The effects of transcranial direct current stimulation on the motor network in its resting state.

Published: 25-08-2009
Last updated: 04-05-2024

The objective of the study is to investigate the changes in cortical connectivity patterns, as measured by resting-state fMRI, as a consequence of the use of transcranial direct current stimulation.

Ethical review	Approved WMO
Status	Recruiting
Health condition type	Movement disorders (incl parkinsonism)
Study type	Interventional

Summary

ID

NL-OMON32969

Source
ToetsingOnline

Brief title
Effects of tDCS on rs-fMRI

Condition

- Movement disorders (incl parkinsonism)

Synonym
n.a.

Research involving
Human

Sponsors and support

Primary sponsor: Universitair Medisch Centrum Sint Radboud
Source(s) of monetary or material Support: Ministerie van OC&W,Smartmix consortium BrainGain

Intervention

Keyword: - motor network, - resting-state fMRI, - transcranial direct current stimulation

Outcome measures

Primary outcome

The changes in spontaneous low frequency fluctuations of the blood oxygenation level dependent (BOLD) signal throughout the brain as measured via functional magnetic resonance imaging (fMRI).

Secondary outcome

none

Study description

Background summary

Transcranial direct current stimulation (tDCS) is a promising technique to non-invasively study and alter human brain function by means of sending a weak direct current through the skull and brain via two electrodes. This stimulation can alter neural excitability in the cortex and its effect can outlast stimulation for up to one hour. Being a safe, cheap and mobile technique, this makes tDCS a candidate for the clinical treatment of several neurological disorders. However, more research needs to be performed in order to assess the effects of tDCS inside the brain. We will use resting-state functional magnetic resonance imaging (rs-fMRI) in order to investigate the effects tDCS exerts on the functional connectivity networks in the brain.

Study objective

The objective of the study is to investigate the changes in cortical connectivity patterns, as measured by resting-state fMRI, as a consequence of the use of transcranial direct current stimulation.

Study design

Intervention study

Intervention

Transcranial direct current stimulation will be administered anodally over the motor cortex with a current intensity of 1 mA and a duration of 15 minutes.

Study burden and risks

Transcranial direct current stimulation has been shown to be a very safe technique with only minor adverse effects. During stimulation subjects will probably experience a mild tingling sensation and possibly moderate fatigue or a light itching sensation under the stimulation electrodes. After stimulation there is a reasonable chance of transient headache and nausea. The total experiment will only last one hour. There are no direct benefits for the participants.

Contacts

Public
Universitair Medisch Centrum Sint Radboud

Postbus 9101
6500 HB Nijmegen
Nederland
Scientific
Universitair Medisch Centrum Sint Radboud

Postbus 9101
6500 HB Nijmegen
Nederland

Trial sites

Listed location countries

Netherlands

Eligibility criteria

Age

Adults (18-64 years)

Elderly (65 years and older)

Inclusion criteria

Age: 18-65

Exclusion criteria

- any metal in body other than fillings or crowns
- cardiac arrhythmia
- claustrophobia
- pregnancy
- damaged skin at site of stimulation
- neuropsychiatric disorder or ongoing use of psychoactive medications
- history of neurological illness (including epilepsy) or neurosurgical procedure
- history of medication-resistant epilepsy in the family
- history of severe substance abuse
- previous treatment with tDCS

Study design

Design

Study type: Interventional

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

Recruitment

NL

Recruitment status:	Recruiting
Start date (anticipated):	01-12-2009
Enrollment:	30
Type:	Actual

Medical products/devices used

Registration:	No

Ethics review

Approved WMO Date:	25-08-2009
Application type:	First submission
Review commission:	CMO regio Arnhem-Nijmegen (Nijmegen)

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	NL28989.091.09