Clinical Trial Protocol
Iranian Registry of Clinical Trials

07 Nov 2026

The effect of M1 transcranial direct current stimulation on implicit motor learning in the patients with multiple sclerosis

Protocol summary

Study aim
The effect of M1 transcranial direct current stimulation on implicit motor learning in the patients with multiple sclerosis

Design
Non-random(Days of the Week (Even and odd)), without placebo . The sample size of this study is 100 individuals: divided into 2 groups of 50 people.

Settings and conduct
Neuromuscular Rehabilitation Research Center Semnan University of Medical Sciences.

Participants/Inclusion and exclusion criteria
100 patients with Multiple Sclerosis diagnosis. Inclusion criteria: the age range of 18 to 45 years old; MS patients is detected according to guidelines; have received steady medical and physical therapies since the last 6 months; most are right-handed. Exclusion criteria: Multiple Sclerosis relapses during the last two months; existence severe visual defect on visual examination; existence severe weakness in limbs movement; other neurological and neurological diseases.

Intervention groups
Control group: In this group, the brain will receive electrical stimulation for twenty minutes, which will increase in intensity for the first 30 seconds, and then will decrease until the patient feels that there is current and will remain the same until the end of treatment. Intervention group (Brain electrical stimulation): In the intervention group, the active anode electrode is placed on the left side of the brain (C3) and the cathode electrode on the right side of the forearm to stimulate the brain area of the brain. Then an electrical stimulation of 2 mA with a gradual gradient for 20 minutes is applied according to the protocol. Response time is recorded for the task sequences before the intervention, 35 minutes after the intervention and 2 days after the intervention.

Main outcome variables
Brain electrical stimulation

General information

Reason for update

Acronym

IRCT registration information
IRCT registration number: **IRCT20151228025732N32**
Registration date: **2018-07-14, 1397/04/23**
Registration timing: **retrospective**

Last update: **2018-07-14, 1397/04/23**
Update count: **0**

Registration date
2018-07-14, 1397/04/23

Registrant information

Name
Alireza Emadi

Name of organization / entity
Semnan University of Medical Sciences, Semnan, Iran

Country
Iran (Islamic Republic of)

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Recruitment status
Recruitment complete

Funding source

Expected recruitment start date
2017-12-02, 1396/09/11

Expected recruitment end date
2018-05-31, 1397/03/10

Actual recruitment start date
empty

Actual recruitment end date
empty

Trial completion date
empty

Scientific title
The effect of M1 transcranial direct current stimulation on implicit motor learning in the patients with multiple sclerosis

Public title
The effect of M1 transcranial direct current stimulation on implicit motor learning in the patients with multiple sclerosis

Purpose
Prevention

Inclusion/Exclusion criteria
Inclusion criteria:
The age range of 18 to 45 years old MS patients is detected according to guidelines Have received steady medical and physical therapies since the last 6 months Most are right-handed
Exclusion criteria:
Multiple Sclerosis relapses during the last two months Existence severe visual defect on visual examination Existence severe weakness in limbs movement Other neurological and neurological diseases

Age
From **18 years** old to **45 years** old

Gender
Both

Phase
N/A

Groups that have been masked
No information

Sample size
Target sample size: **100**

Randomization (investigator's opinion)
Not randomized

Randomization description

Blinding (investigator's opinion)
Not blinded

Blinding description

Placebo
Not used

Assignment
Parallel

Other design features

Secondary Ids

empty

Ethics committees

1

Ethics committee
Name of ethics committee
Ethics committee of Semnan University of Medical Sciences
Street address
Semnan University of Medical Sciences, Basij Blvd, Semnan
City
Semnan
Province
Semnan
Postal code
3514799442
Approval date
2017-12-02, 1396/09/11
Ethics committee reference number
IR.SEMUMS.REC.1396.269

Health conditions studied

1

Description of health condition studied
Multiple sclerosis (MS)
ICD-10 code
G35
ICD-10 code description
Multiple sclerosis

Primary outcomes

1

Description
Brain electrical stimulation
Timepoint
48 and 72 hours after the intervention
Method of measurement
Transcranial Direct Current Stimulation (TDCS)

Secondary outcomes

empty

Intervention groups

1

Description
Control group: In this group, the brain will receive electrical stimulation for twenty minutes, which will increase in intensity for the first 30 seconds, and then will decrease until the patient feels that there is current and will remain the same until the end of treatment.
Category
Diagnosis

2

Description
Intervention group (Brain electrical stimulation): In the intervention group, the active anode electrode is placed on the left side of the brain (C3) and the cathode electrode on the right side of the forearm to stimulate the brain area of the brain. Then an electrical stimulation of 2 mA with a gradual gradient for 20 minutes is applied according to the protocol. Response time is recorded for the task sequences before the intervention, 35 minutes after the intervention and 2 days after the intervention.
Category
Treatment - 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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Neuromuscular Rehabilitation Research Center, Qods Blvd, Mashahir Aven.
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Sponsors / Funding sources

1

Sponsor

Name of organization / entity
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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
Semnan University of Medical Sciences

Proportion provided by this source
100

Public or private sector
Public

Domestic or foreign origin
Domestic

Category of foreign source of funding
empty

Country of origin

Type of organization providing the funding
Academic

Person responsible for general inquiries

Contact

Name of organization / entity
Semnan University of Medical Sciences
Full name of responsible person
Fatemeh Ehsani
Position
Associate professor
Latest degree
Ph.D.
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)
Yes - There is a plan to make this available
Study Protocol
No - There is not a plan to make this available
Statistical Analysis Plan
No - There is not a plan to make this available
Informed Consent Form
No - There is not a plan to make this available
Clinical Study Report
No - There is not a plan to make this available
Analytic Code
No - There is not a plan to make this available
Data Dictionary
No - There is not a plan to make this available
Title and more details about the data/document
-
When the data will become available and for how long
-
To whom data/document is available
Only available to scholars working in academic institutions.
Under which criteria data/document could be used
In case of relevant studies.
From where data/document is obtainable
Fatemeh Ehsani Neuromuscular Rehabilitation Research Center, Ghods Blvd. +98 9191310755
What processes are involved for a request to access data/document
-
Comments