Clinical Trial Protocol
Iranian Registry of Clinical Trials

07 Nov 2026

Effects of Ischemic Preconditioning on Delay of Forearm Pump in Elite Male Rock Climbers: A Randomized-Controlled Trial

Protocol summary

Study aim

The main aim of this study is to investigate the effect of ischemic preconditioning on delay of forearm pump in elite male rock climbers. Investigating the effect of this technique on physical performance and the systemic effects caused by it are among the secondary goals.

Design

A randomized, parallel-group, controlled clinical trial on 16 rock climbers with blinded data analyst. Randomization will be done by sealed envelope.

Settings and conduct

Participants reported to the climbing gym on two separate occasions with an interval at least 48 hours. In the first session, they will perform 15 minutes of warm-up. After 10 minutes of passive rest, pre-intervention evaluations will be performed. In the second visit, after the intervention and 20 minutes of passive rest, everything will be performed in the same way as the first visit. The data analyst is blind due to the lack of knowledge of the groups.

Participants/Inclusion and exclusion criteria

All rock climbers aged between 16 to 40 years with at least 5 years of experience, especially in the lead, and climbing difficulty grade between 18 and 32 on the scale of the International Association of Rock Climbing Research, are eligible to enter the study. Existence of musculoskeletal and cardiovascular disorders, history of injury in the last 6 months, and cigarettes and drug consumption are conditions for not entering the study.

Intervention groups

In the ischemic preconditioning group, the blood flow restricting cuff is placed around the dominant arm in the supine position and is inflated in 3 cycles of 5 minutes of ischemia (220 mm Hg) followed by 5-minute of cuff deflation and reperfusion. In the control group, the cuff is applied for the same period (30 minutes) with a pressure of 0 mmHg.

Main outcome variables

Time to fatigue; Maximum strength ; Microvascular factors; Forearm girth; Blood lactate level; Physical performance

General information

Reason for update

Acronym

IRCT registration information

IRCT registration number: **IRCT20240315061295N1**
Registration date: **2024-04-04, 1403/01/16**
Registration timing: **prospective**

Last update: **2024-04-04, 1403/01/16**
Update count: **0**

Registration date

2024-04-04, 1403/01/16

Registrant information

Name
Zahra Yaghmayee
Name of organization / entity
Tarbiat Modares University
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Iran (Islamic Republic of)
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Recruitment status

Recruitment complete

Funding source

Expected recruitment start date

2024-05-21, 1403/03/01

Expected recruitment end date

2024-08-21, 1403/05/31

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

Effects of Ischemic Preconditioning on Delay of Forearm Pump in Elite Male Rock Climbers: A Randomized-Controlled Trial

Public title

Effects of Ischemic Preconditioning on Delay of Forearm Muscles Fatigue in Rock climbing

Purpose

Prevention

Inclusion/Exclusion criteria

Inclusion criteria:

Have at least five years of climbing experience. The difficulty grading of their ascent should be between 18 and 32 according to the International Rock Climbing Research Association scale. The main field of activity of these people must be lead.

Exclusion criteria:

Existence of musculoskeletal and cardiovascular disorders that affect the intervention and assessments History of injury, especially in the upper limb in the last 6 months Use of cigarettes and drugs

Age

From **16 years** old to **40 years** old

Gender

Male

Phase

N/A

Groups that have been masked

- Data analyser

Sample size

Target sample size: **16**

Randomization (investigator's opinion)

Randomized

Randomization description

Individual Simple Randomization by Sealed Envelope

Blinding (investigator's opinion)

Single blinded

Blinding description

The data analyst does not know the group to which the people belong.

Placebo

Used

Assignment

Parallel

Other design features

Secondary Ids

empty

Ethics committees

1

Ethics committee

Name of ethics committee

Ethics committee of Tarbiat Modares University

Street address

Faculty of Medicine, Tarbiat Modares University, Jalal Al-Ahmad St.

City

Tehran

Province

Tehran

Postal code

1411713116

Approval date

2024-03-11, 1402/12/21

Ethics committee reference number

IR.MODARES.REC.1402.256

Health conditions studied

1

Description of health condition studied

forearm pump

ICD-10 code

ICD-10 code description

Primary outcomes

1

Description

Time to fatigue

Timepoint

baseline and after intervention

Method of measurement

Specific device for measuring the finger flexors' strength

Secondary outcomes

1

Description

Maximum strength

Timepoint

Baseline and after intervention

Method of measurement

Specific device for measuring finger flexors' strength

2

Description

Microvascular factors

Timepoint

Baseline and after intervention

Method of measurement

Near infrared spectroscopy

3

Description

Blood lactate level

Timepoint

Baseline and after intervention

Method of measurement

Lactometer

4

Description
Forearm girth
Timepoint
Baseline and after intervention
Method of measurement
Tape measure

5

Description
Physical performance variables
Timepoint
Baseline and after intervention
Method of measurement
Tape measure

Intervention groups

1

Description
Intervention group: In this group, the blood flow restricting cuff will be placed proximally around the dominant arm of the participant for 30 minutes. In this period of time, the cuff is inflated in 3 cycles of 5 minutes of ischemia with a pressure of 220 mm Hg, in order to create a complete blockage in the arterial blood flow. Ischemic cycles are separated by 5 minute intervals of cuff deflation and reperfusion.
Category
Prevention

2

Description
Control group: In this group, the blood flow restricting cuff will be placed proximally around the dominant arm of the participant for 30 minutes. In this period of time, the cuff is applied in 3 cycles of 5 minutes with a pressure of 0 mm Hg. These cycles are separated by 5 minute intervals of opening the cuff.
Category
Placebo

Recruitment centers

1

Recruitment center
Name of recruitment center
Payam Climbing Academy
Full name of responsible person
Mohammed Najafi Ashtiani
Street address
in front of Andisheh Park, above the Qasr intersection, Shariati Street
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Sponsors / Funding sources

1

Sponsor
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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
Tarbiat Modares University
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
Tarbiat Modares University
Full name of responsible person
Mohammed Najafi Ashtiani
Position
Assistant professor
Latest degree
Ph.D.
Other areas of specialty/work

Physiotherapy

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Person responsible for scientific inquiries

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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
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
All personal data of participants can be shared after de-identification. In addition, the study protocol, statistical analysis, informed consent form and reports of the study will be shared.

When the data will become available and for how long
6 months after publication by contacting the corresponding author

To whom data/document is available
Researchers working in academic and scientific institutions

Under which criteria data/document could be used
For meta-analysis Biomechanics simulation or any other type of usage with the researchers' discernment

From where data/document is obtainable
Contact the corresponding author of the article

What processes are involved for a request to access data/document
Contact the corresponding author of the article Meeting the requirements of users (being a researcher) Document submission

Comments