Clinical Trial Protocol
Iranian Registry of Clinical Trials

10 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

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 alternans in electrocardiogram; VO2PEAK

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)

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+98 71 3627 6693

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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 featuresAnd 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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Namazi square
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7134814734
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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
Street address
Shiraz medical university, Zand university
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Postal code
7134814336
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vcrdep@sums.ac.ir
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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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