

# 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,  $47.96 \pm 3.20$  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 VO<sub>2</sub>peak interspersed by 30s passive/active (10%-20% of VO<sub>2</sub>peak) recovery, while, patients in LDHIIT group performed 8 weeks of HIIT (32min per session) included 4 repetitions of 4min activity at 75%-90% of VO<sub>2</sub>peak interspersed by 4min passive/active (15%-30% of VO<sub>2</sub>peak) 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 VO<sub>2</sub>peak interspersed by 30s passive/active (10%-20% of VO<sub>2</sub>peak) 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 VO<sub>2</sub>peak interspersed by 4min passive/active (15%-30% of VO<sub>2</sub>peak) 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

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##### 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

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Shahid Beheshti University

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**Email**

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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**

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**