

Clinical Trial Protocol

Iranian Registry of Clinical Trials

11 Sep 2026

The effect of combined exercises and the consumption of Mulberry leaf extract on the serum levels of alpha and beta salucin and some related inflammatory or cardiovascular markers in elderly men with type 2 diabetes

Protocol summary

Study aim

The effect of 8 weeks of combined exercises (aerobic and resistance) and the consumption of Mulberry leaf Extract on the serum levels of salusin alpha and beta and some cardiovascular inflammatory markers in elderly men with type 2 diabetes.

Design

The statistical population of the elderly with the age range of 60 to 70 years who referred to the diabetes center of Ardabil province. Phase 3. The sample size will be 40 people. Subjects will be placed in 5 groups, combined exercise group, exercise+supplement, supplement, placebo and control in a simple random manner and in pairs and individuals.

Settings and conduct

This study will be conducted as a 1-2 clinical trial. The combined training program (aerobic + resistance), for 8 weeks, will be three training sessions each week and each session will last 90 minutes with at least one day of rest between each session in the gym. Each training session includes a 10-minute warm-up period (including muscle stretching, walking) and aerobic exercises for 10 to 30 minutes with an intensity between 50 and 70% of the maximum strength, which will be calculated through the age-220 formula. After performing aerobic exercises, there is a rest between 3 and 5 minutes, and then resistance exercises are performed by the subjects for 30 to 40 minutes with an intensity between 40 and 70% of a maximum repetition. Resistance exercises include large upper body and lower body muscles, so that the participant can repeat each movement 8-12 times in each station.

Participants/Inclusion and exclusion criteria

Elderly men with type 2 diabetes

Intervention groups

Combined training group (aerobic + resistance),

combined training group + supplement, complementary group, placebo group, control group

Main outcome variables

salucin alpha, salucin beta, interleukin 6, interleukin 1 beta, glucose, insulin, insulin resistance, galectin 3, lipocalin 2

General information

Reason for update

Acronym

-

IRCT registration information

IRCT registration number: **IRCT20201128049510N1**

Registration date: **2022-12-07, 1401/09/16**

Registration timing: **registered_while_recruiting**

Last update: **2022-12-07, 1401/09/16**

Update count: **0**

Registration date

2022-12-07, 1401/09/16

Registrant information

Name

Mohammad Ebrahim Bahram

Name of organization / entity

The University of Mohaghegh Ardabili

Country

Iran (Islamic Republic of)

Phone

+98 45 3150 5297

Email address

mebahram@um.ac.ir

Recruitment status

Recruitment complete

Funding source

Expected recruitment start date

2022-11-17, 1401/08/26

Expected recruitment end date

2023-02-15, 1401/11/26

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

The effect of combined exercises and the consumption of Mulberry leaf extract on the serum levels of alpha and beta salucin and some related inflammatory or cardiovascular markers in elderly men with type 2 diabetes

Public title

The effect of exercise and Mulberry leaf extract on some cardiovascular inflammatory markers in the elderly with type 2 diabetes

Purpose

Prevention

Inclusion/Exclusion criteria**Inclusion criteria:**

Having type 2 diabetes between one and 10 years Not taking more than one type of oral anti-diabetic pill at night Having a basic level of glycosylated hemoglobin between 6.6 and 9.9% Having a fasting blood glucose of 160 to 250 mg/dL Ability to do sports Not participating in a regular exercise program for at least 6 months before the start of the study

Exclusion criteria:

Taking more than one type of oral anti-diabetic pill at night Smoking having cardiovascular, kidney and eye diseases, complications of diabetes (neuropathy, nephropathy, retinopathy) Treated with insulin

Age

From **60 years** old to **70 years** old

Gender

Male

Phase

3

Groups that have been masked

No information

Sample size

Target sample size: **40**

Randomization (investigator's opinion)

Randomized

Randomization description

In this research, the subjects are selected by simple random with the rule of random allocation. Thus, after determining the sample size, people will be equally placed in five groups (1-exercise, 2-exercise+supplement, 3- supplement, 4- placebo and 5-control). Using the lottery method, the names of the subjects are written on separate papers and placed in a container. Then the names of the subjects will be taken out randomly and they will be placed in the intervention, placebo and control groups respectively.

