Complex movements - a high resolution fMRI study

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The objective of this study is to assess spatial cortical representation of hand and mouth movements. This will inform us on the feasibility of decoding these patterns for BCI purposes.

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

Summary

ID

NL-OMON35850

Source
ToetsingOnline

Brief title
Complex movements - a high resolution fMRI study

Condition

- Other condition

Synonym
n.a.

Health condition

Het onderzoek is basaal en betreft alleen gezonde proefpersonen. De resultaten kunnen aan de ontwikkeling van een brain computer inferface voor ernstig verlamde mensen bijdragen.

Research involving
Human

Sponsors and support

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

Intervention

Keyword: brain computer interface, classification, fMRI, motor programs

Outcome measures

Primary outcome

Characterisation, detection and classification of motor programs.

Secondary outcome

Comparing motor programs in different contexts.

Study description

Background summary

Patients with neuromuscular diseases (e.g. amyotrophic lateral sclerosis), stroke or brain stem lesions, can lose the physical ability to communicate while being cognitively intact. Brain computer interfaces (BCI) promise to restore the communication for the severely handicapped, by bypassing the defective motor system and providing a direct link between the brain of a patient and an external device (e.g. a computer).
We are working towards a multidimensional BCI, that allows patients a fast and flexible communication. For this purpose we are interested in how complex hand and mouth movements are represented on the cortex and whether different movements can be discriminated.

Study objective

The objective of this study is to assess spatial cortical representation of hand and mouth movements. This will inform us on the feasibility of decoding these patterns for BCI purposes.

Study design

We will perform an event related study using high field (7 Tesla) functional magnetic resonance imaging (fMRI) in 24 healthy volunteers. The volunteers will

be asked to execute, imagine or observe different hand or mouth movements.

Study burden and risks

There are no known risks associated with fMRI acquisition. The technique does not require administration of any contrast agent or ionizing radiation. The fMRI procedure is painless and not uncomfortable, although it does require the subject to lie still with the head and part of the body confined in a tunnel-like device.
If the subject is uncomfortable with any aspect of the procedure the session will be terminated. If the study is terminated, every effort will be taken to ensure that the experience for the subject is still a positive one.
The subject is provided with earplugs to protect him from the scanner noise. Also MR compatible clothing is provided for the time in the scanner. An intercom is available in the MR scanner to remain in contact with the subject during the whole session and an emergency button is placed with the subject with which he can indicate to stop the procedure immediately. The MR scanner is handled by trained personnel and subjects are screened for metal before entering the scanner.

No immediate benefits are to be expected from participation in this study for the subjects. This research is fundamental in nature and has no immediate medical or technical application. However, the knowledge on the fundamental neuronal mechanisms that will be acquired could eventually be essential for medical interventions or brain computer interfaces.

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

right handed
age between 18 and 45 years
written informed consent of the subject

Exclusion criteria

pregnancy
metal objects in or around the body (braces, pacemaker,metal fragments)
Claustrophobia

Study design

Design

Study type: Observational invasive

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

Recruitment

NL

Recruitment status:	Recruitment stopped

Start date (anticipated):	11-10-2011
Enrollment:	24
Type:	Actual

Ethics review

Approved WMO Date:	19-08-2011
Application type:	First submission
Review commission:	METC Universitair Medisch Centrum Utrecht (Utrecht)

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	NL36025.041.11