Clinical Trial Protocol
Iranian Registry of Clinical Trials

22 Nov 2026

The effect of motor cortex and cerebellum regions trans cranial direct current stimulation on implicit motor learning in healthy individuals; a comparative study

Protocol summary

Summary

The purpose of the present study was to investigate the efficacy of trans-cranial direct current stimulation (TDCS) application over the motor cortex compared to the cerebellum region on the implicit motor learning in the healthy individuals. This study has clinical trial design. Participants will be randomly allocated in to three groups included; Group I who received 20 minutes TDCS over the motor cortex, Group II who received 20 minutes TDCS over the cerebellum region and Group III who served as placebo group (mounted TDCS electrodes over the motor cortex and cerebellum region randomly without any TDCS currents for 2 minutes). The healthy participants with 18-35 years with right dominant hand will be included. Participants who have history of neurological diseases or musculoskeletal disorders, severe perceptual and memorial problems, brain diseases, visual and auditory problems, upper extremity pathology and range of motion limitation will be excluded. All participants will be asked to perform a serial reaction time task (SRTT) during experiment. The SRTT will be repeated for 35 minutes and then two days after applying TDCS. Decreasing reaction time of the SRTT in the first session will be considered as the online learning and in the second session as the offline learning. Accordingly, the obtained data will be analyzed.

General information

Acronym

IRCT registration information

IRCT registration number: **IRCT2015030221294N1**
Registration date: **2015-05-28, 1394/03/07**
Registration timing: **registered_while_recruiting**

Last update:
Update count: **0**

Registration date

2015-05-28, 1394/03/07

Registrant information

Name
Fatemeh Ehsani
Name of organization / entity
Semnan University of Medical Sciences
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Recruitment status

Recruitment complete

Funding source

Neuromuscular Rehabilitation Research Center, Semnan University of Medical Sciences, Semnan, Iran

Expected recruitment start date

2015-04-01, 1394/01/12

Expected recruitment end date

2015-10-01, 1394/07/09

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

The effect of motor cortex and cerebellum regions trans cranial direct current stimulation on implicit motor learning in healthy individuals; a comparative study

Public title

The effect of motor cortex and cerebellum regions trans-cranial direct current stimulation on implicit motor

learning in healthy individuals; a comparative study

Purpose

Basic scienece

Inclusion/Exclusion criteria

The main conditions of inclusion criteria: Participants (male or female) who have mean age of 18-35 years; Participants are right dominant hand. The main conditions of exclusion criteria: Participants who have a history of neurological diseases or musculoskeletal disorders; Participants with severe perceptual and memorial problems that based on mini mental status examination (MMSE) have scale less than 21; Having a history of brain diseases, especially Parkinson and Alzheimer's; Having visual and auditory problems; Having upper extremity pathology and range of motion limitations.

Age

From **18 years** old to **35 years** old

Gender

Both

Phase

2

Groups that have been masked

No information

Sample size

Target sample size: **30**

Randomization (investigator's opinion)

Randomized

Randomization description

Blinding (investigator's opinion)

Not blinded

Blinding description

Placebo

Used

Assignment

Parallel

Other design features

Secondary Ids

empty

Ethics committees

1

Ethics committee

Name of ethics committee

Ethics commitie of Semnan university of medical science

Street address

Semnan, 5 kilometer in Damghan Road

City

Semnan

Postal code

Approval date

2015-05-24, 1394/03/03

Ethics committee reference number

94/25/583

Health conditions studied

1

Description of health condition studied

Healthy individual

ICD-10 code

ICD-10 code description

Primary outcomes

1

Description

Reaction time

Timepoint

Before, 35 minute and two days after intervention

Method of measurement

Color Matching Test Software

Secondary outcomes

1

Description

Error meaning

Timepoint

Before, 35 minute and two days after intervention

Method of measurement

Color Matching Test Software

Intervention groups

1

Description

Before using TDCS, the participants will be asked to do SRT task containing 2 blocks. Then, anodal and cathodal electrodes will be positioned on motor cortex and contra-lateral buccinator muscle, respectively. Stimulation will be used with 2 Mili Ampere intensity for 20 minutes. The participants concurrently will be asked to do SRT task containing 8 blocks. 35 minute and two days after test, the participants will be asked to repeat doing SRT task containing 2 blocks.

Category

Treatment - Other

2

Description

Before using TDCS, the participants will be asked to do SRT task containing 2 blocks. Then, anodal and cathodal electrodes will be positioned on cerebellum and ipsi-lateral buccinator muscle, respectively. Stimulation will be used with 2 Mili Ampere intensity for 20 minutes. The participants concurrently will be asked to do SRT task containing 8 blocks. 35 minute and two days after test, the participants will be asked to repeat doing SRT task containing 2 blocks.

Category

Other

3

Description
Before using sham TDCS, the participants will be asked to do SRT task containing 2 blocks. Then, electrodes will be positioned randomly on motor cortex and cerebellum of any participant. Stimulation will be used with 2 Mili Ampere intensity for 2 second. The participants concurrently will be asked to do SRT task containing 8 blocks. 35 minute and two days after test, the participants will be asked to repeat doing SRT task containing 2 blocks.

Category
Placebo

Recruitment centers

1

Recruitment center

Name of recruitment center
Neuromuscular Rehabilitation Research Center

Full name of responsible person
Fatemeh Ehsani

Street address
Mashahir Square, Blvd. Ghods

City
Semnan

Sponsors / Funding sources

1

Sponsor

Name of organization / entity
Vice chancellor for research, Semnan University of Medical Sciences

Full name of responsible person
Dr. Asghary

Street address
Vice chancellor for research, Semnan University of Medical Sciences, Blvd. Basigh, Semnan, Iran

City
Semnan

Grant name

Grant code / Reference number

Is the source of funding the same sponsor organization/entity?
Yes

Title of funding source
Vice chancellor for research, Semnan University of Medical Sciences

Proportion provided by this source
100

Public or private sector
empty

Domestic or foreign origin
empty

Category of foreign source of funding
empty

Country of origin

Type of organization providing the funding
empty

Person responsible for general inquiries

Contact

Name of organization / entity
Neuromuscular Rehabilitation Research Center

Full name of responsible person
Fatemeh Ehsani

Position
Ph.D. student of Physical Therapy, Faculty scholarship

Other areas of specialty/work

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Person responsible for scientific inquiries

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Neuromuscular Rehabilitation Research Center, Semnan University of Medical Sciences

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Position
Ph.D. Student in physical Therapy, Facalty Scholarships

Other areas of specialty/work

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Person responsible for updating data

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Sharing plan

Deidentified Individual Participant Data Set (IPD)

empty

Study Protocol

empty

Statistical Analysis Plan

empty

Informed Consent Form

empty

Clinical Study Report

empty

Analytic Code

empty

Data Dictionary

empty