Clinical Trial Protocol
Iranian Registry of Clinical Trials

07 Nov 2026

The effect of cerebellum transcranial direct current stimulation on implicit motor learning in healthy older adults

Protocol summary

Summary

The purpose of the present study was to investigate the efficiency of trans-cranial direct current stimulation (TDCS) application over the cerebellum region on implicit motor learning in healthy older adults. This study has clinical trial design. Participants will be randomly allocated in to two groups included; Group I who received 20 minutes TDCS over the cerebellum region and Group II who served as placebo group (mounted TDCS electrodes over the cerebellum region without any TDCS currents for 2 minutes). The healthy older participants with 60-80 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 TDSC treatment. 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 and third sessions as the offline learning. Accordingly, the obtained data will be analyzed.

General information

Acronym

IRCT registration information

IRCT registration number: **IRCT2015112321294N2**
Registration date: **2016-03-07, 1394/12/17**
Registration timing: **registered_while_recruiting**

Last update:
Update count: **0**

Registration date

2016-03-07, 1394/12/17

Registrant information

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

Recruitment complete

Funding source

Vice chancellor for research, Semnan University of Medical Sciences, Semnan, Iran.

Expected recruitment start date

2016-02-29, 1394/12/10

Expected recruitment end date

2016-06-30, 1395/04/10

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

The effect of cerebellum transcranial direct current stimulation on implicit motor learning in healthy older adults

Public title

The effect of cerebellum transcranial direct current stimulation on implicit motor learning in healthy older adults

Purpose

Treatment

Inclusion/Exclusion criteria

Inclusion criteria: Participants who have 60-80 years old

and their right hand is dominant hand, will be concluded. Exclusion criteria: Participants had no history of neurological diseases or musculoskeletal disorders; Adults with severe perceptual and memory problems evidenced by Mini Mental Status Examination (MMSE) scores of less than 21; having neurological disease, especially Parkinson and Alzheimer's; having visual or auditory problems; having upper extremity pathology and range of motion limitations will be excluded from the study.

Age
From **60 years** old to **80 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)
Single 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
5 kilometer in Damghan Road, Semnan Iran

City
Semnan

Postal code

Approval date
2016-02-09, 1394/11/20

Ethics committee reference number
IR.SEMUMS.REC.1394.171

Health conditions studied

1

Description of health condition studied
-

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
Intervention group: 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 deltoid muscle, respectively. Stimulation will be used with 2 Mili Ampere intensity for 20-minute. The participants concurrently will be asked to do SRT task containing 8 blocks. The participants will be asked to repeat doing SRT task containing 2 blocks, 35 minute and two days after TDCS intervention.

Category
Other

2

Description
Control group: Before using sham-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 deltoid muscle, respectively. Stimulation will be used with 2 Mili Ampere intensity for 2-minute. The participants concurrently will be asked to do SRT task containing 8 blocks. The participants will be asked to repeat doing SRT task containing 2 blocks, 35 minute and two days after sham-TDCS intervention.

Category
Other

Recruitment centers

1

Recruitment center
Name of recruitment center
Neuromuscular Rehabilitation Research Center
Full name of responsible person
Fatemeh Ehsani
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Sponsors / Funding sources

1

Sponsor
Name of organization / entity
Vice Chancellor for research of Semnan University of Medical Sciences
Full name of responsible person
Dr. Ali Rashidipoor
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Vice Chancellor for research of Semnan University of Medical Sciences, Blvd. Basig, Semnan
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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 of 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
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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