Cerebellar transcranial direct current stimulation in SCA3

No registrations found.

Ethical review	Positive opinion
Status	Recruiting
Health condition type	-
Study type	Interventional

Summary

ID

NL-OMON21004

Source
NTR

Brief title
SCA3-tDCS

Health condition

Spinocerebellar ataxia type 3 (spinocerebellaire ataxie type 3)

Sponsors and support

Primary sponsor: Radboud University Medical Center Nijmegen.
Source(s) of monetary or material Support: Hersenstichting (Brugling Fund).

Intervention

Outcome measures

Primary outcome

- Absolute change of the SARA score between baseline and T1.

Secondary outcome

- Percentage of patients in both groups who have a decrease in SARA score of at least 1.5

point at T1 compared to baseline.

- SARA score (and subscores) at T0 after tDCS, T2, T3, and T4.

- 9-hole peg test at T0 after tDCS, T1, T2, T3, and T4 compared to T0 before tDCS (upper limb dexterity).

- 8 m walking test at T0 after tDCS, T1, T2, T3, and T4 compared to T0 before tDCS (gait speed).

- PATA repetition rate at T0 after tDCS, T1, T2, T3, and T4 compared to T0 before tDCS.

- INAS count at T1, T2, T3, and T4 compared to T0 before tDCS (extracerebellar involvement).

- Postural sway: total path length and standard deviation/variance of the center of pressure in anterioposterior and mediolateral direction, maximal amplitude and standard deviation/variance of the CoP in anterioposterior and mediolateral direction, speed and standard deviation/variance of the CoP in anterioposterior and mediolateral direction.

- EQ-5D at T1, T2, T3, and T4 compared to T0 before tDCS (quality of life).

- PHQ-9 at T1, T2, T3, and T4 compared to T0 before tDCS (depression).

- 32-item version of the POMS at T1, T2, T3, and T4 (mood states).

- Cerebellar Cognitive Affective Syndrome scale at T1, T2, T3, and T4 (cerebellar cognitive and affective functions). Differences in absolute scores will be investigated as well as differences in the numbers of ''fails''.

- Activities of Daily Living (part 2 of the Friedreich Ataxia Rating Scale) at T2 and T4 compared to T0 before tDCS.

- iMTA Medical Consumption Questionnaire at T4 compared to T0 before tDCS.

- Acquisition of conditioned responses in a delay eyeblink classical conditioning paradigm (motor learning). Differences in the percentage of conditioned responses in the sixth (last) learning block will be compared between T0 before tDCS and T1 as well as differences in the percentage of conditioned responses in all (six) learning blocks between T0 before tDCS and T1. Differences in timing of the conditioned responses in all learning blocks between T0 before tDCS and T1.

- Cerebellar brain inhibition (using TMS) at T1: difference between T0 before tDCS and T1 in the MEP amplitude as a percentage of the unconditioned MEP amplitude over the motor cortex.

- Possible tDCS-related side effects.

- Percentage of patients in both conditions that correctly guess to which groups they have been randomized.

Study description

Background summary

Rationale: Spinocerebellar ataxia type 3 (SCA3) is the most common subtype among the autosomal dominant cerebellar ataxias, a group of debilitating, progressive conditions for which currently no disease-specific treatment ¨C i.e. aimed at the underlying molecular and cellular processes ¨C is available. Evidence-based options for symptomatic treatment of ataxia are also limited. Recent investigations in a heterogeneous group of both hereditary and acquired ataxias show promising results of cerebellar transcranial direct current stimulation (tDCS). We here aim to test the hypothesis that increasing cerebellar excitability through cerebellar tDCS improves ataxia symptoms in a homogeneous cohort of SCA3 patients.

Objective: To investigate whether a two-weeks treatment with cerebellar anodal tDCS could improve ataxia severity and a variety of non-motor symptoms (including motor learning) and whether it could modulate cerebellar brain inhibition pathways compared to sham stimulation.
Study design: Double-blind, randomized (1:1), sham-controlled, single-center exploratory trial.