Blinding (investigator's opinion)

Not blinded

Blinding description**Placebo**

Used

Assignment

Parallel

Other design features**Secondary Ids**

empty

Ethics committees**1****Ethics committee****Name of ethics committee**

Ethics Committee of Mohaghegh Ardabili University, Faculty of Educational Sciences and Psychology

Street address

Ardabil, University Street, University of Mohaghegh Ardabili

City

Ardabil

Province

Ardabil

Postal code

1136756199

Approval date

2022-04-25, 1401/02/05

Ethics committee reference number

IR.UMA.REC.1401.002

Health conditions studied**1****Description of health condition studied**

Type 2 diabetes

ICD-10 code

E11

ICD-10 code description

Type 2 diabetes mellitus

Primary outcomes**1****Description**

Salusin alpha

Timepoint

24 hours before and 48 hours after training

Method of measurement

Blood sampling and using a laboratory kit

2**Description**

Salusin beta

Timepoint

24 hours before and 48 hours after training

Method of measurement

Blood sampling and using a laboratory kit

3

Description

Lipocalin 2

Timepoint

24 hours before and 48 hours after training

Method of measurement

Blood sampling and using a laboratory kit

4

Description

Galectin 3

Timepoint

24 hours before and 48 hours after training

Method of measurement

Blood sampling and using a laboratory kit

5

Description

Interleukin 6

Timepoint

24 hours before and 48 hours after training

Method of measurement

Blood sampling and using a laboratory kit

6

Description

Interleukin 1 beta

Timepoint

24 hours before and 48 hours after training

Method of measurement

Blood sampling and using a laboratory kit

7

Description

Insulin

Timepoint

24 hours before and 48 hours after training

Method of measurement

Blood sampling and using a laboratory kit

8

Description

Glucose

Timepoint

24 hours before and 48 hours after training

Method of measurement

Blood sampling and using a laboratory kit

Secondary outcomes

empty

Intervention groups

1

Description

Intervention group: Intervention group 1: Combined exercise (aerobic and resistance): Aerobic exercises will be performed for 10 to 30 minutes with an intensity between 50 and 70% of the maximum heart rate. Resistance exercises for 30 to 40 minutes with an intensity between 40 and 70 percent of a maximum repetition will be performed by the subjects.

Category

N/A

2

Description

Intervention group: Intervention group 2: Supplement group + daily exercise will consume 1000 mg (2 capsules of 500 mg), Mulberry leaf extract , 3 times a day along with combined exercises.

Category

N/A

3

Description

Intervention group: Intervention 3: The daily supplement group will take 1000 mg (2 capsules of 500 mg) of Mulberry leaf extract, 3 times a day.

Category

N/A

4

Description

Intervention group: Intervention 4: The placebo group will take 1000 mg daily (2 capsules of 500 mg), containing wheat flour, 3 times a day.

Category

N/A

5

Description

Control group: The control group will not participate in any exercise program.

Category

N/A

Recruitment centers

1

Recruitment center

Name of recruitment center

University of Mohaghegh Ardabili

Full name of responsible person

Mohammad Ebrahim Bahram

Street address

Ardabil, University Street, University of Mohaghegh Ardabili

City

Ardabil

Province
Ardabil
Postal code
1136756199
Phone
+98 913 262 7940
Email
bahramsport2010@gmail.com

Sponsors / Funding sources

1

Sponsor

Name of organization / entity
University of Mohaghegh Ardabili
Full name of responsible person
Roghayyeh Afroundeh
Street address
Ardabil, University Street, University of Mohaghegh
Ardabili
City
Ardabil
Province
Ardabil
Postal code
1136756199
Phone
+98 913 262 7940
Email
afroundeh@uma.ac.ir

Grant name

Grant code / Reference number

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

Yes

Title of funding source

University of Mohaghegh Ardabili

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
University of Mohaghegh Ardabili
Full name of responsible person
Roghayyeh Afroundeh
Position
Associate Professor
Latest degree
Ph.D.
Other areas of specialty/work

Physiology

Street address

Ardabil, University Street, University of Mohaghegh
Ardabili

City

Ardabil

Province

Ardabil

Postal code

8599156189

Phone

+98 45 3150 5193

Email

afroundeh@uma.ac.ir

Person responsible for scientific inquiries

Contact

Name of organization / entity
University of Mohaghegh Ardabili
Full name of responsible person
Roghayyeh Afroundeh
Position
Associate professor
Latest degree
Ph.D.
Other areas of specialty/work
Sport physiology
Street address
Ardabil, University Street, University of Mohaghegh
Ardabili
City
Ardabil
Province
Ardabil
Postal code
5619911367
Phone
+98 45 3150 5626
Email
afroundeh@uma.ac.ir

Person responsible for updating data

Contact

Name of organization / entity
University of Mohaghegh Ardabili
Full name of responsible person
Mohammad Ebrahim Bahram
Position
PhD student in sports physiology
Latest degree
Master
Other areas of specialty/work
Sport physiology
Street address
Ardabil, University Street, University of Mohaghegh
Ardabili
City
Ardabil
Province

Ardabil

Postal code

5619911367

Phone

+98 45 3150 5626

Email

bahramsport2010@gmail.com

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

Not applicable

Data Dictionary

Not applicable

Title and more details about the data/document

The personal data of the study participants can be shared after de-identification

When the data will become available and for how long

Three months after the results are published

To whom data/document is available

researchers

Under which criteria data/document could be used

In order to be more transparent and under the consent of the researcher

From where data/document is obtainable

Mohammad Ebrahim Bahram

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

Request and send to the researcher

Comments