Clinical Trial Protocol
Iranian Registry of Clinical Trials

02 Nov 2026

Comparison the Effects of Aerobic and Resistance Exercise on Arterial Stiffness and Inflammatory Biomarkers in Obese Sedentary Women

Protocol summary

Study aim
The effect of two methods of aerobic and resistance training on arterial stiffness and inflammatory biomarkers was compared .

Design
Two groups of aerobic and resistance training without a control group ,Randomized

Settings and conduct
In this study, both groups completed exercises under the supervision of a coach and the researcher at 22 Bahman Sports hall of Ferdowsi University of Mashhad.The aerobic exercise included riding a spin bike for 35 to 50 minute per session. Resistance training encompassed progressive upper and lower body workouts using six sports devices.

Participants/Inclusion and exclusion criteria
27 to 42 years old, Women, Obese, Healthy

Intervention groups
This research was performed on 27 sedentary obese females.The subjects were randomly assigned into two groups of aerobic (n=14) and resistance training (n=13). The first group was subjected to 8 weeks of aerobic exercise in form of riding a stationary bike at an intensity of 50-70% of the maximum heart-rate reserve. In the second group, the participants performed resistance training for 8 weeks with 60-85% intensity of one repetition maximum (three sessions a week).

Main outcome variables
Arterial Stiffness; Interleukine-6; Interleukine-10; Vo2max.

General information

Reason for update

Acronym

IRCT registration information
IRCT registration number: **IRCT20190308042965N1**
Registration date: **2019-07-14, 1398/04/23**
Registration timing: **retrospective**
Last update: **2019-07-14, 1398/04/23**
Update count: **0**

Registration date
2019-07-14, 1398/04/23

Registrant information

Name
Ziba Rahimian Mashhad

Name of organization / entity
Ferdowsi University of Mashhad

Country
Iran (Islamic Republic of)

Phone
+98 51 3870 3338

Email address
zi.rahimianmashhad@mail.um.ac.ir

Recruitment status
Recruitment complete

Funding source

Expected recruitment start date
2018-04-03, 1397/01/14

Expected recruitment end date
2018-05-22, 1397/03/01

Actual recruitment start date
2018-04-04, 1397/01/15

Actual recruitment end date
2018-06-23, 1397/04/02

Trial completion date
2018-09-22, 1397/06/31

Scientific title
Comparison the Effects of Aerobic and Resistance Exercise on Arterial Stiffness and Inflammatory Biomarkers in Obese Sedentary Women

Public title
Exercise and Arterial Stiffness

Purpose
Prevention

Inclusion/Exclusion criteria

Inclusion criteria:
26-42 years old Obese Woman Healthy Sedentary
Exclusion criteria:
Coronary artery disease Diabetes Renal failure Hepatic failure Thyroid problems Consumption of any specific medicines Smoking habit History of regular exercise in the past six months

Age
From **26 years** old to **42 years** old
Gender
Female

Phase
N/A
Groups that have been masked
No information
Sample size
Target sample size: **28**
Actual sample size reached: **27**
Randomization (investigator's opinion)
Randomized
Randomization description
Based on the number of samples, some cards were prepared and half of them were labeled as aerobic and the other half as resistance training and all the cards were placed in a container. Then, each participant was asked to pull out a card and based on he label, participant was placed one of the groups.
Blinding (investigator's opinion)
Not blinded
Blinding description
Placebo
Not used
Assignment
Parallel
Other design features

Secondary Ids

empty

Ethics committees

1

Ethics committee
Name of ethics committee
Ethics Committee in Ferdowsi University of Mashhad
Street address
Room 414- Third Floor - Central Organization - Ferdowsi University of Mashhad - Azadi Square, Mashhad, Iran
City
Mashhad
Province
Razavi Khorasan
Postal code
9177948974
Approval date
2018-01-28, 1396/11/08
Ethics committee reference number
IR.MUM.FUM.REC.1396.15

Health conditions studied

1

Description of health condition studied
Healthy and inactive obese women
ICD-10 code
E66.09
ICD-10 code description
Other obesity due to excess calories

Primary outcomes

1

Description
Arterial Stiffness
Timepoint
Before the intervention, the middle and end of the protocol
Method of measurement
Digital Barometric Pressure sensor

2

Description
Interleukine-6
Timepoint
Before the intervention, the middle and end of the protocol
Method of measurement
Blood biochemical test

3

Description
Interleukine-10
Timepoint
Before the intervention, the middle and end of the protocol
Method of measurement
Blood biochemical test

4

Description
Vo2max
Timepoint
Before the intervention, the middle and end of the protocol
Method of measurement
Bruce protocol

