

Department of Rehabilitation Medicine

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General Summary

The main research topics of our department are as follows: 1) effect of repetitive transcranial magnetic stimulation (rTMS), 2) dysphagia, 3) treatment for stroke, 4) analysis based on database.

Research Activities

Effect of rTMS

1. Combination protocol of low-frequency rTMS and intensive occupational therapy (iOT) for post-stroke upper limb hemiparesis: a 6-year experience of more than 1,700 Japanese patients

Our proposed combination protocol of rTMS and iOT for upper limb hemiparesis was proved a safe and useful therapeutic intervention by a result of a multi-institutional study on a total of 1,725 post-stroke patients.

2. Does a combined intervention program of rTMS and iOT affect cognitive function in patients with post-stroke upper limb hemiparesis?

We retrospectively investigated whether the combined treatment of rTMS and iOT influenced patient's cognitive function. Twenty-five patients received the treatment. Only patients with right-sided hemiparesis exhibited improved Trail-Making Test part B performance.

3. The effect of selective rTMS with functional near-infrared spectroscopy (fNIRS) and intensive speech therapy (iST) on individuals with post-stroke aphasia

The administration of fNIRS-guided selective rTMS therapy and iST to eight right-handed post-stroke patients with aphasia induced a significant improvement in language function.

4. High-frequency rTMS on leg motor area in the early phase of stroke

Twenty-one patients with a hemispheric stroke lesion in the early phase were randomly assigned into two groups: the high-frequency (HF)-rTMS group and the sham stimulation group. The improvement in Brunnstrom Recovery Stages for the lower limbs was significant after the intervention in the HF-rTMS group.

5. High-frequency rTMS for the treatment of chronic fatigue syndrome: a case series

We consecutively applied facilitatory high-frequency rTMS to the dorsolateral prefrontal cortex of seven chronic fatigue syndrome patients over three days. In most of the patients,

treatment resulted in an improvement of fatigue symptoms.

Dysphagia

1. Influence of repetitive peripheral magnetic stimulation on neural plasticity in the motor cortex related to swallowing

The results indicated that repetitive peripheral magnetic stimulation increased motor-evoked potential amplitude of swallowing muscles, suggesting facilitation of the motor cortex related to swallowing in healthy individuals.

2. Noninvasive brain stimulation for dysphagia after acquired brain injury: a systematic review

The review provided low-quality evidence for the effectiveness of noninvasive brain stimulation including rTMS and transcranial direct current stimulation in improving dysphagia after acquired brain injury.

Treatment for stroke

1. Atomoxetine administration combined with iST for post-stroke aphasia: evaluation by a novel SPECT method

Atomoxetine administration combined with iST were safe and feasible for post-stroke aphasia. Four patients showed improved language function and their cortical blood flow surrounding lesioned brain areas was found to increase following intervention.

2. Effect of home-based training using a slant board with dorsiflexed ankles on walking function in post-stroke hemiparetic patients

This home-based rehabilitation program using the slant board was safe and improved walking function in post-stroke hemiparetic patients. Six patients showed increased walking velocity, decreased the number of steps in the 10-m walking test, and decreased Timed “Up and Go” test performance time.

Analysis based on database

1. Predictive factors for oral intake after aspiration pneumonia in older adults

We clarified prognostic factors for total oral intake in elderly aspiration pneumonia patients. Early initiation of total oral intake was associated with female sex and higher Barthel Index. Delayed initiation of total oral intake was associated with underweight, higher scores of pneumonia severity and comorbidities.

2. Proton pump inhibitors (PPIs) versus histamine-2 receptor antagonists (H2RAs) and risk of pneumonia in patients with acute stroke

These data demonstrated that no significant difference in the incidence of pneumonia was seen between users of PPIs and H2RAs after acute stroke.

3. Impact of board-certificated physiatrists on rehabilitation outcomes in elderly patients after hip fracture: An observational study using the Japan Rehabilitation Database

These data suggest that the participation of board-certificated physiatrists is associated with good rehabilitation outcomes in patients with hip fracture at convalescent rehabilitation wards.

Others

1. Comparison of functional outcome between lacunar infarction (LI) and branch atheromatous disease (BAD) in lenticulostriate artery territory

These data demonstrated that BAD patients can obtain activities of daily living similar to LI patients. However, many BAD patients require canes and/or orthoses.

2. Validation of the “activity and participation” component of the International Classification of Functioning, Disability and Health (ICF) Core Sets for stroke patients in Japanese rehabilitation wards

The “d” component of these 2 ICF Core Sets reflected functional status and disability. They could be a valid measure in post-acute stroke patients in the rehabilitation setting.

Publications

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