL Smart BoardTM (Neofect). The device has 2-dimensional planar board and position sensors. The 12 kinematic measures were included as follows: the covered area, normalized jerk, zero crossings in acceleration, mean arrest period rate, mean and maximum velocity, time to velocity peak, reaction time, duration time, hand path ratio, bias, and variability.

**Results**
The quality of database was certified for kinematic measures, demographic data, and clinical scales such as Fugl-Meyer assessment scale, box and block test, and Pegboard test. Processing metrics for 12 kinematic measures were developed, and raw kinematic data for x- and y-axis could be analyzed by Python program. In free exploration task, hemispatial neglect could be assessed quantitatively, and the covered area was positively correlated with Fugl-Meyer assessment scale in patients with severely impaired arm function.

**Conclusion**
Quantitative and sensitive kinematic variables are needed to evaluate upper-limb functional impairments in stroke patients. The study results can be further applied to patients classification and kinematic biomarkers investigation for prognostication of functional arm recovery.