Influence of changes in brain activity during movement observation and execution on the recovery of motor function after stroke.

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The objective of the study is to examine the relation between changes in cortical activity during movement observation and execution, and changes in motor function and motor control after stroke. The hypotheses to study this objective are: 1. Brain...

Ethical review	Approved WMO
Status	Recruitment stopped
Health condition type	Vascular haemorrhagic disorders
Study type	Observational non invasive

Summary

ID

NL-OMON37259

Source
ToetsingOnline

Brief title
Changes in brain activity patterns during movement after stroke.

Condition

- Vascular haemorrhagic disorders

Synonym
cerebrovascular accident (CVA), Stroke

Research involving
Human

Sponsors and support

Primary sponsor: Medisch Spectrum Twente

Source(s) of monetary or material Support: Ministerie van OC&W

Intervention

Keyword: Brain activity, Imaging, Movement, Stroke

Outcome measures

Primary outcome

The correlation between changes in motor control and motor function and cortical activity is measured by comparing the scores of the grip strength (motor control) and the Fugl-Meyer motor assessment (motor function) with the changes in activity of the cortex. The activity of the brain is summarized in *topoplots* showing the degree of (de)synchronization by a colorscale projected on a headmodel. Change of activity of the cortex is quantified by calculating the event related synchronization (i.e. the difference in power of the EEG between the resting and the action condition), and the Brain Symmetry Index (i.e. the symmetry of the activity between the two hemispheres).

Secondary outcome

There are no secundary study parameters

Study description

Background summary

After stroke, many people suffer from motor function impairment. During the period of rehabilitation, changes occur in the activation of the brain. These changes are thought to relate to motor function recovery after stroke.
During the execution of a movement, the motor areas of the brain are active. Previous studies found that also during observation of a movement these motor areas are activated. In order to understand the relation between cortical activity during observation and execution of movements and motor fucntion recovery after stroke, the current study will examine the changes of cortical

activity during the first few months after stroke during movement observation and movement execution. These changes will be related to motor function and motor control.

Study objective

The objective of the study is to examine the relation between changes in cortical activity during movement observation and execution, and changes in motor function and motor control after stroke. The hypotheses to study this objective are: 1. Brain activity during movement observation after stroke correlates with the brain activity during the execution of a movement; 2. Changes in motor function correlate with changes in cortical activity during observation of a movement; 3. Movement observation in addition to movement execution results in an increased cortical activity compared to movement without observation.

Study design

The study is a longitudinal study, with 4 measurements divided over 4 months.

Study burden and risks

Four measurements will be done, 1 in the Medisch Spectrum Twente, while the patient is admitted to the hospital.
For the three following measurements, the patient will be asked to return to the hospital. Each measurement will be the same and takes about 2 hours. Each measurement is started with the assessment of the grip strength, followed by assessment of motor function by using the *upper-extremity part* of the Fugl-Meyer motor assessment.
EEG is measured during rest with eyes openend (1 minute), and eyes closed (1 minute), and while the patient watches a movie of about 9 minutes showing a moving hand or a moving dot (rest condition). In addition, the patient sees the movie while executing the movement his-/herself. Thereafter, the patient has to make the movement by his-/herself without the movie (20x 5 seconds, with each hand). The movement to be made is a tweezers grip (the top of the thumb to the top of the indexfinger). If the patient is not able to execute the movement, the patient only has to try 20 times, 5 seconds.
No risks are involved in the study.

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

- First ever ischemic stroke
- Unilateral cortical and/or subcortical stroke
- Stroke < 1 week ago
- Some motor dysfunction of the arm/hand (MRC < 5)
- Age between 18 and 80 years

Exclusion criteria

- Other (pre-existing) neurological diseases (e.g. epilepsy, tumor, paralysis)
- Autism spectrum disorders, PDD, schizophrenia (or history of schizophrenia)
- Instable medical health situation (cardiovascular and/or neurological)
- Uncompensated hemineglect or cognitive disabilities, resulting in misunderstanding or incapability of executing instructions given
- Uncorrected visual problems, i.e. not able to observe the movie on the screen

Study design

Design

Study type: Observational non invasive

Masking:	Open (masking not used)
Control:	Uncontrolled
Primary purpose:	Treatment

Recruitment

NL

Recruitment status:	Recruitment stopped
Start date (anticipated):	01-04-2010
Enrollment:	15
Type:	Actual

Ethics review

Approved WMO

Date:	08-04-2009
Application type:	First submission
Review commission:	METC Twente (Enschede)

Approved WMO

Date:	18-10-2011
Application type:	Amendment
Review commission:	METC Twente (Enschede)

Study registrations

Followed up by the following (possibly more current) registration

No registrations found.

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

No registrations found.

In other registers

Register	ID
CCMO	NL22476.044.08