

Clinical Trial Protocol

Iranian Registry of Clinical Trials

11 Sep 2026

The Effect of Neuromuscular Exercises with Respiratory Control on Total Oxidant and Antioxidant Capacity, Mental and Motor Performance in Elderly Stroke Patients

Protocol summary

Study aim

The Effect of Neuromuscular Exercises with Respiratory Control on Total Oxidant and Antioxidant Capacity, Mental and Motor Performance in Elderly Stroke Patients

Design

Clinical trial with a control group, parallel-group trial, single-blinded, randomized, phase 2 clinical trial on 30 patients. Opaque envelopes will be used for randomization.

Settings and conduct

Thirty men and women with an ischaemic stroke will be selected from Hashrood and randomly assigned to two experimental groups and a control group. The outcome assessor and statistical analyst will be blinded to group assignments. Variables will be measured at two time points: before and after the 8-week exercise protocol

Participants/Inclusion and exclusion criteria

Age range 61 to 75 years, both male and female, experiencing their first ischemic stroke. Cognitive status score of 23 or higher, Berg Balance Scale score between 30 and 44, the ability to stand unassisted, and the ability to walk without a cane. Education level of middle school or higher. No dizziness or balance disorders during testing and training. No other chronic conditions affect balance and movement during testing and training.

Intervention groups

Intervention group: Participants will undergo eight weeks of neuromuscular training combined with breath control, with three sessions per week, each lasting 60 to 90 minutes, in addition to a routine rehabilitation programme. Control group: only the routine rehabilitation programme.

Main outcome variables

Total oxidative capacity, total antioxidant capacity, balance, Mental performance, isometric strength, VO2peak

General information

Reason for update

Acronym

IRCT registration information

IRCT registration number: **IRCT20160523028028N5**

Registration date: **2025-11-15, 1404/08/24**

Registration timing: **prospective**

Last update: **2025-11-15, 1404/08/24**

Update count: **0**

Registration date

2025-11-15, 1404/08/24

Registrant information

Name

Azam Zarneshan

Name of organization / entity

Azərbaycan Şahid Mədanı Universiteti

Country

Iran (Islamic Republic of)

Phone

+98 41 3432 7505

Email address

zarneshan@azaruniv.ac.ir

Recruitment status

Recruitment complete

Funding source

Expected recruitment start date

2025-12-06, 1404/09/15

Expected recruitment end date

2026-01-05, 1404/10/15

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title
The Effect of Neuromuscular Exercises with Respiratory Control on Total Oxidant and Antioxidant Capacity, Mental and Motor Performance in Elderly Stroke Patients

Public title
The Effect of physical activity with Respiratory Control on, Mental and Motor health of Elderly Stroke Patients

Purpose
Supportive

Inclusion/Exclusion criteria
Inclusion criteria:
Achieving a score of 23 or higher on the cognitive status test and 30 to 44 on the Berg Balance Scale , the ability to stand unassisted for at least eight minutes, walk without a cane having at least a middle school education. Patients with ischemic stroke
Exclusion criteria:
Experiencing dizziness and difficulty standing during tests and exercises. Uncontrolled epileptic seizures
Having Parkinson's or other chronic diseases that cause balance and movement disorders during tests and exercises.

Age
From **61 years** old to **75 years** old

Gender
Both

Phase
N/A

Groups that have been masked

- Outcome assessor
- Data analyser

Sample size
Target sample size: **30**

Randomization (investigator's opinion)
Randomized

Randomization description
Simple randomization method will be used. Allocation concealment will be conducted by a researcher not involved in the study. Opaque, identical, sealed envelopes will be prepared, containing the type of intervention according to a randomly generated allocation sequence. The envelopes, numbered from 1 to 30, will be distributed based on the order of participants entering the study.

Blinding (investigator's opinion)
Single blinded

Blinding description
The outcome assessor will be blinded to the group differences in both pre-test and post-test phases. The data analyst will also be blinded to the group differences, and the groups will be entered into SPSS with codes 1 and 2.

