Clinical Trial Protocol
Iranian Registry of Clinical Trials

18 Nov 2026

Effect of 10 Hz repetitive transcranial magnetic stimulation (rTMS) over left dorsolateral prefrontal cortex compared with sham rTMS on working memory capacity of healthy subjects

Protocol summary

Summary

The aim of this study is to evaluate the effect of rTMS on enhancement of working memory capacity in healthy individuals. Right handed healthy subjects from available population who do not have any contraindication of receiving TMS will participate in our study. After preliminary screening tests (GHQ28) they will equally assign to either active TMS or sham TMS groups in a randomized and double blind way. To measure baseline performance of working memory in each group, subjects will perform a number of working memory tests that measure different aspects of storage and manipulation of information. The intervention protocol will consist of 10 sessions of 10 Hz rTMS stimulation with the intensity of 100% of motor threshold, over the left dorsolateral prefrontal cortex. Sham stimulation will be delivered using the same parameters as active rTMS, but the coil will be angled 45 degrees away from the skull in a single-wing tilt position towards anterior. This way produces sensation similar to those of active stimulation, but with minimal direct brain effects. 3- 5 days after the last session of intervention, the same behavioral tests will be repeated for both groups.

General information

Acronym

IRCT registration information

IRCT registration number: **IRCT201305131958N4**
Registration date: **2014-12-13, 1393/09/22**
Registration timing: **retrospective**

Last update:
Update count: **0**

Registration date

2014-12-13, 1393/09/22

Registrant information

Name
Seyed Vahid Shariat
Name of organization / entity
Tehran Univeristy of Medical Sciences
Country
Iran (Islamic Republic of)
Phone
+98 21 6650 6862
Email address
shariatv@iums.ac.ir

Recruitment status

Recruitment complete

Funding source

Institute for Cognitive Science Studies.

Expected recruitment start date

2013-06-01, 1392/03/11

Expected recruitment end date

2014-06-01, 1393/03/11

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

Effect of 10 Hz repetitive transcranial magnetic stimulation (rTMS) over left dorsolateral prefrontal cortex compared with sham rTMS on working memory capacity of healthy subjects

Public title

Effect of rTMS on working memory

Purpose

Basic scienece

Inclusion/Exclusion criteria

Inclusion: voluntary and competent to consent; voluntary

and competent to consent; between the ages of 18-65; considered a healthy individual free of psychopathology based on the General Health Questionnaire (GHQ28); right-handed determined modified version of the Edinburgh Handedness Inventory; self-reported non-smoker; Exclusion: Any kind of metal implement in head and body; Have a history of substance abuse; Have a medical or neurological illness; Have a history of seizures; Have a first degree relative with a history of a seizure disorder; pregnancy in female subjects.

Age
From **18 years** old to **65 years** old

Gender
Both

Phase
2-3

Groups that have been masked
No information

Sample size
Target sample size: **30**

Randomization (investigator's opinion)
Randomized

Randomization description

Blinding (investigator's opinion)
Double blinded

Blinding description

Placebo
Used

Assignment
Parallel

Other design features

Secondary Ids

empty

Ethics committees

1

Ethics committee

Name of ethics committee
Tehran University of Medical Sciences

Street address
Tehran University of Medical Sciences, Ghods Street, Keshavarz Boulvard

City
Tehran

Postal code

Approval date
2014-10-20, 1393/07/28

Ethics committee reference number
19955

Health conditions studied

1

Description of health condition studied
working memory

ICD-10 code
Z76.9

ICD-10 code description
Person encountering health services in unspecified circumstances

Primary outcomes

1

Description
working memory capacity

Timepoint
Before and after intervention

Method of measurement
CANTAB cognitive tasks (Delay match to sample, spatial span, pattern recognition, stockings of cambridge) 2 back, digit span

Secondary outcomes

empty

Intervention groups

1

Description
Intervention: Active rTMS with 10 Hz stimulation with intensity of 100% motor threshold. Total stimulation of 600 pulse. (1 second stimulation and 5 second rest period) over the left dorsolateral prefrontal cortex

Category
Treatment - Other

2

Description
Control: Sham rTMS, Coil will have 45 degree angle from the the skull in a single-wing tilt position towards anterior. This way produces sensation similar to those of active stimulation, but with minimal direct brain effects.

Category
Treatment - Other

Recruitment centers

1

Recruitment center

Name of recruitment center
Iranian National Center for Addiction Studies (INCAS)

Full name of responsible person
Yasaman Bagherzadeh

Street address
486, below Qazvin Square, South Kargar Ave

City
Tehran

Sponsors / Funding sources

1

Sponsor
Name of organization / entity
Institute for Cognitive Science Studies
Full name of responsible person
Dr Zarindast
Street address
No 18, Pezeshkpour Alley, Valieasr Ave
City
Tehran
Grant name
Grant code / Reference number
Is the source of funding the same sponsor organization/entity?
Yes
Title of funding source
Institute for Cognitive Science Studies
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
Institute for Cognitive Science Studies
Full name of responsible person
Yasaman Bagherzadeh
Position
PhD student
Other areas of specialty/work
Street address
no 18, Pezeshkpour Alley, Valieasr Avenue
City
Tehran
Postal code
Phone
+98 21 7629 0907
Fax
Email
yass.bagherzadeh@gmail.com
Web page address

Person responsible for scientific inquiries

Contact
Name of organization / entity
Institute for Cognitive Science Studies, Iran University of Medical Sciences
Full name of responsible person
Seyed Vahid Shariat
Position
Associate Professor
Other areas of specialty/work
Street address
Tehran Institue of Psychiatry, Mansouri Lane, Niayesh Street, Sattarkhan Avenue
City
Tehran
Postal code
Phone
+98 21 6650 6862
Fax
Email
shariat.v@iums.ac.ir
Web page address

Person responsible for updating data

Contact
Name of organization / entity
Institute for Cognitive Science Studies
Full name of responsible person
Yasaman Bagherzadeh
Position
PhD student
Other areas of specialty/work
Street address
Institute for Cognitive Science Studies, No 18, Pezeshkpour Alley, Valiasr Avenue
City
Tehran
Postal code
Phone
Fax
Email
yass.bagherzadeh@gmail.com
Web page address

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