

Clinical Trial Protocol

Iranian Registry of Clinical Trials

17 Sep 2026

Effects of a L-citrulline supplementation on nitric oxide and blood lactate in young women after a maximum exercise session

Protocol summary

Study aim

Effects of a L-citrulline supplementation on nitric oxide and blood lactate in young women after a maximum exercise session

Design

A randomised, placebo-controlled and double-blind design

Settings and conduct

The present study performed in vitro, in the laboratory of Exercise Physiology, the faculty of physical activity and sport sciences, Alzahra university. Subjects and researcher were blinded to the consumption of L-citrulline and placebo.

Participants/Inclusion and exclusion criteria

Inclusion criteria: subjects were physically healthy (no history of any cardiovascular disease, no history of specific or neuropsychiatric disease), no allergy to substances and drugs, no use of any dietary supplement, medication or nutritional regimen in the last 3 months, lack of regular exercises in the last 6 months.

Intervention groups

Intervention group: group of supplement consumed daily 6 grams capsules of powdered L-citrulline (NOW, USA) for one week. Control group: group of placebo consumed daily 6 grams capsules of powdered starch (Seiti, Iran) for one week.

Main outcome variables

Time to exhaustion, nitric oxide and blood lactate

General information

Reason for update

Acronym

IRCT registration information

IRCT registration number: **IRCT20181125041749N1**

Registration date: **2019-08-25, 1398/06/03**

Registration timing: **retrospective**

Last update: **2019-08-25, 1398/06/03**

Update count: **0**

Registration date

2019-08-25, 1398/06/03

Registrant information

Name

Fahimeh Kazemi

Name of organization / entity

Alzahra University

Country

Iran (Islamic Republic of)

Phone

+98 21 8569 2689

Email address

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Recruitment status

Recruitment complete

Funding source

Expected recruitment start date

2018-11-22, 1397/09/01

Expected recruitment end date

2019-01-21, 1397/11/01

Actual recruitment start date

2018-11-29, 1397/09/08

Actual recruitment end date

2019-02-01, 1397/11/12

Trial completion date

2019-02-01, 1397/11/12

Scientific title

Effects of a L-citrulline supplementation on nitric oxide and blood lactate in young women after a maximum exercise session

Public title

Effects of a L-citrulline supplementation on nitric oxide and lactate after exercise

Purpose

Treatment

Inclusion/Exclusion criteria

Inclusion criteria:

Subjects were physically healthy (no history of any cardiovascular disease, no history of specific or neuropsychiatric disease), no allergy to substances and drugs, no use of any dietary supplement, medication or nutritional regimen in the last 3 months, lack of regular exercises in the last 6 months.

Exclusion criteria:

Age

From **24 years** old to **29 years** old

Gender

Female

Phase

3

Groups that have been masked

- Participant
- Investigator

Sample size

Target sample size: **24**

Actual sample size reached: **24**

Randomization (investigator's opinion)

Randomized

Randomization description

Using the draw method, subjects' names were written on separate papers and placed in a container. Then the names of the subjects were randomly selected and placed in the intervention or placebo groups. The first 12 names were placed in the intervention group and the rest in the placebo group.

Blinding (investigator's opinion)

Double blinded

Blinding description

Researcher and subjects were not aware of the allocation of groups, and the supplement and placebo appearance was similar in both groups. An unrelated person to the study encoded the supplement and placebo.

Placebo

Used

Assignment

Parallel

Other design features

Secondary Ids

empty

Ethics committees

1

Ethics committee

Name of ethics committee

Ethics committee of Sports Sciences Research Institute

Street address

No. 3, 5th Alley, Miremad St., Motahhari St

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Postal code

1587958711

Approval date

2019-07-01, 1398/04/10

Ethics committee reference number

IR.SSRC.REC.1398.050

Health conditions studied

1

Description of health condition studied

Sports supplements

ICD-10 code

Y93.A

ICD-10 code description

Activities involving other cardiorespiratory exercise

Primary outcomes

1

Description

Time to exhaustion

Timepoint

Before the intervention and one week after the intervention

Method of measurement

With signs and symptoms of exhaustion

Secondary outcomes

1

Description

Nitric oxide

Timepoint

Before the intervention and one week after the intervention

Method of measurement

Elisa kit

2

Description

Blood lactate

Timepoint

Before the intervention and one week after the intervention

Method of measurement

Elisa kit

Intervention groups

1

Description

Intervention group: group of supplement consumed daily 6 grams capsules of powdered L-citrulline (NOW, USA) for one week.

Category

Treatment - Other

2**Description**

Control group: group of placebo consumed daily 6 grams capsules of powdered starch (Seiti, Iran) for one week.

Category

Treatment - Other

Recruitment centers**1****Recruitment center****Name of recruitment center**

Noor Pathobiology Laboratory

Full name of responsible person

Keyvan Majidi

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Sponsors / Funding sources**1****Sponsor****Name of organization / entity**

Alzahra University

Full name of responsible person

Yadollah Ordokhani

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ordokhani@alzahra.ac.ir

Grant name**Grant code / Reference number****Is the source of funding the same sponsor organization/entity?**

Yes

Title of funding source

Alzahra 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**

Alzahra University

Full name of responsible person

Fahimeh Kazemi

Position

Assistant Professor

Latest degree

Ph.D.

Other areas of specialty/work

Exercise Physiology

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Person responsible for scientific inquiries**Contact****Name of organization / entity**

Alzahra University

Full name of responsible person

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Position

Assistant Professor

Latest degree

Ph.D.

Other areas of specialty/work

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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

Not applicable

Analytic Code

Not applicable

Data Dictionary

Not applicable

Title and more details about the data/document

Data relating to subjects will be shared as unidentified.

When the data will become available and for how long

Six months after the publication of the article.

To whom data/document is available

All researchers

Under which criteria data/document could be used

Data is allowed to use in case of citing the reference.

From where data/document is obtainable

Atefeh Freidooni

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

By an email

Comments