

Muscle synergies in reaching movements of stroke patients

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Ethical review	Approved WMO
Status	Recruitment stopped
Health condition type	Central nervous system vascular disorders
Study type	Observational non invasive

Summary

ID

NL-OMON34879

Source

ToetsingOnline

Brief title

Muscle activation during reaching after stroke

Condition

- Central nervous system vascular disorders

Synonym

Cerebro Vascular Accident, Stroke

Research involving

Human

Sponsors and support

Primary sponsor: Revalidatiecentrum Het Roessingh

Source(s) of monetary or material Support: subsidie innovatiecentrum

Intervention

Keyword: Muscle activation, Reach, Stroke, Synergies

Outcome measures

Primary outcome

In the current study, patterns of muscle activity (measured with electromyography (EMG)) and kinematics (measured with an instrumented exoskeleton) during reaching movements in non-affected persons and stroke patients are considered. Muscle synergies will be extracted from the recorded EMG data, with accompanying time onset and amplitude parameters. We are interested in the difference in amount of synergies between both groups, the muscles included in the synergies and the accompanying parameters.

Secondary outcome

Apart from the primary outcome, the relation between motor functioning (measured with the Fugl-Meyer test and kinematics) and extracted synergies will be considered in the stroke population.

Study description

Background summary

Many stroke patients suffer from changes in motor function. Underlying mechanisms of this changed motor function are not known yet. Muscle activation patterns, responsible for the production of movements, have to be studied to get insight in motor control. Couplings of muscle activation patterns (muscle synergies) have been extracted from muscle activation patterns in non-affected persons. To gain insight in motor control in stroke patients, muscle synergies also have to be studied in this population. Comparing the presence of synergies in stroke patients with non-affected persons and relating these findings with the presented motor behavior will provide insight in the role of muscle synergies in the production of changed motor behavior in stroke

patients. Rehabilitation is of importance to promote arm function in order to perform activities of daily living. Insight in motor control of stroke patients can help improving rehabilitation programs.

Study objective

The aim of the current study is to identify couplings of muscle activation patterns (muscle synergies) in reaching movements in stroke patients. Insight in the motor control of stroke patients can contribute to improve the disabled arm functioning by improving rehabilitation therapy.

Study design

The study has a cross-sectional design. Muscle activation patterns and kinematics of the arm and shoulder will be measured during different conditions of a reaching task, performed at different velocities, in one measurement session. No intervention will be applied.

Study burden and risks

The risks for the subjects are limited to a minimum, since the movement tasks represent functional and familiar arm movements and are performed only within the scope of the subject's ability while he/she is seated. In addition, the measurements used in this study (EMG, motion analysis, functional scales) are all noninvasive and involve no risks to the participants in any way. Participation of a subject in this experiment has no direct benefit for him/her, other than expanding knowledge about underlying mechanisms relevant during the restoration of arm function during post-stroke rehabilitation. This may eventually aid in the development of new applications or adaptations to existing treatments in the rehabilitation of arm function after stroke.

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

- At least 6 months post-stroke.
- The function of the right arm is affected.
- Able to lift the right arm against gravity and perform a horizontal and vertical reaching movement.
- Able to decide whether to participate or not and to sign an informed consent.

Exclusion criteria

- Pain in the upper extremity or shoulder, either in rest or during movements.
- Orthopedic or rheumatologic ailments, which might constrain the mobility and/or force of the arm.
- Additional neurological diseases.
- Inability to understand and/or to follow the instructions given.

Study design

Design

Study type: Observational non invasive

Intervention model: Other

Allocation:	Non-randomized controlled trial
Masking:	Open (masking not used)
Control:	Active
Primary purpose:	Other

Recruitment

NL	
Recruitment status:	Recruitment stopped
Start date (anticipated):	08-04-2010
Enrollment:	25
Type:	Actual

Ethics review

Approved WMO	
Date:	04-03-2010
Application type:	First submission
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	NL30813.044.09