

Cortical activation during voluntary contraction in spinal cord injured subjects

Published: 04-09-2007

Last updated: 11-05-2024

In humans with SCI, we propose to use functional magnetic resonance imaging (fMRI) to: 1) examine the cortical areas that are activated during voluntary contractions, and 2) evaluate how cortical activation patterns change as a muscle is fatigued....

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

Summary

ID

NL-OMON39304

Source

ToetsingOnline

Brief title

Cortical activation in SCI

Condition

- Other condition

Synonym

spinal cord injury

Health condition

fundamenteel wetenschappelijk onderzoek

Research involving

Human

Sponsors and support

Primary sponsor: Universitair Medisch Centrum Groningen

Source(s) of monetary or material Support: NIH

Intervention

Keyword: cortical activation, EMG spinal cord injury, force

Outcome measures

Primary outcome

Brain activity (BOLD-data), force and EMG data

Secondary outcome

non applicable

Study description

Background summary

After human spinal cord injury (SCI), muscles are usually weak and fatigable, characteristics that severely limit their function. An ability to maintain adequate voluntary drive to muscles over time, termed central fatigue, is a prevalent component of the functional deficits seen after SCI. While motor evoked potentials represent one way to examine central fatigue, the afferent contributions to the declines in muscle force have not been evaluated.

Study objective

In humans with SCI, we propose to use functional magnetic resonance imaging (fMRI) to: 1) examine the cortical areas that are activated during voluntary contractions, and 2) evaluate how cortical activation patterns change as a muscle is fatigued. We hypothesize that more areas of the brain are activated during voluntary contractions performed by spinal cord injured subjects compared to control subjects. In SCI subjects, we expect that the brain areas activated during voluntary contractions will include areas related to muscles that remain under voluntary control and areas that used to be activated during contractions of muscles that are now paralyzed by SCI. With respect to central fatigue, maintained contractions result in an increase in the intensity of the active brain areas in control subjects. How brain activity in SCI subjects is influenced by prolonged contractions is unknown. Thus, these fMRI studies are a

powerful way to explore in vivo changes in cortical function in SCI individuals as they perform functional tasks.

Study design

Subjects perform contractions in an MR-scanner. During the contractions EMG and brain activity is measured.

Intervention

Subjects perform contractions and a fatigue test in an MR-scanner

Study burden and risks

Subjects produce force in an MR-scanner, no risks are known. During the contraction the muscle is stimulated. The stimulation could be a little painful.

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

Spinal cord injury

Exclusion criteria

Metal implants that are not compatible with the MR-scanner

Study design

Design

Study type:	Interventional
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):	20-03-2008
Enrollment:	48
Type:	Actual

Ethics review

Approved WMO

Date:	04-09-2007
Application type:	First submission
Review commission:	METC Universitair Medisch Centrum Groningen (Groningen)
Approved WMO	
Date:	04-10-2013
Application type:	Amendment
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

No registrations found.

In other registers

Register	ID
CCMO	NL18789.042.07