Clinical Trial Protocol
Iranian Registry of Clinical Trials

08 Jul 2026

The effect of different doses of caffeine consumption on EMG activity variables and muscle fatigue index in response to maximal anaerobic test in healthy women

Protocol summary

Study aim

Identifying the best dose of caffeine for maximum effect on the performance of athletes and non-athletes and preventing excessive and unnecessary caffeine consumption.

Design

The study with within-group, counterbalanced and double-blind design, 16 subjects will consume different doses of caffeine and placebo in four sessions and complete the same test.

Settings and conduct

In each session (ten-day intervals) with the presence of two subjects in the laboratory of Razi University, each subject is given one of the three studied doses of caffeine or placebo (without the knowledge of the subject and the researcher), by the assistant of the researcher, which is different from the other subject and from the previous and the next session. After warming up, she will complete three 30-second Wingate tests with four-minute rest, and after that, the maximum voluntary contraction of the rectus femoris and latissimus dorsi muscles will be measured during four periods with rest intervals of 5, 10, 15, and 30 minutes. Finally, the effect of each of the three doses of caffeine and placebo on the fatigue index and EMG amplitude of the mentioned muscles, each subject will be compared with himself and other subjects.

Participants/Inclusion and exclusion criteria

Age range 18 to 30 years Body mass index (BMI) 18.5 to 24.9 kg per square meter of height Acquaintance and implementation of anaerobic exercises Obtaining a certificate of non-prohibition of participation in sports training program from the doctor No use of tobacco, no use of medicine No vigorous exercise 48 hours before the test

Intervention groups

This study is in the form of intragroup and mutual balance, and the subjects will receive three different doses of caffeine and placebo during four sessions in the laboratory.

Main outcome variables

Change in anaerobic performance, pressure perception, electromyography, change in recovery time.

General information

Reason for update

Acronym

IRCT registration information

IRCT registration number: **IRCT20230622058558N1**
Registration date: **2023-09-02, 1402/06/11**
Registration timing: **registered_while_recruiting**

Last update: **2023-09-02, 1402/06/11**
Update count: **0**

Registration date

2023-09-02, 1402/06/11

Registrant information

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Name of organization / entity
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Recruitment status

Recruitment complete

Funding source

Expected recruitment start date

2023-07-22, 1402/04/31

Expected recruitment end date
2023-10-20, 1402/07/28
Actual recruitment start date
empty
Actual recruitment end date
empty
Trial completion date
empty

Scientific title
The effect of different doses of caffeine consumption on EMG activity variables and muscle fatigue index in response to maximal anaerobic test in healthy women

Public title
The effect of caffeine on anaerobic performance and fatigue caused by it
Purpose
Supportive
Inclusion/Exclusion criteria
Inclusion criteria:
Age range 18 to 30 years No vigorous exercise 48 hours before the test No use of tobacco, no use of medicine Obtaining a certificate of non-prohibition of participation in sports training program from the doctor Acquaintance and implementation of anaerobic exercises Body mass index (BMI) 18.5 to 24.9 kg per square meter of height
Exclusion criteria:
Suffering from various cardiovascular, pulmonary and metabolic diseases History of seizures, epilepsy or other types of neurological diseases The presence of implantable devices or pacemakers in the body Use of drugs or psychotropic substances and alcoholic beverages
Age
From **18 years** old to **30 years** old
Gender
Female

Phase
1-2
Groups that have been masked

- Participant
- Investigator

Sample size
Target sample size: **16**
Randomization (investigator's opinion)
N/A
Randomization description
Blinding (investigator's opinion)
Double blinded
Blinding description
In each test session, two subjects are present in the laboratory and tablets containing different doses of caffeine in the same dimensions and shapes are given to the subjects by a person other than the subjects and the researcher who knows the dose of the tablets, and the number It records the session and dosage of each subject with date and time. Then, by performing the test protocol, the information is collected and recorded by the researcher. After the completion of all four test sessions and data analysis based on session number and date, each data is attributed to its respective dose.
Placebo
Used
Assignment
Parallel
Other design features

Secondary Ids

empty

Ethics committees

1

Ethics committee
Name of ethics committee
Razi University Research Ethics Committee
Street address
Room 73, Faculty of Sports Sciences, Razi University, University Street, Taqbestan, Kermanshah,Iran
City
Kermanshah
Province
Kermanshah
Postal code
6714414971
Approval date
2022-06-18, 1401/03/28
Ethics committee reference number
IR.RAZI.REC.1401.018

Health conditions studied

1

Description of health condition studied
This study is conducted on healthy women
ICD-10 code
ICD-10 code description

Primary outcomes

1

Description
Changes in anaerobic performance
Timepoint
During and after each 30-second Wingate test
Method of measurement
Using the standard Wingate 30 second lower body test

Secondary outcomes

1

Description
The maximum amount of voluntary contraction
Timepoint
After three 30-second Wingate tests with 5, 10, 15, and 30 minute rest intervals.

Method of measurement
16-channel wireless electromyography

2

Description
Pressure
Timepoint
During and after each lower body Wingate test
Method of measurement
Using the 6-20 Borg pressure perception scale

Intervention groups

1

Description
Intervention group: Intervention group: In this research, all the subjects will complete three test sessions (with ten days intervals) in the laboratory by consuming three doses of low, medium and high caffeine. The test protocol is completely similar in all sessions, and each subject is required to perform three 30-second test sessions with 4-minute rest intervals. During the test, the amount of muscle contractions of the right thigh muscles and the lateral width of their upper leg is measured and recorded by an electromyography device. Also, after performing the three-step Wingate test, the maximum voluntary contraction of the muscles mentioned above is measured with rest intervals of 5, 10, 15 and 30 minutes.
Category
Treatment - Drugs

2

Description
Control group: In this research, all the subjects participate in a control session with a pill containing a placebo in addition to the three intervention sessions. All the details of the implementation of the protocol in the control mode will be similar to the intervention mode, with the difference that in the control mode, a tablet containing an ineffective substance (dextrose) will be given to the subjects.
Category
Placebo

Recruitment centers

1

Recruitment center
Name of recruitment center
Faculty of Sports Sciences, Razi University
Full name of responsible person
Worya Tahmasebi
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Sponsors / Funding sources

1

Sponsor
Name of organization / entity
Razi University
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Faculty of Sports Sciences, Razi University, University Street, Taqbestan, Kermanshah,Iran
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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
Razi 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
Razi University
Full name of responsible person
Seyde Hakime Hosseinimoghadam
Position
Student
Latest degree
Bachelor
Other areas of specialty/work
Physiology

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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
Not applicable
Informed Consent Form
Undecided - It is not yet known if there will be 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
All data can be shared after de-identifying subjects.
When the data will become available and for how long
3 months after printing the results
To whom data/document is available
All people upon official request
Under which criteria data/document could be used
Requesting access to data for any purpose is permitted.
From where data/document is obtainable
If you need to receive documents, send an email to Seyyed Hakime Hosseini Moghadam, with the email address: hakime.hosainimoghadam@gmail.com.
What processes are involved for a request to access data/document
In case of an official request, stating the relevant reasons and mentioning the complete details, the data will be sent via email after 72 hours.
Comments