

Clinical Trial Protocol

Iranian Registry of Clinical Trials

29 Jun 2026

Comparison of high-intensity interval training and moderate-intensity continuous training models on cardiac rehabilitation indices and electrical activity after coronary artery bypass surgery

Protocol summary

alternans in electrocardiogram; VO2PEAK

Study aim

Comparison of high-intensity and moderate-intensity continuous training models on rehabilitation of cardiac patients after coronary artery bypass surgery

Design

clinical trial with control group , with parallel group, single-blind, randomized with computer and on 18 patients

Settings and conduct

This study is performed in the heart clinics of Shiraz in Iran by selecting the three groups that mentioned. After selection, patients will be examined by electrocardiography and cardiac stress test and will be engaged in exercises for 6 weeks, and then electrocardiography and exercise test will be repeated. .

Participants/Inclusion and exclusion criteria

Male and female gender, sinus rhythm, left ventricular ejection fraction 50% or higher, and 4 to 16 weeks after CABG

Intervention groups

The study will consist of three groups, two groups under the intervention of exercise program under two protocols: MICE protocol, (Moderate intensity continuous training) Includes 3 sessions of 45-minute workouts with an intensity of 70% of the heart rate reserve in each week. it s done for 6 weeks. At the beginning and end of each training session, the patient will warm up and cool down HIIT protocol (high intensity interval training) Warm up 9 time repetition of 2-minute training with an intensity of 90-85% of the heart rate reserve and with an active rest period of 2 minutes between them with Intensity of 70-60% of stored heart rate cool down Control group They will be selected from those who do not do a cardiac rehabilitation exercise program

Main outcome variables

Main out come variables consists: Heart rate variability (HRV); QT interval in electrocardiogram; T wave

General information

Reason for update

Acronym

IRCT registration information

IRCT registration number: **IRCT20220326054352N1**

Registration date: **2022-03-31, 1401/01/11**

Registration timing: **prospective**

Last update: **2022-03-31, 1401/01/11**

Update count: **0**

Registration date

2022-03-31, 1401/01/11

Registrant information

Name

Emad Jowharishirazi

Name of organization / entity

Country

Iran (Islamic Republic of)

Phone

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Email address

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Recruitment status

Recruitment complete

Funding source

Expected recruitment start date

2022-05-22, 1401/03/01

Expected recruitment end date

2022-06-22, 1401/04/01

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

Comparison of high-intensity interval training and moderate-intensity continuous training models on cardiac rehabilitation indices and electrical activity after coronary artery bypass surgery

Public title

Comparison of high and moderate intensity cardiac rehabilitation after CABG

Purpose

Supportive

Inclusion/Exclusion criteria**Inclusion criteria:**

Male and female gender, sinus rhythm, EF 50% or higher and 4 to 16 weeks after CABG

Exclusion criteria:

Includes peripheral vascular disease, valvular disease, PVC PAC RYTHM, conduction defects diabetes, 160/90 mm Hg, limited neurological features And orthopedics related to exercise, discontinuation of medication during the study

Age

From **35 years** old to **60 years** old

Gender

Both

Phase

N/A

Groups that have been masked

- Data analyser

Sample size

Target sample size: **18**

Randomization (investigator's opinion)

Randomized

Randomization description

The randomization method will be such that the study population is from one of the most busiest heart clinics in Shiraz and patients should refer to it after surgery. then the subjects will be divided into 4 groups, based on women between 35 and 50, men between 35 and 50, men between 50 and 60, and women between 50 and 60. Then, 4 people will be selected by simple classified sampling for each group . then, one person will be selected from that four participant for each of the sports protocol groups randomly and through a lottery by unknown balls. Two people will also join the control group. Obviously, the randomization unit is individual. Classified randomization will be done after determining the groups by Excel software. the results of the lottery, which will be based on the protocol and control groups and the personnel code, will be given to the participants in an sealed envelope.

Blinding (investigator's opinion)

Single blinded

Blinding description

data analyser will be blind with coding the data

Placebo

Not used

Assignment

Parallel

Other design features**Secondary Ids**

empty

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

Ethics committee of Shiraz University of Medical Sciences

Street address

No32, 49/4Ave, Ghasroddasht street

City

Shiraz

Province

Fars

Postal code

7183783384

Approval date

2019-07-03, 1398/04/12

Ethics committee reference number

IR.SUMS.MED.REC.1398.246

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

Coronary artery disease, coronary artery stenosis, cardiac rehabilitation, CABG, post CABG complication

ICD-10 code

I25.1

ICD-10 code description

Atherosclerotic heart disease of native coronary artery

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

Vo2peak(maximum oxygen uptake)

Timepoint

before and after intervention

Method of measurement

indirectly by cardiac stress test

2**Description**

Heart rate variability

Timepoint

before and after intervention

Method of measurement

Electrocardiography

3

Description

QT interval

Timepoint

before and after intervention

Method of measurement

Electrocardiography

4

Description

T wave alternans

Timepoint

before and after intervention

Method of measurement

Electrocardiography

Secondary outcomes

empty

Intervention groups

1

Description

Intervention group:1:"MICE protocol, (Moderate intensity continuous training) Includes 3 sessions of 45-minute workouts with an intensity of 70% of the heart rate reserve in each week .it s done for 6 weeks. At the beginning and end of each training session, the patient will warm up and cool down for 5 minutes with an intensity of 50-55% of The heart rate reserve

Category

Rehabilitation

2

Description

Intervention group: 2:" HIIT protocol (high intensity interval training)Warm up for 5 minutes with an intensity of 60-50% of heart rate reserve2 9 time repetition of 2-minute training with an intensity of 90-85% of the heart rate reserve and with an active rest period of 2 minutes between them with Intensity of 70-60% of stored heart rate5 minutes with an intensity of 60-50% of the heart rate reserve for cooling down

Category

Rehabilitation

3

Description

Control group: No intervention

Category

N/A

Recruitment centers

1

Recruitment center**Name of recruitment center**

Imam Reza clinic

Full name of responsible person

Emad Jowhari Shirazi

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Sponsors / Funding sources

1

Sponsor**Name of organization / entity**

Shiraz University of Medical Sciences

Full name of responsible person

DR.Mahtab Meamarpoor

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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

Shiraz University of Medical Sciences

Proportion provided by this source

50

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**

Shiraz University of Medical Sciences

Full name of responsible person

Emad Jowharishirazi

Position

Intern

Latest degree

A Level or less

Other areas of specialty/work

Cardiology

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Person responsible for updating data**Contact****Name of organization / entity**

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Full name of responsible person

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Position

cardiology professor

Latest degree

Subspecialist

Other areas of specialty/work

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Latest degree

Subspecialist

Other areas of specialty/work

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Fax**Email****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

There is no further information

Study Protocol

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

Statistical Analysis Plan

No - There is not a plan to make this available

Informed Consent Form

No - There is not a plan to make this available

Clinical Study Report

No - There is not a plan to make this available

Analytic Code

No - There is not a plan to make this available

Data Dictionary

No - There is not a plan to make this available