

Clinical Trial Protocol

Iranian Registry of Clinical Trials

11 Sep 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)

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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

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Moalem St, Noor specialist heart clinic

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Sponsors / Funding sources

1

Sponsor

Name of organization / entity

The university of guilan

Full name of responsible person

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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

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Person responsible for scientific inquiries

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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

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Person responsible for updating data

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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