

Clinical Trial Protocol

Iranian Registry of Clinical Trials

09 Jul 2026

Comparisons of two high intensity interval training protocols on markers of blood fluidity in hypertensive patients

Protocol summary

Study aim

To investigate the effects of two high intensity interval training on blood rheological variables in hypertensive patients

Design

parallel group randomized clinical trial

Settings and conduct

This study was carried out at Shahid Rajaei Hospital. Thirty hypertensive (stage 1, systolic BP >140 and diastolic BP >90 mmHg) patients (age, 47.96 ± 3.20 yrs), were randomly allocated to short duration HIIT (SDHIIT, n=10), long duration HIIT (LDHIIT, n=10), and control (n=10) groups. After two weeks of continuous mild training, patients in SDHIIT group performed 8 weeks of HIIT included 27 min HIIT that encompassed 27 repetitions of 30s activity at 80%-100% of VO₂peak interspersed by 30s passive/active (10%-20% of VO₂peak) recovery, while, patients in LDHIIT group performed 8 weeks of HIIT (32min per session) included 4 repetitions of 4min activity at 75%-90% of VO₂peak interspersed by 4min passive/active (15%-30% of VO₂peak) recovery. Two blood samples were taken before and after training and were analyzed for hemorheological variables.

Participants/Inclusion and exclusion criteria

Prehypertension Blood pressure 130-150 mmHg

Intervention groups

1) Control, 2) Short duration high intensity interval training (30s/30s), and 3) Long duration high intensity interval training (4min/4min).

Main outcome variables

HIIT training reduced the blood and plasma viscosity, and RBC aggregation and increased RBC deformability

General information

Reason for update

Acronym

HIIT

IRCT registration information

IRCT registration number: **IRCT20160606028290N1**

Registration date: **2018-11-05, 1397/08/14**

Registration timing: **retrospective**

Last update: **2018-11-05, 1397/08/14**

Update count: **0**

Registration date

2018-11-05, 1397/08/14

Registrant information

Name

Sajad Ahmadizad

Name of organization / entity

Shahid Beheshti University

Country

Iran (Islamic Republic of)

Phone

+98 21 2990 2931

Email address

s_ahmadizad@sbu.ac.ir

Recruitment status

Recruitment complete

Funding source

Expected recruitment start date

2017-04-01, 1396/01/12

Expected recruitment end date

2017-06-01, 1396/03/11

Actual recruitment start date

2017-04-01, 1396/01/12

Actual recruitment end date

2017-06-01, 1396/03/11

Trial completion date

2018-02-20, 1396/12/01

Scientific title

Comparisons of two high intensity interval training protocols on markers of blood fluidity in hypertensive patients

Public title

High intensity interval training and markers of blood fluidity in hypertensive patients

Purpose

Prevention

Inclusion/Exclusion criteria**Inclusion criteria:**

prehypertension Blood pressure 130-150 mmHg Age range between 40-60 years

Exclusion criteria:

Having a regular exercise training

Age

From **40 years** old to **60 years** old

Gender

Male

Phase

3

Groups that have been masked

No information

Sample size

Target sample size: **30**

More than 1 sample in each individual

Number of samples in each individual: **2**

Pre and post training samples

Actual sample size reached: **30**

Randomization (investigator's opinion)

Randomized

Randomization description

Patients referred to Shahid Rajayee Hospital who had the inclusion criteria were initially chosen and after the telephone contact and explanation of research agreed to participate. After measuring the blood pressure all subjects were ordered from highest to lowest blood pressure were ordered and were allocated to the blocks of 3 (10 blocks). Thereafter, the 3 subjects in each block were randomly allocated to three groups (control, and 2 training groups), so that at the end there were 10 subjects in each group and the subjects with higher blood pressure were divided in 3 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**

