

Department of Rehabilitation Medicine

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General Summary

The main research topics of our department are as follows: (1) investigation of the effects of repetitive transcranial magnetic stimulation (rTMS) on N-methyl-d-aspartate receptor (NMDAR)-associated amino acids, (2) association between recovery of upper limb paralysis in patients after stroke and an interhemispheric imbalance in cortical brain activity, (3) whether a 2-minute spontaneous swallowing frequency measurement can make predictions about the need for tube feeding for dysphagia.

Research Activities

Investigation of the effects of rTMS on NMDAR-associated amino acids

The rTMS improves depressive symptoms and motor function in stroke patients. While metabolic derangement of the kynurenine pathway has been reported in stroke patients, the effect of rTMS on this pathway remains unknown. The aim of this study was to investigate the effects of rTMS on NMDAR-related amino acids in serum of patients after stroke. The results suggest that rTMS can modulate NMDAR-related amino acids in blood and produce beneficial effects.

Association between recovery of upper limb paralysis in stroke patients and an interhemispheric imbalance in cortical brain activity

This study was designed to determine the association between motor functional recovery and interhemispheric imbalance in cortical brain activity in patients with subcortical stroke and moderate-to-severe upper limb hemiparesis admitted to the convalescent rehabilitation ward. Our results suggest that activation of the nonlesional hemisphere in subacute stroke is associated with motor recovery in moderate-to-severe upper limb hemiparesis. A multidisciplinary rehabilitation of patients with moderate-to-severe upper limb hemiparesis after stroke might enhance the compensatory movements and pre-existing motor network from the nonlesional motor cortex.

Whether a 2-minute spontaneous swallowing frequency measurement can make predictions about the need for tube feeding for dysphagia

The present study investigated whether measuring the frequency of spontaneous swallowing for 2 minutes can predict independence on enteral feeding 1 week after admission in patients with acute stroke. The results suggest that the 2-minute spontaneous swallowing

screening predicts independence on enteral feeding 1 week after admission in patients with acute stroke.

Publications

Hamaguchi T, Abo M, Murata K, Kenmoku M, Yoshizawa I, Ishikawa A, Suzuki M, Nakaya N, Taguchi K. Association of Long-Term Treatment by Botulinum Neurotoxins and Occupational Therapy with Subjective Physical Status in Patients with Post-Stroke Hemiplegia. *Toxins (Basel)*. 2019 Aug 2; **11**(8): 453. doi: 10.3390/toxins11080453. PMID: 31382438; PMCID: PMC6723584.

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