

Clinical Trial Protocol

Iranian Registry of Clinical Trials

27 Jul 2026

study of transcranial magnetic stimulation effect on motor imagery rehabilitation and movement improvment in multiple sclerosis patients

Protocol summary

Summary

In recent years, the use of brain magnetic stimulation for cognitive rehabilitation and movement improvement in patients with different nerve system diseases has an interest. Transcranial magnetic stimulation is a non-invasive and painless method which is used to stimulate brain cortex. MS patients suffer from different cognitive disorder including impairment of information processing speed and working memory and they also suffer from movement disorder. Motor imagery which is a part of high cognitive function is impaired in MS patients. There is close connection between motor imagery and movement preparing and executing regarding activated cortex sites and active duration. It has been shown that motor imagery improvement has positive effect on movement execution. since there is no certain treatment for this disease and it has an unknown etiology , and with consideration of positive effect of rTMS, This research is supposed to make use of this technique for motor imagery and execution improvement.

General information

Acronym

IRCT registration information

IRCT registration number: **IRCT2013042313100N1**

Registration date: **2013-07-06, 1392/04/15**

Registration timing: **retrospective**

Last update:

Update count: **0**

Registration date

2013-07-06, 1392/04/15

Registrant information

Name

Mahdieh Azin

Name of organization / entity

Neuroscience Research Center- Kerman University of Medical Sciences

Country

Iran (Islamic Republic of)

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Recruitment status

Recruitment complete

Funding source

Kerman Neuroscience Research Center

Expected recruitment start date

2012-11-21, 1391/09/01

Expected recruitment end date

2013-06-20, 1392/03/30

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

study of transcranial magnetic stimulation effect on motor imagery rehabilitation and movement improvment in multiple sclerosis patients

Public title

study of transcranial magnetic stimulation effect on motor imagery rehabilitation and movement improvment in multiple sclerosis patients

Purpose

Treatment

Inclusion/Exclusion criteria

All patients (20 to 40 years old) met the Mc Donald criteria for diagnosis of MS.All of them belong to relapsing remitting MS subgroup. The study exclusion criteria included patients with EDSS > 3.5; new clinical attack during 3 months prior to the study; other

neurological diseases (stroke, seizure, etc.); head trauma, chronic psychiatric disorder. Patients were right-handed based on the Edinburgh Handedness Inventory. Fatigue score based on Fatigue Severity Scale questionnaire should be less than 37. Depression score based on Beck Depression questionnaire should be less than 21. Mini mental state examination score should be more than 24.

Age

From **20 years** old to **40 years** old

Gender

Both

Phase

N/A

Groups that have been masked

No information

Sample size

Target sample size: **50**

Randomization (investigator's opinion)

Randomized

Randomization description**Blinding (investigator's opinion)**

Double 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 Kerman University of Medical Science

Street address

Ebn Sina St.

City

Kerman

Postal code

7619813159

Approval date

2012-11-10, 1391/08/20

Ethics committee reference number

91/270/15

Health conditions studied**1****Description of health condition studied**

multiple sclerosis

ICD-10 code

G35

ICD-10 code description**Primary outcomes****1****Description**

mental rotation ability

Timepoint

befor rTMS implementation and after the 10th rTMS session

Method of measurement

Reaction time and accuracy (percent of correct response) were recorded

2**Description**

upper limb imagery chronometry

Timepoint

before rTMS implementation and after the 10th rTMS session

Method of measurement

(real performance-motor imagery)/real performance

3**Description**

upper limb function

Timepoint

before rTMS implementation and after the 10th rTMS session

Method of measurement

number of moved blocks in 1 minute

4**Description**

upper limb function

Timepoint

before rTMS implementation and after the 10th rTMS session

Method of measurement

recorded time for moving nine pegs

5**Description**

lower limbs function

Timepoint

before rTMS implementation and after the 10th rTMS session

Method of measurement

recorded time for walking 25 foots

Secondary outcomes**1****Description**

PASAT score

Timepoint

before rTMS implementation and after the 10th rTMS session

Method of measurement
total number of accurate sum

2

Description
motor and visual imagery vividness

Timepoint
before rTMS implementation

Method of measurement
kinesthetic and visual imagery questionnaire

3

Description
global cognitive function

Timepoint
before rTMS implementation

Method of measurement
mini mental state examination

4

Description
depression score

Timepoint
before rTMS implementation

Method of measurement
beck depression questionnaire

5

Description
fatigue score

Timepoint
before rTMS implementation

Method of measurement
fatigue Severity scale questionnaire

6

Description
SDMT score

Timepoint
before rTMS implementation and after the 10th rTMS session

Method of measurement
number of correct digits in 90 second

7

Description
Brief visuospatial memory test-revised score

Timepoint
before rTMS implementation and after the 10th rTMS session

Method of measurement
number of correct responses after 25 minutes

8

Description
judgment of line orientation score

Timepoint
before rTMS implementation and after the 10th rTMS session

Method of measurement
number of correct angles

Intervention groups

1

Description
Intervention: transcranial magnetic stimulation. Duration: 10 sessions(5 sessions in one week and other 5 sessions in next week).

Category
Rehabilitation

2

Description
Control: no treatment

Category
N/A

Recruitment centers

1

Recruitment center

Name of recruitment center

Besat clinic

Full name of responsible person

Dr. Farhad Iranmanesh

Street address

Ebn Sina St.

City

Kerman

Sponsors / Funding sources

1

Sponsor

Name of organization / entity

Kerman medical university-dean of research

Full name of responsible person

sedigheh khezri

Street address

Ebn Sina St.

City

Kerman

Grant name

Grant code / Reference number

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

Yes

Title of funding source

Kerman medical university-dean of research

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***City**

Kerman

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Web page address**Person responsible for general inquiries****Contact****Name of organization / entity**

Kerman Neuroscience Research Center

Full name of responsible person

Nasser Zangiabadi

Position

Assistant professor of neurology

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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*