Shahid Rajaie cardiovascular center

Street address

Cross section for Vali-asr st & Hashemi Rafsanjani Hwy,

City

Tehran

Province

Tehran

Postal code

19969 11151

Approval date

2017-01-21, 1395/11/02

Ethics committee reference number

RHC.AC.IR.REC.1395.14

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

Pre-hypertension and hemorheological variables

ICD-10 code

I10

ICD-10 code description

Essential (primary) hypertension

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

Blood and plasma viscosity

Timepoint

Before training and 48 hours after the last training session

Method of measurement

EDTA Blood and using cone plate viscometer

2**Description**

RBC Aggregation

Timepoint

Before training and 48 hours after the last training session

Method of measurement

EDTA Blood and using Rheometer aggregometer

3**Description**

RBC deformability

Timepoint

Before training and 48 hours after the last training session

Method of measurement

EDTA Blood and using Rheometer aggregometer

Secondary outcomes

empty

Intervention groups

1

Description

Control group: No intervention received, only two blood samples were taken before and after training and were analyzed for hemorheological variables.

Category

N/A

2

Description

Intervention group: Short duration HIIT training After two weeks of continuous mild training, patients in SDHIIT group performed 8 weeks of HIIT included 27 min HIIT that encompassed 27 repetitions of 30s activity at 80%-100% of VO₂peak interspersed by 30s passive/active (10%-20% of VO₂peak) recovery. Two blood samples were taken before and after training and were analyzed for hemorheological variables.

Category

Treatment - Other

3

Description

Intervention group: Long duration HIIT training Patients in LDHIIT group performed 8 weeks of HIIT (32min per session) included 4 repetitions of 4min activity at 75%-90% of VO₂peak interspersed by 4min passive/active (15%-30% of VO₂peak) recovery. Two blood samples were taken before and after training and were analyzed for hemorheological variables.

Category

Treatment - Other

Recruitment centers

1

Recruitment center

Name of recruitment center

Rajaie Heart Hospital

Full name of responsible person

Neda Aghaei

Street address

Cross-section for Vali-asr St & Hashemi Rafsanjani Hwy,

City

Tehran

Province

Tehran

Postal code

19969 11151

Phone

+98 21 2990 2931

Email

nedaghaei@gmail.com

Sponsors / Funding sources

1

Sponsor

Name of organization / entity

Shahid Beheshti Uni

Full name of responsible person

Dr. Babak Shokri

Street address

University square, Velenjak

City

Tehran

Province

Tehran

Postal code

1983963113

Phone

+98 21 2290 2236

Email

b-shokri@sbu.ac.ir

Grant name

N/A

Grant code / Reference number

N/A

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

Yes

Title of funding source

Shahid Beheshti Uni

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

Shahid Beheshti Uni

Full name of responsible person

Sajad Ahmadizad

Position

Associate professor

Latest degree

Ph.D.

Other areas of specialty/work

Sport Physiology

Street address

University square, Velenjak

City

Tehran

Province

Tehran

Postal code

1983963113

Phone

+98 21 2990 2931

Email
s_ahmadizad@sbu.ac.ir

Person responsible for scientific inquiries

Contact

Name of organization / entity
Shahid Beheshti University
Full name of responsible person
Sajad Ahmadizad
Position
Associate professor
Latest degree
Ph.D.
Other areas of specialty/work
Sport Physiology
Street address
University square, Velenjak
City
Tehran
Province
Tehran
Postal code
1983963113
Phone
+98 21 2990 2931
Fax
+98 21 2243 1953
Email
s_ahmadizad@sbu.ac.ir

Person responsible for updating data

Contact

Name of organization / entity
Shahid Beheshti University
Full name of responsible person
Sajad Ahmadizad
Position
Associate professor
Latest degree
Ph.D.
Other areas of specialty/work
Sport Physiology

Street address
University square, Velenjak
City
Tehran
Province
Tehran
Postal code
1983963113
Phone
+98 21 2990 2931
Fax
+98 21 2243 1953
Email
s_ahmadizad@sbu.ac.ir

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
Yes - There is a plan to make this available
Statistical Analysis Plan
Not applicable
Informed Consent Form
No - There is not a plan to make this available
Clinical Study Report
Not applicable
Analytic Code
Not applicable
Data Dictionary
Not applicable
Title and more details about the data/document
N/A
When the data will become available and for how long
N/A
To whom data/document is available
N/A
Under which criteria data/document could be used
N/A
From where data/document is obtainable
N/A
What processes are involved for a request to access data/document
N/A
Comments