

# Clinical Trial Protocol

## Iranian Registry of Clinical Trials

09 Jun 2026

### Study of the effect of saffron aqueous extract and its carotenoids (crocin and crocetin) on plasma proteome pattern, expression of LOX1 gene and miRNA223, and serum homocystein levels in atherosclerotic patients.

#### Protocol summary

##### Study aim

Investigation of the effects of saffron aqua-extraction and its carotenoids (crocin and crocetin) on the fasting blood glucose (FBG), lipid profile, and serum concentration of homocysteine, MCP-1, ICAM-1, VCAM-1, and h-FABP and genes expressions of SIRT1, LOX-1, MCP-1, AMPK, NFκB, and miR-223 and anthropometric indices, quality of life assessment, left ventricular ejection fraction and the plasma proteomic pattern in atherosclerotic patients in comparison with together and control group.

##### Design

A double-blinded parallel randomized clinical trial with 89 patients and at phase 2

##### Settings and conduct

This study is done in the Shahid Madani Cardiovascular Center of Tabriz. Biochemical and Proteomics tests will be carried out at Tarbiat Modarres University. Before and after interventions, blood samples will be collected. A part of the plasma will be dealbuminated and be applied for two-dimensional gel electrophoresis. Then, the plasma proteome patterns of the patients before and after intervention will be compared using a software. ELISA, Colorimetry, and Real-Time PCR will be used for Measuring of serum concentration of homocysteine and proteins, lipid profile and FBG, and genes expressions, respectively. Finally, all data will be analyzed via suitable statistical analysis methods.

##### Participants/Inclusion and exclusion criteria

Inclusion criteria: Overweight/obese CAD patients of both gender (45-60 year old, BMI: 25-35 Kg/m<sup>2</sup>) Exclusion criteria: Cardiac events, Gestation, Menopause

##### Intervention groups

89 patients in 4 groups will randomly receive one capsule containing saffron aqua extract (30 mg; N: 20) or crocin (30 mg; N: 24) or crocetin (10 mg, N: 24) or placebo (N: 21), once a day, for 60 days.

##### Main outcome variables

FBG lipid profile Plasma concentrations of Hcy, MCP-1, ICAM-1, VCAM-1, h-FABP Genes expressions of SIRT1, LOX-1, MCP-1, AMPK, NFκB, miR-223 LVEF Proteomic pattern

#### General information

##### Reason for update

##### Acronym

##### IRCT registration information

IRCT registration number: **IRCT20161102030649N1**  
Registration date: **2018-01-26, 1396/11/06**  
Registration timing: **registered\_while\_recruiting**

Last update: **2019-02-17, 1397/11/28**

Update count: **2**

##### Registration date

2018-01-26, 1396/11/06

##### Registrant information

##### Name

Saeed Abedimanesh

##### Name of organization / entity

Tarbiat Modares University

##### Country

Iran (Islamic Republic of)

##### Phone

+98 21 8288 0000

##### Email address

s.abedymaresh@modares.ac.ir

##### Recruitment status

**Recruitment complete**

##### Funding source

##### Expected recruitment start date

2017-09-23, 1396/07/01

##### Expected recruitment end date

2018-03-06, 1396/12/15  
**Actual recruitment start date**  
2017-09-24, 1396/07/02  
**Actual recruitment end date**  
2018-03-15, 1396/12/24  
**Trial completion date**  
2018-03-15, 1396/12/24

#### Scientific title

Study of the effect of saffron aqueous extract and its carotenoids (crocin and crocetin) on plasma proteome pattern, expression of LOX1 gene and miRNA223, and serum homocystein levels in atherosclerotic patients.

#### Public title

Effect of saffron aqua-extract and its carotenoids in atherosclerotic patients.

#### Purpose

Supportive

#### Inclusion/Exclusion criteria

##### Inclusion criteria:

subjects with coronary artery disease 40-65 years old overweight and obese (BMI 25-35 kg/m<sup>2</sup>) subjects without a history of myocardial infarction (MI) No tobacco or alcohol consumption who had no symptoms of cancer, auto-immune, allergy, infection, kidney and liver diseases Not consuming of antioxidants supplement and vitamins for the last six months. Signing up the informed consent form

##### Exclusion criteria:

Cardiac events Gestation or Menopause Recent taking systemic medication (other than the usual drug for hypertension, dyslipidemia, and hyperglycemia)

#### Age

From **40 years** old to **65 years** old

#### Gender

Both

#### Phase

2

#### Groups that have been masked

- Participant
- Care provider
- Investigator
- Outcome assessor
- Data analyser

#### Sample size

Target sample size: **60**

Actual sample size reached: **89**

#### Randomization (investigator's opinion)

Randomized

#### Randomization description

randomization will be done with software.