Secondary outcomes

empty

Intervention groups

1

Description

Intervention group: The aerobic exercise included riding a spin bike for 35-50 min per session at an intensity of 50-70% of the maximum heart rate. The workout consisted of three sections: warm-up including static and dynamic stretching (5 min), riding the spin bike (25-40 min), and cool-down (5 min) as stretching moves. The exercise program was performed for 35 min with at an intensity of 50-60% of the maximum heart rate reserve throughout the first and second weeks, followed by 40 min with the intensity of 50-60% during the third and fourth weeks. On the fifth and sixth weeks, the individuals performed the exercise for 45 min at an intensity of 60-70% of the maximum heart rate reserve. Afterward, they completed 50 min of exercise at an intensity of 60-70% during the seventh and eighth weeks. The exercise intensity was controlled by the Polar wrist heart rate monitor throughout the exercise.

Category

Prevention

2

Description

Intervention group: The plan for resistance training was designed similar to that of DeVallance et al. (2016). Resistance training encompassed progressive upper and lower body workouts using six sports devices. Warm-up and cool-down were performed in the beginning and at the end of the exercise for 5 min by stretching. In the first session, the subjects were familiarized with the devices and the one repetition maximum (1RM) was measured for the exercises related to the upper and lower extremities. In each session, the upper-body exercises required the use of special devices, including vertical chest press, triceps extension, and biceps curl. In addition, leg curl, leg extension, as well as multi hip exercise were applied for lower-body workouts. The intensity of resistance training increased progressively every 2 weeks as follows: the first and second weeks with 60% of 1RM, the third and fourth weeks with 70% of 1RM, the fifth and sixth weeks with 80% of 1RM, followed by the seventh and eighth weeks with 85% 1RM. The participants were encouraged to complete 8-12 repetitions until they were able to perform the exercises properly on their own. In addition, 30-second and 1-min rests were considered between the sets and devices, respectively. .

Category

Prevention

Recruitment centers

1

Recruitment center

Name of recruitment center

Ferdowsi University of Mashhad

Full name of responsible person

Ziba Rahimian Mahhad

Street address

Paradise Daneshgah, Azadi Square, Ferdowsi University of Mashhad,Mashhad

City

Mashhad

Province

Razavi Khorasan

Postal code

9177948974

Phone

+98 51 3880 3529

Email

zi.rahimianmashhad@mail.um.ac.ir

Sponsors / Funding sources

1

Sponsor

Name of organization / entity

Ferdowsi University of Mashhad

Full name of responsible person

Vahid Onvani

Street address

Paradise Daneshgah, Azadi Square, Ferdowsi University of Mashhad

City

Mashhad

Province

Razavi Khorasan

Postal code

9177948974

Phone

+98 51 3880 3477

Email

zi.rahimianmashhad@mail.um.ac.ir

Grant name

Grant code / Reference number

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

Yes

Title of funding source

Ferdowsi University of Mashhad

Proportion provided by this source

10

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

Ferdowsi University of Mashhad

Full name of responsible person

Ziba Rahimian Mashhad

Position

Ph.D Candidate

Latest degree

Master

Other areas of specialty/work
Physiology

Street address
Paradise Daneshgah, Azadi Square, Ferdowsi University of Mashhad, Mashhad

City
Mashhad

Province
Razavi Khorasan

Postal code
9177948974

Phone
+98 51 3870 3338

Email
zi.rahimianmashhad@mail.um.ac.ir

Person responsible for scientific inquiries

Contact

Name of organization / entity
Ferdowsi University of Mashhad

Full name of responsible person
Ziba Rahimian Mashhad

Position
Ph.D Candidate

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Other areas of specialty/work
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Street address
Paradise Daneshgah, Azadi Square, Ferdowsi University of Mashhad,Mashhad

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Province
Razavi Khorasan

Postal code
9177948974

Phone
+98 51 3870 3338

Email
zi.rahimianmashhad@mail.um.ac.ir

Person responsible for updating data

Contact

Name of organization / entity
Ferdowsi University of Mashhad

Full name of responsible person
Ziba Rahimian Mashhad

Position
Ph.D Candidate

Latest degree
Master

Other areas of specialty/work
Physiology

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Paradise Daneshgah, Azadi Square, Ferdowsi University of Mashhad, Mashhad

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Province
Razavi Khorasan

Postal code
9177948974

Phone
+98 51 3870 3338

Email
zi.rahimianmashhad@mail.um.ac.ir

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
No more 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
Undecided - It is not yet known if there will be a plan to make this available

Analytic Code
Not applicable

Data Dictionary
Not applicable