

平成20年度 博士後期課程学位論文要旨

学位論文題名 (注: 学位論文題名が欧文の場合は和訳をつけること)

A comparison of three bimanual coordinations: an fMRI study.

3種類の両手動作における脳内神経活動の比較－機能的MRIによる分析－

学位の種類: 博士(理学療法学)

人間健康科学研究科 博士後期課程 人間健康科学専攻 理学療法科学系

学修番号 06995603

氏名: 松田 雅弘

(指導教員名: 渡邊 修)

注: 1,000字程度(欧文の場合300ワード程度)で、本様式1枚(A4版)に収めること

[Purpose] Post-stroke treatment regimens include symmetrical movement, reciprocal movement and alternating movement which may be performed accordingly as the patients progress. However, as far as the authors know, there are no reports regarding the differences in neural circuitry involved in each movement. [Subjects and Methods] We analyzed the brain activity of 23 right-handed healthy subjects when performing three different bimanual movements using functional magnetic resonance imaging (fMRI). [Results] Performance of the bimanual tasks showed significant bilateral activation in the sensorimotor area (SMC) under all 3 conditions, the lowest increase in activation was under the alternating condition, with more activation in the right SMC than in the left. Bilateral supplementary motor area (SMA) activated during performance under all 3 conditions. In particular, under alternating condition, significant increase of activation was observed in bilateral SMA. Bilateral premotor area and thalamus were activated, significant increases in activation were observed in the right hemisphere. Bilateral cerebellum showed activation under symmetrical and alternating conditions but not under the condition of reciprocal hand grasps, significant increases in activation were observed in the right. [Conclusion] Moreover, analysis of the brain activity associated with the three bimanual movements suggested involvement of different circuits of subcortical nerve base structures, respective to the tasks. It is considered that the findings may be used as reference data concerning which of the bilateral movements should be employed in rehabilitation according to the brain injury.