#### Blinding (investigator's opinion)

Double blinded

#### Blinding description

In this study, patients, investigators who administer drug/placebo to patients, statistical and laboratory analyzer technicians as well as healthcare center personnel, are blind using the coding system before starting intervention. Researchers who involved in the writing of paper and final conclusion would have

permission to access decoded information in order to have the best interpretations and scientific results.

#### Placebo

Used

#### Assignment

Parallel

#### Other design features

## Secondary Ids

empty

## Ethics committees

### 1

#### Ethics committee

##### Name of ethics committee

Ethic committee of Tarbiat Modares University

##### Street address

Tarbiat Modares University, Gisha Bridg, Tehran, Iran.

##### City

Tehran

##### Province

Tehran

##### Postal code

14115-116

#### Approval date

2017-09-23, 1396/07/01

#### Ethics committee reference number

IR.TMU.REC.1396.610

## Health conditions studied

### 1

#### Description of health condition studied

Cardiovascular disease, coronary artery disease (CAD)

#### ICD-10 code

I25.110

#### ICD-10 code description

Atherosclerotic heart disease of native coronary artery with unstable angina pectoris

## Primary outcomes

### 1

#### Description

LOX-1 gene relative expression in PBMCs.

#### Timepoint

Before the intervention (day 0), and 8 weeks after the intervention (day 60)

#### Method of measurement

Real time PCR

### 2

#### Description

miRNA-223 copy number in PBMCs

#### Timepoint

Before the intervention (day 0), and 8 weeks after the

intervention (day 60)

**Method of measurement**

Real time PCR

**3**

**Description**

Plasma Homocystein concentration

**Timepoint**

Before the intervention (day 0), and 8 weeks after the intervention (day 60)

**Method of measurement**

ELISA

**4**

**Description**

Plasma Proteome patern

**Timepoint**

Before the intervention (day 0), and 8 weeks after the intervention (day 60)

**Method of measurement**

2-D Gel Electrophoresis

**5**

**Description**

Serum concentrations of h-FABP

**Timepoint**

Before the intervention (day 0), and 8 weeks after the intervention (day 60)

**Method of measurement**

ELISA

**6**

**Description**

Serum concentrations of MCP-1

**Timepoint**

Before the intervention (day 0), and 8 weeks after the intervention (day 60)

**Method of measurement**

ELISA

**7**

**Description**

Serum concentrations of ICAM-1

**Timepoint**

Before the intervention (day 0), and 8 weeks after the intervention (day 60)

**Method of measurement**

ELISA

**8**

**Description**

Serum concentrations of VCAM-1

**Timepoint**

Before the intervention (day 0), and 8 weeks after the intervention (day 60)

**Method of measurement**

ELISA

**9**

**Description**

fasting blood glucose (FBG)

**Timepoint**

Before the intervention (day 0), and 8 weeks after the intervention (day 60)

**Method of measurement**

colorimetric based kit

**10**

**Description**

Lipid profile

**Timepoint**

Before the intervention (day 0), and 8 weeks after the intervention (day 60)

**Method of measurement**

colorimetric based kit

**11**

**Description**

NFkB gene relative expression in PBMCs.

**Timepoint**

Before the intervention (day 0), and 8 weeks after the intervention (day 60)

**Method of measurement**

Real time PCR

**12**

**Description**

SIRT-1 gene relative expression in PBMCs.

**Timepoint**

Before the intervention (day 0), and 8 weeks after the intervention (day 60)

**Method of measurement**

Real time PCR

**13**

**Description**

MCP-1 gene relative expression in PBMCs.

**Timepoint**

Before the intervention (day 0), and 8 weeks after the intervention (day 60)

**Method of measurement**

Real time PCR

**14**

**Description**

AMPK gene relative expression in PBMCs.

**Timepoint**

Before the intervention (day 0), and 8 weeks after the intervention (day 60)

**Method of measurement**

Real time PCR

**15**

**Description**

left Ventricular Ejection Fraction (LVEF)

### **Timepoint**

Before the intervention (day 0), and 8 weeks after the intervention (day 60)

### **Method of measurement**

Echocardiographic examinations were performed using Vivid 7 Pro (GE, USA) instrument

## **Secondary outcomes**

### **1**

#### **Description**

Body Mass Index (BMI)

#### **Timepoint**

Before the intervention (day 0), and 8 weeks after the intervention (day 60)

#### **Method of measurement**

height and weight measurement and calculate with formula

### **2**

#### **Description**

waist to hip circumference (WHR)

#### **Timepoint**

Before the intervention (day 0), and 8 weeks after the intervention (day 60)

#### **Method of measurement**

spring-loaded tape measure

### **3**

#### **Description**

Quality of life assessment

#### **Timepoint**

Before the intervention (day 0), and 8 weeks after the intervention (day 60)

#### **Method of measurement**

Mac new quality of life questionnaire for ischemic heart patients

## **Intervention groups**

### **1**

#### **Description**

Intervention group: 1. In this group of study, each patient receives one capsule of 30 mg saffron aqua-extract (made by Dr. Bathaie Lab. Tarbiat Modares University, Faculty of clinical biochemistry) for 2 months.

