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Mental practice with motor imagery in gait rehabilitation following stroke: A randomized controlled trial

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Keywords: Stroke; Mental practice; Motor imagery ability; Gait rehabilitation
Introduction.– Recently, mental practice with motor imagery has been increasingly recommended for use in rehabilitation programs following stroke. It has been found effective in improving arm function after stroke [3]. So far, few studies examined the potential effect of mental practice on lower limb function.

In this study, we first wanted to evaluate if motor imagery ability is preserved after stroke. Secondly, we wanted to examine if mental practice in combination with physical practice is beneficial in improving gait function after stroke.
Subjects and methods.– Forty-four subjects with gait dysfunction after a first time stroke, were randomly allocated to a MI (intervention) group ($n = 21$) and a muscle relaxation (control) group ($n = 23$). All participants received a standard gait rehabilitation program. Additionally, the motor imagery group received 30 minutes mental practice; the control group received in the same amount of therapist interaction progressive muscle relaxation.

Motor imagery ability was measured using the MIQ-RS [2] and a mental chronometry test [1]. The lower limb function was evaluated using a 10 m test, gait velocity and the Fugl Meyer scale.
Results.– The present findings indicate that patients with stroke have a preserved motor imagery ability.

All outcome measures of lower limb function improved after 6 weeks of training regardless of the used regimen. A significant group interaction was seen for the results of the 10 m test and MIQ$_{kin}$.

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Effect of a robotic kinematic constraint on hemiparetics gait. Randomized controlled study

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Keywords: Stroke; Lokomat®; Restraint; Asymmetry; Gait training; Biomechanical gait parameters
Background.– To date no study has assessed effects of a robotic-assisted gait training on the kinematic and kinetic gait parameters in hemiparetic patients. Constraint therapy seems an interesting approach in the stroke patients rehabilitation. A robotic constraint gait training would be an innovative paradigm in stroke patients.
Objective.– To compare a new Lokomat® asymmetric restraint paradigm (with a negative kinematic constraint on the non-paretic limb and a positive kinematic constraint on the paretic limb) with a conventional symmetrical Lokomat® training in hemiparetic subjects.
Methods.– Twenty-six hemiparetic subjects were randomized to one of two groups Lokomat® experimental gait training (LE) or Lokomat® conventional gait training (LC). They were assessed using 3D gait analysis before, immediately after the 20 minutes of gait training and following a 20 minute rest period.
Results.– There was a greater increase in peak knee flexion on the paretic side following LE than LC ($P = 0.04$) and each type of training induced different changes in vertical GRF during single support phase on the paretic side. Several other spatio-temporal, kinematic and kinetic gait parameters were improved after both types of training.
Discussion and conclusion.– Lokomat® restrained gait training with a negative kinematic constraint on the paretic limb and a positive kinematic constraint on the non-paretic limb appears to be an effective approach to specifically improve knee flexion in the paretic lower limb in hemiparetic patients. This study highlights also spatio-temporal, kinematic and kinetic improvements after Lokomat® training, in hemiparetic subjects, rarely investigated before.

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Evaluation of the quality of sleep in patients with stroke

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Keywords: Sleep disorders; Stroke; Sleep apnea
Aims of the study.– Assessing the quality of sleep of a population of patients suffering from ischemic stroke.
Patients et methods.– Prospective study conducted from December 2012 to March 2013. The data studied were epidemiological and clinical. The assessment of the anxio-depressive profile was made by "The Hospital Anxiety and Depression Scale" (HADS) and the quality of life (QOL) was evaluated by "The Short Form 12" (SF12). Sleep quality was assessed using the Epworth Sleepiness Scale, the Pittsburgh sleep quality index (PSQI) and a polygraphic recording.
Results.– We recruited 22 patients, with a mean age of 54.2 years $\pm$ 10 years. The sex ratio M/F was 2.6. Of these patients, 77.3% had at least one cardiovascular risk factor and 59.1% had 2 risk factors or more. The majority of our patients (95.4%) were hemiparetic. The left hand side was affected in 54.5% of cases. All the patients were anxious and/or depressed (HAD-Anxiety average: 11.5 ± 2.9 and HAD-Depression average: 11.3 ± 3.3). Concerning the QOL, the SF12 physical component score was 33.9 ± 4.3 and the mental component score was 37.3 ± 10.9. The Epworth score average was 8.8 ± 4.4, considered high enough to require a polygraphic recording, the average PSQI was 7.6 ± 3.2. Impaired Epworth score was significantly associated with HAD-Anxiety score ($r = 0.4$, $P = 0.05$). A high PSQI was significantly correlated with age ($r = 0.45$, $P = 0.03$) and HAD-Anxiety score ($r = 0.65$, $P = 0.001$). Sleep apnea was confirmed in 18% of cases.
Discussion.– The relationship between sleep disorders and stroke is already established. Excessive daytime sleepiness caused by sleep apnea or fatigue caused by insomnia have major impact on the patient's ability to perform rehabilitation program. Screening for these disorders is important to preserve the vital prognosis (secondary stroke prevention) and to improve the functional prognosis.

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Guided self-rehabilitation contracts and gait speed in chronic hemiparesis. A prospective study

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Keywords: Spastic Paresis; Guided Self-Rehabilitation Contracts; Walking speed
Background.– Conventional physical therapy (CPT) has no meaningful impact on walking speed beyond 9 months after stroke. For patients with adequate