Clinical Trial Protocol
Iranian Registry of Clinical Trials

22 Nov 2026

Hemodynamic response to low load to concentric failure resistance exercise and high load resistance exercise in coronary artery disease patients

Protocol summary

Study aim

The purpose of this research is to investigate the effect of resistance exercise with low load to concentric failure and resistance exercise with high load on hemodynamic response in coronary artery patients.

Design

The design of the current research is a randomized, crossover clinical trial

Settings and conduct

Patients referred to Noor Heart Heart Center in Rasht, perform initial measurements during one session and two types of resistance exercises with two different intensities and repetitions during two sessions.

Participants/Inclusion and exclusion criteria

Age range 50-70 years Patients with a history of angioplasty Occlusion of one to three coronary vessels Patients with a history of rehabilitation exercises Relative cardiorespiratory fitness (METs more than 5 and oxygen consumption equivalent to 18 ml/kg/minute) no significant change in the ejection fraction No cardiac arrhythmia No musculoskeletal injury

Intervention groups

Low load resistance exercise group (40% of one repetition maximum to concentric failure) High load resistance exercise group (70% of one repetition maximum, 10 repetitions)

Main outcome variables

Hemodynamic variables including rate pressure product, systolic and diastolic blood pressure, heart rate and Perceived exertion in response to these two types of resistance exercises to determine the safety of exercises to failure (low load, high repetition) compared to the traditional form of exercises (high load and low repetition)) are measured.

General information

Reason for update

Acronym

IRCT registration information

IRCT registration number: **IRCT20180205038626N14**
Registration date: **2024-03-02, 1402/12/12**
Registration timing: **prospective**

Last update: **2024-03-02, 1402/12/12**
Update count: **0**

Registration date

2024-03-02, 1402/12/12

Registrant information

Name

Zahra Ahmadnia

Name of organization / entity

Country

Iran (Islamic Republic of)

Phone

+98 13 3361 8177

Email address

zahmadnia@gums.ac.ir

Recruitment status

Recruitment complete

Funding source

Expected recruitment start date

2024-03-09, 1402/12/19

Expected recruitment end date

2024-04-19, 1403/01/31

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title
Hemodynamic response to low load to concentric failure resistance exercise and high load resistance exercise in coronary artery disease patients

Public title
Hemodynamic response to low load to failure resistance exercise and high load in coronary artery disease patients

Purpose
Health service research

Inclusion/Exclusion criteria

Inclusion criteria:
Patients with coronary artery disease Patients with a history of angioplasty and occlusion between one and three coronary arteries Relative cardiorespiratory fitness (METs more than 5 and oxygen consumption equivalent to 18 ml/kg/minute) No significant change in the ejection fraction variable according to the opinion of a specialist doctor Not having cardiac arrhythmia with the opinion of a specialist doctor No musculoskeletal injury or arthritis Not having diabetes

Exclusion criteria:
Patients who do not have a history of resistance training (untrained) Patients who have not reached relative compatibility in cardio-respiratory factors Diabetic patients Patients with arrhythmia and patients who have not reached stable conditions in terms of hemodynamics

Age
From **50 years** old to **70 years** old

Gender
Both

Phase
2

Groups that have been masked
No information

Sample size
Target sample size: **18**

Randomization (investigator's opinion)
N/A

Randomization description

Blinding (investigator's opinion)
Not blinded

Blinding description

Placebo
Not used

Assignment
Crossover

Other design features

Secondary Ids

empty

Ethics committees

1

Ethics committee

Name of ethics committee
Research ethnic committees of university of guilan

Street address
5th Kilometer of Persian Gulf Highway, Rasht, Guilan Province, Iran

City
Rasht

Province
Guilan

Postal code
۴۱۹۹۶۱۳۷۷۶

Approval date
2023-11-08, 1402/08/17

Ethics committee reference number
IR.GUILAN.REC.1402.054

Health conditions studied

1

Description of health condition studied
Coronary artery disease

ICD-10 code
I25.1

ICD-10 code description
Atherosclerotic heart disease of native coronary artery

Primary outcomes

1

Description
Rate pressure product

Timepoint
At the beginning of the study or at rest, immediately after doing the exercise, 3 minutes after doing the exercise

Method of measurement
The Rate pressure product is determined by systolic blood pressure and heart rate. An analog sphygmomanometer is used to measure systolic blood pressure and a portable ECG device is used to measure heart rate.

