

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 2-90**

### **Cortical activation during gait, motor imagery, observation, robot-assisted gait, and gait together**

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#### **Objective**

The aim of this study was to investigate cortical activation for five conditions of gait, such as actual gait (AG), motor imagery of gait (MI), observation of one's gait (OG), robot-assisted gait (RG), and gait together (GT) in healthy adults.

#### **Method**

Ten healthy subjects (4 males and 6 females, mean age  $28.6 \pm 3.6$ ) with no history of neurological or physical impairment participated in this study. We used 31-channel functional near-infrared spectroscopy system (LABNIRS, Shimadzu corp., Kyoto, Japan), and used block-design protocol while performing AG, MI, OG, RG, and GT. The speed of the AG was self-selected comfortable speed. Subjects were instructed to imaging of walking activity from an internal perspective during MI. For OG, subjects observed the video recording their one's gait. For RG, subjects underwent robot-assisted gait (G-EO System Evolution, Reha Technology, Olten, Switzerland). Subjects were instructed to walk along the other person walking in front of them during GT. We measured values of oxy-hemoglobin in area of  $12 \times 9$  cm including primary sensorimotor cortex (SMC), premotor cortex (PMC), supplementary motor area (SMA), pre-supplementary motor area (pre-SMA), and prefrontal cortex (PFC). In order to investigate the activity of cortical areas,  $\Delta$ oxyHb was measured as the difference in oxyHb between task and rest phases in each channel. For comparison of task and region, this study used one-way repeated measures analysis of variance with task and region respectively.

#### **Results**

In the SMC, there were no significant differences between the activities during the five gait tasks. In the SMA, the activity during MI was significantly higher than that during the other four gait tasks ( $p < 0.05$ ). In the task of watching the one's gait in a third party perspective, such as OG and GT, the activity of SMA was the lowest, while the activity of PFC was the highest ( $p < 0.05$ ). During the RG, the SMC showed the highest activity than the other areas ( $p < 0.05$ ).

**Conclusion**

It is meaningful to compare cortical activity during the five tasks. This may be used as a basic data on the mechanism of gait rehabilitation of stroke patients. Future studies will be needed for more subjects and should be extended to study in patients with stroke.

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