Facilitation of interlimb transfer of a visuomotor skill using somatosensory stimulation

Published: 04-03-2014
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To determine if SS improves motor learning and transfer of a visuomotor task.

Ethical review	Approved WMO
Status	Recruitment stopped
Health condition type	Other condition
Study type	Interventional

Summary

ID

NL-OMON40153

Source
ToetsingOnline

Brief title
motor learning and somatosensory stimulation

Condition

- Other condition

Synonym
Stroke

Health condition

Herseninfarct

Research involving
Human

Sponsors and support

Primary sponsor: Universitair Medisch Centrum Groningen
Source(s) of monetary or material Support: Ministerie van OC&W

Intervention

Keyword: cross-education, motor learning, somatosensory stimulation, transcranial magnetic stimulation (TMS)

Outcome measures

Primary outcome

Main outcome measure is the error in matching a template during VMP in the left

and right hand.

Secondary outcome

Mechanistic measures include the corticospinal excitability indexed by the size

of the motor evoked potentials (MEPs) produced by transcranial magnetic

stimulation (TMS), short-interval intracortical inhibition (SICI),

intracortical facilitation (ICF), ipsilateral silent period (iSP) and

contralateral facilitation (CLF).

Study description

Background summary

Afferent stimulation modulate motor output. Here we examine the possibility that somatosensory stimulation (SS) can enhance motor learning and the transfer to the non-exercising limb. The transfer effects are relevant because patients with unilateral impairments (e.g. stroke patients, wrist fractures) can benefit from training the intact side of the body but this cross-education effect (XED) is relatively small, 10%. Based on evidence from the literature, we hypothesize that SS enhances the direct and crossed effects of training. The main task comprises a complex visuomotor task performed with the right hand of right hand dominant healthy volunteers and SS is supplemented during the motor practice in

the form of gentle, percutaneous electrical stimulation.

Study objective

To determine if SS improves motor learning and transfer of a visuomotor task.

Study design

We will use acute (single session) and chronic (multiple sessions) visuomotor practice (VMP) as an intervention and no-intervention as a control in a pre-test post-test and a follow-up design.

Intervention

Non-invasive visuomotor training with the right wrist flexors and extensors during a 25 minute session. Before, during or after VMP SS at 1Hz with an intensity of two times perceptual threshold will be applied to either the resting hand or the training hand.

Study burden and risks

Subjects report for the experiments to the Center for Human Movement Sciences. In session one, subjects are familiarized with the experimental equipment and procedures for about one and a half hour. Testing sessions last about 1.5 hour and training sessions last about 30 minutes. Testing involves performance in the visuomotor task and responses to TMS in the seated position. Training sessions involve practice of the visuomotor task. TMS may cause slight discomfort lasting less than a second on the scalp near the coil. It may also cause some twitching of the muscles, the face and jaw, which may be unpleasant and surprising but not painful. Peripheral muscle stimulation will be below motor threshold, and can be more surprising than painful. It can cause some momentary burning and tingling sensation. There are no known long-term risks of peripheral muscle or magnetic brain stimulation.

Contacts

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Trial sites

Listed location countries

Netherlands

Eligibility criteria

Age
Adults (18-64 years)
Elderly (65 years and older)

Inclusion criteria

Age 18-30 years, female or male gender, right handed

Exclusion criteria

Fracture in the upper extremity over the past year, neurological disorders, pregnancy, medicine known to affect nerve conduction, Epilepsy, Pacemaker, metal in the brain/skull.

Study design

Design

Study type:	Interventional
Intervention model:	Parallel
Allocation:	Randomized controlled trial
Masking:	Single blinded (masking used)

Primary purpose: Treatment

Recruitment

NL

Recruitment status:	Recruitment stopped
Start date (anticipated):	01-09-2014
Enrollment:	108
Type:	Actual

Ethics review

Approved WMO

Date:	04-03-2014
Application type:	First submission
Review commission:	METC Universitair Medisch Centrum Groningen (Groningen)

Study registrations

Followed up by the following (possibly more current) registration

No registrations found.

Other (possibly less up-to-date) registrations in this register

ID: 29210
Source: Nationaal Trial Register
Title:

In other registers

Register	ID
CCMO	NL46387.042.13
OMON	NL-OMON29210