Placebo
Not used

Assignment
Parallel

Other design features

Secondary Ids

empty

Ethics committees

1

Ethics committee

Name of ethics committee

کمیته اخلاق دانشگاه شهید مدنی آذربایجان

Street address

خیابان ورزش

City

تبریز

Province

East Azarbaijan

Postal code

5541916777

Approval date

2025-11-04, 1404/08/13

Ethics committee reference number

IR.AZARUNIV.REC.1404.028

Health conditions studied

1

Description of health condition studied

stroke

ICD-10 code

I63

ICD-10 code description

Cerebral infarction

Primary outcomes

1

Description

balance performance

Timepoint

Before and after 8 weeks of training protocol

Method of measurement

Berg Balance Scale

2

Description

Total Oxidant Status (TOS)

Timepoint

Before and after 8 weeks of training protocol

Method of measurement

ELISA (TOS kit -Navan Salamat)

3

Description

Total Antioxidant Capacity (TAC)

Timepoint

Before and after 8 weeks of training protocol

Method of measurement

ELISA (Naxifer™ -Total Antioxidant Capacity Assay Kit-TAC)

4

Description

Vo2peak

Timepoint

Before and after 8 weeks of training protocol

Method of measurement

6-Minute Walk Test

5

Description

Isometric strength

Timepoint

Before and after 8 weeks of training protocol

Method of measurement

Dynamometer

6

Description

Mental performance

Timepoint

Before and after 8 weeks of training protocol

Method of measurement

Mini-Mental State Examination

Secondary outcomes

empty

Intervention groups

1

Description

Intervention group: In addition to routine rehabilitation, participants performed combined exercises for 8 weeks, with three sessions per week, each lasting 60 to 90 minutes. Each session included a warm-up with stretching exercises (10 minutes), continuous walking on a line (10 to 15 minutes), fall-resistance training (15 to 20 minutes), PNF exercises for motor function (15 to 20 minutes), and a cool-down with breathing exercises during the final 15 to 20 minutes.

Category

Lifestyle

2

Description

Control group: Routine rehabilitation program (including initial assessment to check physical condition, Common physical exercises at the rehabilitation center, education and lifestyle changes, including nutrition modification, smoking cessation, and stress management)

Category

Lifestyle

Recruitment centers

1

Recruitment center

Name of recruitment center

Sanateb Corrective Exercise Center

Full name of responsible person

Ismael Khairzadeh

Street address

Hashtroud, Imam Street, next to Mellat Bank

City

Hashtrud

Province

East Azarbaijan

Postal code

5571963311

Phone

+98 41 5262 4817

Email

saraasgharzadeh1998@gmail.com

Sponsors / Funding sources

1

Sponsor

Name of organization / entity

Azarbaijan Shahid Madani University

Full name of responsible person

Azam Zarneshan

Street address

Varzesh Ave

City

Tabriz

Province

East Azarbaijan

Postal code

5375171379

Phone

+98 41 3432 7505

Email

zarneshan@azaruniv.ac.ir

Grant name

Grant code / Reference number

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

Yes

Title of funding source

Azarbaijan Shahid Madani University

Proportion provided by this source

20

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

Azərbaycan Şahid Mədanı Universiteti

Full name of responsible person

Azam Zarnəshan

Position

Associate professor

Latest degree

Ph.D.

Other areas of specialty/work

Cardiovascular and respiratory exercise physiology

Street address

Varzesh Ave

City

Tabriz

Province

East Azarbaijan

Postal code

5541916777

Phone

+98 41 3145 2407

Email

zarneshan@azaruniv.ac.ir

Person responsible for scientific inquiries

Contact

Name of organization / entity

Azərbaycan Şahid Mədanı Universiteti

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Email

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Person responsible for updating data

Contact

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Sharing plan

Deidentified Individual Participant Data Set (IPD)

Yes - There is a plan to make this available

Study Protocol

Yes - There is a plan to make this available

Statistical Analysis Plan

Yes - There is 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

Yes - There is a plan to make this available

Data Dictionary

Yes - There is a plan to make this available

Title and more details about the data/document

Data collection will be done by the researchers and information about the main outcomes of the study will be published

When the data will become available and for how long

Access to the data will be possible immediately after the results are printed

To whom data/document is available

The general public, athletic trainers, Stroke patients, and researchers

Under which criteria data/document could be used

Reviewers of magazines and the Azarbaijan Shahid Madani University are allowed to send requests to receive non-identifiable personal data or other documents. Until the publication of the results in the form of an article, it is not allowed to perform statistical analysis on the delivered data.

From where data/document is obtainable

Dr. Azam Zarneshan email: zarneshan@azaruniv.ac.ir

What processes are involved for a request to access data/document

via email to the corresponding author: Dr. Azam Zarneshan zarneshan@azaruniv.ac.ir

Comments