Secondary outcomes

1

Description
Systolic blood pressure

Timepoint
At rest, immediately after exercise and 3 minutes after exercise

Method of measurement
Using an analog pressure gauge

2

Description
Diastolic blood pressure

Timepoint
At rest, immediately after exercise and 3 minutes after exercise

Method of measurement
Using an analog pressure gauge

3

Description
Heart rate
Timepoint
At rest, immediately after exercise and 3 minutes after exercise
Method of measurement
Using a portable ECG device

4

Description
Perceived Exertion
Timepoint
immediately after exercise
Method of measurement
Borg Rating of Perceived Exertion Scale (1-10)

Intervention groups

1

Description
Intervention group: Low-load to concentric failure resistance exercise
Category
Rehabilitation

2

Description
Intervention group: high-load resistance exercise
Category
Rehabilitation

Recruitment centers

1

Recruitment center
Name of recruitment center
The Noor heart center
Full name of responsible person
Dr. payam saidie
Street address
Moalem St, Noor specialist heart clinic
City
Rasht
Province
Guilan
Postal code
۴۱۵۳۸۹۳۸۴۸
Phone
+98 13 9100 4044
Email
info@noor-hc.com
Web page address
https://noor-hc.ir/

Sponsors / Funding sources

1

Sponsor
Name of organization / entity
The university of guilan
Full name of responsible person
Dr. Payam saidie
Street address
5th Kilometer of Persian Gulf Highway, Rasht, Guilan Province, Iran
City
Rasht
Province
Guilan
Postal code
۴۱۹۹۶۱۳۷۷۶
Phone
+98 13 3369 0274
Email
int@guilan.ac.ir
Grant name
Grant code / Reference number
Is the source of funding the same sponsor organization/entity?
Yes
Title of funding source
The university of guilan
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
university of guilan
Full name of responsible person
Adel ghorbani
Position
Master's student in Applied exercise Physiology
Latest degree
Master
Other areas of specialty/work
Others
Street address
5th Kilometer of Persian Gulf Highway, Rasht, Guilan Province, Iran
City
Rasht
Province
Guilan
Postal code

4199613776

Phone

01333690274-8

Email

adel.ghorbani.pe@gmail.com

Person responsible for scientific inquiries

Contact

Name of organization / entity

The university of guilan

Full name of responsible person

Payam Saidie

Position

Assistant Professor of the Department of Sports Physiology, Faculty of Sports Sciences, Gilan Univer

Latest degree

Ph.D.

Other areas of specialty/work

Exercise physiology

Street address

رشت، بزرگراه خلیج فارس، کیلومتر ۵ جاده تهران، مجتمع دانشگاه گیلان

City

Rasht

Province

Guilan

Postal code

۴۱۹۹۶۱۳۷۷۶

Phone

+98 13 3369 0274

Email

payam.saidie@gmail.com

Person responsible for updating data

Contact

Name of organization / entity

Rasht University of Medical Sciences

Full name of responsible person

Zahra Ahmadnia

Position

Rasht

Latest degree

Master

Other areas of specialty/work

پرستاری

Street address

Dr. Heshmat Hospital, Bayani St; Mosala Square, Rasht

City

Rasht

Province

Guilan

Postal code

4193955588

Phone

+98 13 3366 9064

Email

zahmadnia1365@gmail.com

Sharing plan

Deidentified Individual Participant Data Set (IPD)

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

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

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

Data Dictionary

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