

Clinical Trial Protocol

Iranian Registry of Clinical Trials

16 Sep 2026

Acute effect of Citrulline malate oral Supplementation on upper-body resistance performance, blood pressure and post exercise hypotension in resistance trained men

Protocol summary

Study aim

Comparison of acute effects of two doses (8 and 12 grams) of citrulline malate oral supplement on upper body resistance performance, blood pressure and post-exercise hypotension in resistance trained men.

Design

Acutely, in the form of a double-blind cross-over and balanced design with placebo, 12 male volunteers did resistance training randomly in three groups of 4 (group 1: citrulline malate dose 8, group 2: citrulline malate dose 12 and group 3: placebo) in each session, each subject randomly receives one of the three complementary interventions. Blood pressure and heart rate were taken before and after each session, and factors related to resistance training performance were also recorded in each session.

Settings and conduct

Venue of research meetings: World of Power Club (Ravansar Iran)

Participants/Inclusion and exclusion criteria

Entry criteria: history of resistance training at least 3 sessions per week in the last 6 months, body mass index from 18.5 to 29.99 (kg/m²) exclusion criteria: smoking. Taking any sports supplement in the two months before the start of the research

Intervention groups

1. citrulline malate (8 grams) 2. citrulline malate 12 grams) 3. placebo (dextrose 10 grams)

Main outcome variables

Maximum power; blood pressure; heart beat ; Post-exercise blood pressure drop

General information

Reason for update

Acronym

IRCT registration information

IRCT registration number: **IRCT20221122056581N1**

Registration date: **2022-12-05, 1401/09/14**

Registration timing: **prospective**

Last update: **2022-12-05, 1401/09/14**

Update count: **0**

Registration date

2022-12-05, 1401/09/14

Registrant information

Name

Mohammad amin Nori

Name of organization / entity

The University of Razi

Country

Iran (Islamic Republic of)

Phone

+98 83 4652 5548

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mohammadaminnoori71@gmail.com

Recruitment status

Recruitment complete

Funding source

Expected recruitment start date

2022-12-27, 1401/10/06

Expected recruitment end date

2023-01-26, 1401/11/06

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

Acute effect of Citrulline malate oral Supplementation on upper-body resistance performance, blood pressure and

post exercise hypotension in resistance trained men

Public title
The effect of supplementation with citrulline malate on resistance training performance

Purpose
Basic science

Inclusion/Exclusion criteria
Inclusion criteria:
1. Athletes should be boys from the gym 2. The place of residence in the city of Ravansar 3. Age range from 21 to 39 years 4. Body mass index between 18.5 and 29.99 5. Having general health to participate in sports activities with the doctor's approval 6. Regular resistance sports activity program in 6 months before the beginning of the research
Exclusion criteria:
1. Having any chronic disease 2. History of allergy and sensitivity 3. Taking any sports supplement in two months before the start of the research 4. Smoking and alcohol consumption 5. No history of high blood pressure and neurological diseases 6. History of participation in any research related to supplement consumption and resistance exercises before starting the research

Age
From **21 years** old to **39 years** old

Gender
Male

Phase
3

Groups that have been masked

- Participant
- Investigator

Sample size
Target sample size: **12**

Randomization (investigator's opinion)
Randomized

Randomization description
Due to the existence of three groups (citrulline malate dose 8, citrulline malate dose 12, and placebo), all the subjects (n=12) were divided into three equal groups (4 people in each group) using a random number table and randomly Simple will be placed in one of the groups. There are 3 possible sequences in which the participants can complete the study. That is (ABC, BCA, CAB) and based on the sample size (n=12), each sequence will be used exactly twice. The order of assigning the sequences to Participants will be determined using the Random Sequence Generator at WWW.RANDOM.ORG.

Blinding (investigator's opinion)
Double blinded

Blinding description
Because the study was double-blind, the study subjects and the researchers did not know who would take citrulline malate or a placebo, and someone else would check the results. Also, in order not to distinguish the drug and the placebo, they will be prepared in the same glasses and the placebo group will use dextrose.

Placebo
Used

Assignment

Other

Other design features
Since this research project aims to evaluate and compare the acute effect of supplementing two different doses of citrulline malate, considering the existence of three groups (citrulline malate dose 8, citrulline malate dose 12, and placebo), all subjects (n=12) using a table of random numbers, they will be divided into three equal groups (4 people in each group) and they will be placed in one of the groups in a simple random manner, and for three weeks, three acute research sessions with an interval of one week from each other, along with Receiving the relevant supplement will implement a resistance training protocol.

Secondary Ids

empty

Ethics committees

1

Ethics committee

Name of ethics committee

Ethics Committee of Razi University of Kermanshah

Street address

Razi University, University Street, Taq Bostan

City

Kermanshah

Province

Kermanshah

Postal code

6714414971

Approval date

2022-10-04, 1401/07/12

Ethics committee reference number

IR.RAZI.REC.1401.050

Health conditions studied

1

Description of health condition studied

Resistance exercise performance

ICD-10 code

ICD-10 code description

Primary outcomes

1

Description

Resistance sports performance

Timepoint

Three acute research sessions, one week apart

Method of measurement

Record the number of repetitions performed in each set of resistance exercise

Secondary outcomes

1

Description

Blood pressure and heart rate

Timepoint

Three acute research sessions, one week apart.

Method of measurement

Taking blood pressure and heart rate from each subject before and after each main research session

Intervention groups

1

Description

The first intervention group: supplementation with citrulline malate (8 grams) 60 minutes before the start of each main research session (resistance exercise) - in the acute phase of a single dose session

Category

Other

2

Description

The second intervention group: supplementation with citrulline malate (12 grams of citrulline malate) 60 minutes before the start of each main research session (resistance exercise) in the acute phase of one session and single dose

Category

Other

3

Description

Control group: third group: supplementation with placebo (10 grams of dextrose) 60 minutes before the start of each main research session (resistance exercise) - in the acute phase of a single dose session

Category

Other

Recruitment centers

1

Recruitment center

Name of recruitment center

World Power Gym

Full name of responsible person

Mohammad Amin Noori

Street address

No. 1259, Shahid Hasan Rezaei Alley, Molvi 3, Moalem Blvd.

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Sponsors / Funding sources

1

Sponsor

Name of organization / entity

Razi University of Kermanshah

Full name of responsible person

Dr. Ali Hirani

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info@razi.ac.ir

Web page address

<https://razi.ac.ir/>

Grant name

Grant code / Reference number

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

Yes

Title of funding source

Razi University of Kermanshah

Proportion provided by this source

100

Public or private sector

Private

Domestic or foreign origin

Domestic

Category of foreign source of funding

empty

Country of origin

Type of organization providing the funding

Other

Person responsible for general inquiries

Contact

Name of organization / entity

Razi University of Kermanshah

Full name of responsible person

Nasser Behpour

Position

Associate professor

Latest degree

Ph.D.

Other areas of specialty/work

Physiology

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Person responsible for scientific inquiries

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Sharing plan

Deidentified Individual Participant Data Set (IPD)

No - There is not a plan to make this available

Justification/reason for indecision/not sharing IPD

There is no further information.

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

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

Clinical Study Report

Not applicable

Analytic Code

Not applicable

Data Dictionary

Not applicable