#### **Category**

Treatment - Other

### **2**

#### **Description**

Intervention group: 2. In this group of study, each patient receives one capsule of 30 mg crocin (made by Dr. Bathaie Lab. Tarbiat Modares University, Faculty of clinical biochemistry) for 2 months.

#### **Category**

Treatment - Other

### **3**

#### **Description**

Intervention group: 3. In this group of study, each patient receives one capsule of 10 mg crocetin (made by Dr. Bathaie Lab. Tarbiat Modares University, Faculty of clinical biochemistry) for 2 months.

#### **Category**

Treatment - Other

### **4**

#### **Description**

Control group: 4. In this group of study, each patient receives one placebo capsule (made by Dr. Bathaie's Lab. Tarbiat Modares University, Faculty of clinical biochemistry) for 2 months.

#### **Category**

Placebo

## **Recruitment centers**

### **1**

#### **Recruitment center**

##### **Name of recruitment center**

Shahid Madani Medical research training center, Tabriz university of medical science.

##### **Full name of responsible person**

Dr.Mohammad Reza Tabani.

##### **Street address**

Tabriz University Street

##### **City**

Tabriz

##### **Province**

East Azarbaijan

##### **Postal code**

5166614766

##### **Phone**

+98 41 3337 3900

##### **Fax**

##### **Email**

afsaris@tbzmed.ac.ir

##### **Web page address**

<http://madanihosp.tbzmed.ac.ir/>

## **Sponsors / Funding sources**

### **1**

#### **Sponsor**

##### **Name of organization / entity**

Vice Chancellor for research of Tarbiat Modares University, Faculty of Medical Science.

##### **Full name of responsible person**

Dr. Yaagub Fath Allahi

##### **Street address**

Gisha Bridge, Jalal Al Ahmad Highway, Tehran.

##### **City**

Tehran

##### **Province**

Tehran

**Postal code**

14115-116

**Phone**

+98 21 8288 0000

**Email**

s.abedy88@Gmail.com

**Web page address**

http://modares.ac.ir

**Grant name****Grant code / Reference number****Is the source of funding the same sponsor organization/entity?**

Yes

**Title of funding source**

Vice Chancellor for research of Tarbiat Modares University, Faculty of Medical Science.

**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**

Tarbiat Modares University

**Full name of responsible person**

Saeed Abedimanesh

**Position**

PhD Student

**Latest degree**

Master

**Other areas of specialty/work**

Biochemistry

**Street address**

Gisha Bridge, Jalal Al Ahmad highway, TMU university

**City**

Tehran

**Province**

Tehran

**Postal code**

14115-116

**Phone**

+98 21 8288 0000

**Email**

s.abedymanesh@modares.ac.ir

**Person responsible for scientific inquiries****Contact****Name of organization / entity**

Tarbiat Modares University - Faculty of Medical Science

**Full name of responsible person**

Seyede Zahra Bathaie

**Position**

Full professor

**Latest degree**

Ph.D.

**Other areas of specialty/work**

Biochemistry

**Street address**

Gisha Bridge, Jalal Al Ahmad highway, Tehran.

**City**

Tehran

**Province**

Tehran

**Postal code**

14115-116

**Phone**

+98 21 8288 4567

**Email**

zbatha2000@yahoo.com

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

Tarbiat Modares University

**Full name of responsible person**

Saeed Abedimanesh

**Position**

PhD Student

**Latest degree**

Master

**Other areas of specialty/work**

Biochemistry

**Street address**

Gisha Bridge, Jalal Al Ahmad Highway

**City**

Tehran

**Province**

Tehran

**Postal code**

14115-116

**Phone**

+98 21 8288 0000

**Email**

s.abedymanesh@modares.ac.ir

**Sharing plan****Deidentified Individual Participant Data Set (IPD)**

Yes - There is a plan to make this available

**Study Protocol**

Yes - There is a plan to make this available

**Statistical Analysis Plan**

Yes - There is 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

**Title and more details about the data/document**

only primary outcome measure will be shared after intervention.

**When the data will become available and for how long**

Starting 1 year after publication.

**To whom data/document is available**

Documents/Information will be shared only for people working in academic institutions.

**Under which criteria data/document could be used**

Researchers at the field of cardiovascular disease can achieve our documents and information. but they must named our researchers as the co-authors in their publications.

**From where data/document is obtainable**

Saeed Abedimanesh Tell: 00989141145213 E-mail: s.abedymanesh@modares.ac.ir

**What processes are involved for a request to access data/document**

Applicants must explain their conditions by email, after acceptance they will receive the documents.

**Comments**