Muscle relaxation induced by transcranial magnetic stimulation: an optimisation study

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To quantify the effects of several factors on muscle relaxation of the finger flexors measured with TMS. These factors are contraction strength (as a percentage of the maximum), stimulus intensity, muscle temperature, and position of stimulator coil...

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

Summary

ID

NL-OMON45291

Source
ToetsingOnline

Brief title
Optimisation of TMS-induced muscle relaxation

Condition

- Muscle disorders
- Neuromuscular disorders

Synonym
NA (physiology in healthy subjects)

Research involving
Human

Sponsors and support

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

Intervention

Keyword: Muscle relaxation, Optimisation, Transcranial magnetic stimulation

Outcome measures

Primary outcome

- Peak relaxation rate normalized to force prior to relaxation

- Half-relaxation time: the time needed for force to drop from 100% to 50% of maximal force

Secondary outcome

- Maximal force of fingerflexors

- Percentage force decrease in first 150ms after the TMS pulse.

- Duration of the silent period

Study description

Background summary

Transcranial magnetic stimulation (TMS) can induce involuntary muscle relaxation by abruptly interrupting corticospinal drive to the muscle (~200ms). Slow muscle relaxation might be indicative for differnent myopathies. We have previously shown a slow muscle relaxation in patients with Brody disease. The current study is focused on optimising the set-up for measuring muscle relaxation using TMS. The final goal of these studies is to develop a screening test to determine which patients with positive muscle phenomena might be suffering from a muscle disease.

Study objective

To quantify the effects of several factors on muscle relaxation of the finger flexors measured with TMS. These factors are contraction strength (as a percentage of the maximum), stimulus intensity, muscle temperature, and position of stimulator coil. The primary outcome measures are normalised peak relaxation rate and relaxation time. Another objective is to evaluate the interday reproducibility of TMS-induced muscle relaxation and compare it with

voluntary relaxation.

Study design

Explorative research to determine the influence of contraction strength, temperature, stimulus position and intensity on the relaxation profile of finger flexor muscles. Furthermore we want to evaluate the interday reproducibility of TMS-induced muscle relaxation and compare it with voluntary relaxation.

Study burden and risks

Three visits to our lab of 45-60 minutes. There can be slight discomfort from the TMS (mild headache in 2-4% of subjects).

Contacts

Public
Selecteer

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Scientific
Selecteer

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Trial sites

Listed location countries

Netherlands

Eligibility criteria

Age
Adults (18-64 years)

Elderly (65 years and older)

Inclusion criteria

Age of 20 to 60 years old

Exclusion criteria

Age <18
Pregnancy
Serious head trauma or brain surgery
Diagnosis of any neuromuscular disorder
Large or ferromagnetic metal parts in the head Implanted cardiac pacemaker or neurostimulator Epilepsy, convulsion or seizure
Use of medication that can influence muscle relaxation or cortical excitability
Duration of silent period <180ms despite using maximal stimulator intensity

Study design

Design

Study type: Observational invasive

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

Recruitment

NL

Recruitment status:	Recruitment stopped
Start date (anticipated):	15-05-2017
Enrollment:	10
Type:	Actual

Ethics review

Approved WMO

Date:	01-05-2017
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	NL60169.091.16