Study population: 20 SCA3 patients.

Intervention: Patients will be randomized to either sham or real cerebellar tDCS, an increasingly used, short, cheap, and non-invasive tool that modulates cerebellar excitability using a pair of electrodes.
Main study parameters/endpoints: The primary outcome measure is the absolute change on the Scale for the Assessment and Rating of Ataxia (SARA). Secondary outcome measures include SCA Functional Index (motor performance), Inventory of Non-Ataxia Signs count (extracerebellar involvement), EQ-5d (quality of life), Patient Health Questionnaire-9 (depression), short version of the POMS (mood states), Cerebellar Cognitive Affective Syndrome scale (specifically cerebellar cognitive functions), Activities of Daily Living, amount of medical consumption, percentage and timing of conditioned responses using a delay eyeblink classical conditioning (EBCC) paradigm (motor learning), and cerebellar brain inhibition using transcranial magnetic stimulation (TMS).

Country of recruitment: the Netherlands.

Study objective

Spinocerebellar ataxia type 3 (SCA3) is the most common subtype among the autosomal dominant cerebellar ataxias, a group of debilitating, progressive conditions for which currently no disease-specific treatment ¨C i.e. aimed at the underlying molecular and cellular processes ¨C is available. Evidence-based options for symptomatic treatment of ataxia are also limited. Cerebellar transcranial direct current stimulation (tDCS) is an increasingly used, safe, short, cheap, and non-invasive tool that aims to modulate cerebellar excitability. Recent investigations in a heterogeneous group of both hereditary and acquired ataxias show promising results of cerebellar tDCS. We here aim to test the hypothesis that increasing cerebellar excitability through cerebellar tDCS improves ataxia symptoms in a homogeneous cohort of SCA3 patients.

Study design

- T0 before tDCS: baseline measurement, day 1.

- T0 after tDCS: to evaluate the effects of a single session of cerebellar tDCS, day 1.

- T1: after 10 days of cerebellar tDCS.

- T2: three months after T0.

- T3: six months after T0.

- T4: twelve months after T0.

Intervention

- Real cerebellar tDCS: anode (35 cm2) over the scalp 2 cm below the inion in the midline, cathode (35 cm2) over the right deltoid muscle. Total duration of stimulation: 20 minutes at 2 mA.
- Sham cerebellar tDCS: anode (35 cm2) over the scalp 2 cm below the inion in the midline, cathode (35 cm2) over the right deltoid muscle. Duration: 20 minutes (of which 40 seconds real stimulation, 2 mA).
Ramp-up and ramp-down periods of 30 seconds will be applied in which intensity is gradually increased to or decreased from 2 mA.

Contacts

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Eligibility criteria

Inclusion criteria

- A proven SCA3 mutation (ATXN3 gene).

- Age 16 years and older.

- SARA (Scale for the Assessment and Rating of Ataxia) score 20 or less.

Exclusion criteria

- Epilepsy.

- History of brain surgery.

- Co-morbid neurological conditions.

- Metallic implants in or near the skull.

- Pacemaker.

- Significant comorbidities that interfere with activities of daily life.

- Pregnancy.

- Severe skin disease affecting the location where the tDCS electrodes will be placed.

Study design

Design

Study type: Interventional

Intervention model:	Parallel
Allocation:	Randomized controlled trial
Masking:	Double blinded (masking used)
Control:	Placebo

Recruitment

NL

Recruitment status:	Recruiting
Start date (anticipated):	01-11-2018
Enrollment:	20
Type:	Anticipated

IPD sharing statement

Plan to share IPD: Undecided

Ethics review

Positive opinion

Date:	08-10-2018
Application type:	First submission

Study registrations

Followed up by the following (possibly more current) registration

ID: 46775
Bron: ToetsingOnline
Titel:

Other (possibly less up-to-date) registrations in this register

No registrations found.

In other registers

Register	ID
NTR-new	NL7321
NTR-old	NTR7537
CCMO	NL65454.091.18
OMON	NL-OMON46775

Study results