

研究業績 英文表記

| 和文 | |
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| 表題 | 運動イメージ課題中の脳血流動態変化と運動課題における学習程度に関連 |
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| 英文 | |
| Title | Hemodynamic Signal Changes During Motor Imagery Task Performance Are Associated With the Degree of Motor Task Learning |
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| Abstract | <p>Purpose: This study aimed to investigate whether oxygenated hemoglobin (oxy-Hb) generated during a motor imagery (MI) task is associated with the motor learning level of the task. Methods: We included 16 right-handed healthy participants who were trained to perform a ball rotation (BR) task. Hemodynamic brain activity was measured using near-infrared spectroscopy to monitor changes in oxy-Hb concentration during the BR MI task. The experimental protocol used a block design, and measurements were performed three times before and after the initial training of the BR task as well as after the final training. The BR count during training was also measured. Furthermore, subjective vividness of MI was evaluated three times after NIRS measurement using the Visual Analog Scale (VAS). Results: The results showed that the number of BRs increased significantly with training ($P < 0.001$). VAS scores also improved with training ($P < 0.001$). Furthermore, oxy-Hb concentration and the region of interest (ROI) showed a main effect ($P = 0.001$). An interaction was confirmed ($P < 0.001$), and it was ascertained that the change in oxy-Hb concentrations due to training was different for each ROI. The most significant predictor of subjective MI vividness was supplementary motor area (SMA) oxy-Hb concentration (coefficient = 0.365). Discussion: Hemodynamic brain activity during MI tasks may be correlated with task motor learning levels, since significant changes in oxy-Hb concentrations were observed following initial and final training in the SMA. In particular, hemodynamic brain activity in the SMA was suggested to reflect the MI vividness of participants.</p> |
| keyword | motor imagery, motor learning, oxygenated hemoglobin, ball rotation task, motor area |

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