Clinical Trial Protocol
Iranian Registry of Clinical Trials

09 Nov 2026

Evaluating the Impact of Transcranial Direct Current Stimulation (tDCS) on Cognitive Functions (Auditory and Visual Memory, and Sustained Attention) in Brain Tumor Patients Undergoing Radiotherapy

Protocol summary

Study aim
Evaluating the Impact of Transcranial Direct Current Stimulation (tDCS) on Cognitive Functions (Auditory and Visual Memory, and Sustained Attention) in Brain Tumor Patients Undergoing Radiotherapy

Design
The study population will consist of 40 brain cancer patients referred to the Radiotherapy Department of Shahid Madani Hospital in Tabriz during 1403–1404, 20 patients will be as the intervention group, and 20 patients will be as the sham group.

Settings and conduct
All patients will undergo cognitive assessments before and after whole-brain radiotherapy by QEEG and cognitive tasks including the CPT and the N-back task. During radiotherapy, non-invasive tDCS method will be used.

Participants/Inclusion and exclusion criteria
Patients with brain tumors, Informed consent of the patients to participate in the present study, No prior exposure to similar intervention programs, The patient must be right-handed Exclusion Criteria: unwillingness to continue participation

Intervention groups
Whole-brain radiotherapy - Transcranial electrical stimulation (tES)

Main outcome variables
After completing the 20-day course of radiotherapy, the use of tDCS will finish, and the data obtained from QEEG and cognitive tasks will be analyzed and compared by statistical methods. Based on the QEEG test results, the cognitive functions of patients in the experimental group are expected to be better than those in the sham group.

General information

Reason for update

Acronym

IRCT registration information
IRCT registration number: **IRCT20250310065009N1**
Registration date: **2025-07-17, 1404/04/26**
Registration timing: **registered_while_recruiting**

Last update: **2025-07-17, 1404/04/26**
Update count: **0**

Registration date
2025-07-17, 1404/04/26

Registrant information

Name
Leila Halavi

Name of organization / entity

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Iran (Islamic Republic of)

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+98 41 3553 3431

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Recruitment status
Recruitment complete

Funding source

Expected recruitment start date
2025-06-02, 1404/03/12

Expected recruitment end date
2025-08-03, 1404/05/12

Actual recruitment start date
empty

Actual recruitment end date
empty

Trial completion date
empty

Scientific title
Evaluating the Impact of Transcranial Direct Current

Stimulation (tDCS) on Cognitive Functions (Auditory and Visual Memory, and Sustained Attention) in Brain Tumor Patients Undergoing Radiotherapy

Public title
The effect of tDCS on cognition (memory and attention) and QEEG indices (β/θ) in brain tumor patients undergoing radiotherapy
Purpose
Treatment
Inclusion/Exclusion criteria
Inclusion criteria:
Patients with brain tumors undergoing radiotherapy Informed consent of the patients to participate in the present study No prior exposure to similar intervention programs The patient must be right-handed
Exclusion criteria:
Second course of radiotherapy
Age
No age limit
Gender
Both

Phase
N/A
Groups that have been masked

- Participant

Sample size
Target sample size: **40**
Randomization (investigator's opinion)
Not randomized
Randomization description
Blinding (investigator's opinion)
Single blinded
Blinding description
All patients were connected to a brain stimulation device, and the sham group was unaware of the absence of electrical current.
Placebo
Not used
Assignment
Single
Other design features

Secondary Ids

empty

Ethics committees

1

Ethics committee
Name of ethics committee
Ethics committee of Tabriz University of Medical Sciences
Street address
No. 35, AflakNoma Building, 10 meters east of the first, Zafaranieh
City
Tabriz
Province
East Azarbaijan
Postal code
7946676516
Approval date
2024-10-13, 1403/07/22
Ethics committee reference number
IR.TABRIZU.REC.1403.107

Health conditions studied

1

Description of health condition studied
brain tumor
ICD-10 code
C71.9
ICD-10 code description
Malignant neoplasm of brain, unspecified

Primary outcomes

1

Description
Transcranial DCS (tDCS)
Timepoint
30 minutes a day for 20 sessions
Method of measurement
The anode electrode will be placed on the left and right supraorbital with direct current stimulation and the cathode on the opposite cerebellum with a current intensity of 2 mA.

Secondary outcomes

1

Description
Behavioral level (individuals' scores on memory and attention tasks)
Timepoint
he subjects' scores on memory and attention tasks were measured once before the radiotherapy sessions and once after the session.
Method of measurement
Patients are cognitively assessed using the Continuous Performance Test (CPT) and N-back cognitive tasks.

2

Description
Electrophysiological level (quantitative electroencephalography index, teta and beta frequency bands)
Timepoint
Measurements were taken once before radiotherapy sessions and once after the session.
Method of measurement
The absolute power of the theta and beta frequency bands is calculated by NeuroGuide software.

Intervention groups

1

Description
Intervention group: Transcranial direct Current Stimulation (tDCS)-
Category
Rehabilitation

2

Description
Control group: Placing the tDCS device on the patient's head without stimulation
Category
Rehabilitation

Recruitment centers

1

Recruitment center
Name of recruitment center
Shahid Madani Hospital of Tabriz , Valiasr Hospital of Tabriz
Full name of responsible person
Dr. Hassan Sabouri Moghadam, Dr. Amir Ghasemi Jangoj
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Daneshgah street
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1557351666
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Sponsors / Funding sources

1

Sponsor
Name of organization / entity
Aras Jolfa Campus
Full name of responsible person
Dr. Hassan Sabouri Moghadam
Street address
Imam Khomeini Boulevard
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Province
East Azarbaijan
Postal code
5441656498
Phone
+98 41 4202 4824
Email
aras.executive@ut.ac.ir
Grant name
Grant code / Reference number
Is the source of funding the same sponsor organization/entity?
Yes
Title of funding source
Aras Jolfa Campus
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
Pardis Aras Jolfa
Full name of responsible person
Leila Halavi Anjar
Position
Ph.D student
Latest degree
Master
Other areas of specialty/work
Neuroscience
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Person responsible for updating data

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Sharing plan

Deidentified Individual Participant Data Set (IPD)
Undecided - It is not yet known if there will be a plan to make this available

Study Protocol
Undecided - It is not yet known if there will be a plan to make this available

Statistical Analysis Plan
Undecided - It is not yet known if there will be a plan to make this available

Informed Consent Form
Yes - There is a plan to make this available

Clinical Study Report
Yes - There is a plan to make this available

Analytic Code
Not applicable

Data Dictionary
Not applicable

Title and more details about the data/document
QEEG indices, beta and theta frequency bands

When the data will become available and for how long
Data cannot be accessed until the article is published.

To whom data/document is available
Only a reliable and responsible person

Under which criteria data/document could be used
After publication of the article, the data will be available in the form of QEEG files and cognitive test scores.

From where data/document is obtainable
leilahalavi@tabrizu.ac.ir

What processes are involved for a request to access data/document
After the article is printed, if needed, the files will be made available to the requesting researcher by sending an email.

Comments