

# Clinical Trial Protocol

## Iranian Registry of Clinical Trials

18 Jun 2026

### Comparison of the effect of empagliflozin and pioglitazone and placebo on liver steatosis change in fibroscan in diabetic patients with non-alcoholic fatty liver disease

#### Protocol summary

##### Study aim

The effect of Empagliflozin and pioglitazone and placebo on fibroscan in diabetic patients with non-alcoholic fatty liver disease referred to Firoozgar hospital

##### Design

Randomized controlled clinical trial with parallel groups, triple blind

##### Settings and conduct

Diabetic patients with nonalcoholic fatty liver are referred to Firoozgar hospital will be randomized to three groups (M, Z, Q) and prescribed Empagliflozin and Pioglitazone and placebo in each group with same coverage and researcher and patients and data analyzer will be blind to type of the drug. primary outcome is change in measured steatosis in fibroscan.

##### Participants/Inclusion and exclusion criteria

Inclusion criteria: 20 to 65 years, diabetic with HbA1c 7-10, ALT more than 45 and 30 milligram/deciliter in men and women respectively, one of (fatty liver grade equals and more than 2 in sonography or controlled attenuation parameter in fibroscan more than 230 decibels per meter). Exclusion criteria: alcohol consumption, autoimmune hepatitis, hepatitis B and C, Heart failure, renal failure, consumption of Fibrate, statin, NSAIDs, Amiodarone, Tamoxifen, Zinc, Selenium and vitamin C and E, Empagliflozin, Metformin, Pioglitazone and corticosteroid, cirrhosis, cardiovascular disease, pregnancy, breast feeding, recently cancer, active hypothyroidism, body mass index more than 40 kilogram per square meter, diabetes type 1 or secondary diabetes.

##### Intervention groups

Intervention group 1: intake Empagliflozin 10 milligram once daily - Intervention group 2: pioglitazone 15 milligram once daily - Control group: Placebo once daily

##### Main outcome variables

Primary endpoints: changes in CAP (marker of the liver steatosis in fibroscan) Secondary endpoints: changes in

liver enzymes, lipid profiles, body composition (VAT area and A/G in DXA), LSM (marker of the liver fibrosis in fibroscan), NAFLD fibrosis risk score and FIB-4 index and HbA1c and FBS.

#### General information

##### Reason for update

##### Acronym

##### IRCT registration information

IRCT registration number: **IRCT20190122042450N3**

Registration date: **2019-05-24, 1398/03/03**

Registration timing: **registered\_while\_recruiting**

Last update: **2019-05-24, 1398/03/03**

Update count: **0**

##### Registration date

2019-05-24, 1398/03/03

##### Registrant information

##### Name

Mohammad Ebrahim Khamseh

##### Name of organization / entity

##### Country

Iran (Islamic Republic of)

##### Phone

+98 21 8894 5246

##### Email address

khamseh.m@iums.ac.ir

##### Recruitment status

**Recruitment complete**

##### Funding source

##### Expected recruitment start date

2019-05-21, 1398/02/31

##### Expected recruitment end date

2019-08-22, 1398/05/31

##### Actual recruitment start date

empty  
**Actual recruitment end date**  
empty  
**Trial completion date**  
empty

**Scientific title**  
Comparison of the effect of empagliflozin and pioglitazone and placebo on liver steatosis change in fibroscan in diabetic patients with non-alcoholic fatty liver disease

**Public title**  
The effect of empagliflozin on nonalcoholic fatty liver disease in diabetic patients

**Purpose**  
Treatment

**Inclusion/Exclusion criteria**

**Inclusion criteria:**

Age 20-65 Body mass index less than 40 Alcohol daily consumption less than 20 g in women and less than 30 g in men, for at least 3 consecutive months over 5 years ago Hemoglobin A1c 7-10 percent Alanin aminotransferase more than 45 in men and more than 30 in women Creatinin less than 1.5 in men and less than 1.4 in women and glomerular filtration rate more than 45 Controlled attenuated parameter more than 230 in fibroscan or fatty liver grade equal and more than 2 in liver sonography Signature of consent form

**Exclusion criteria:**

Pregnancy, breast feeding Heart failure (class II to IV) History of cardiovascular disease in 3 months ago History of cancer in 2 years ago History of cirrhosis Abnormal TSH (uncontrolled yper or hypothyroidism) Autoimmune hepatitis (abnormal ANA and ASMA) Hepatitis C (positive HCV Ab) Hepatitis B (positive HBS Ag) Consumption of NSAIDs, Amiodarone, Tamoxifen, Fibrate, statin, Zinc, Selenium and vitamin C or other antioxidant drugs, Empagliflozin, Metformin, Pioglitazone, Vitamin E and other fatty liver drugs. Diabetes type 1 or secondary diabetes Consumption of corticosteroid for 14 days over 2 months ago biliary obstruction in liver and gallbladder sonography

**Age**  
From **20 years** old to **65 years** old

**Gender**  
Both

**Phase**  
2-3

**Groups that have been masked**

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

**Sample size**  
Target sample size: **105**

**Randomization (investigator's opinion)**  
Randomized

**Randomization description**  
Simple randomization method, 6 blocks

**Blinding (investigator's opinion)**

Triple blinded

**Blinding description**

Abidi's pharmacy place the empagliflozine and pioglitazone and placebo in unique package and label as Q, M, Z and distribute between patients by non-notified person while patient and investigator are not informed about type of drugs. Also, health-care and staffs of labroatory and radiology and fibroscan and DEXA are not informed about type of drugs. Also, Outcome evaluator and data analyzer are not informed about type of drugs.

**Placebo**

Used

**Assignment**

Parallel

**Other design features**

**Secondary Ids**

empty

**Ethics committees**

1

**Ethics committee**

**Name of ethics committee**

Ethics committee of Iran University of Medical Sciences

**Street address**

Iran University of Medical Sciences, Shahid Hemmat Highway, Tehran

**City**

Tehran

**Province**

Tehran

**Postal code**

1449614535

**Approval date**

2019-03-10, 1397/12/19

**Ethics committee reference number**

IR.IUMS.REC.1397.1221

**Health conditions studied**

1

**Description of health condition studied**

Nonalcoholic fatty liver disease

**ICD-10 code**

K75.81

**ICD-10 code description**

Nonalcoholic steatohepatitis [NASH]

2

**Description of health condition studied**

Diabetes type 2

**ICD-10 code**

E11

**ICD-10 code description**

Type 2 diabetes mellitus

## Primary outcomes

### 1

#### Description

change of CAP (Controlled attenuation parameter)

#### Timepoint

at start and 24 weeks

#### Method of measurement

with fibroscan

## Secondary outcomes

### 1

#### Description

Weight

#### Timepoint

start and 12 weeks and 24 weeks after intervention

#### Method of measurement

with weight scale

### 2

#### Description

Nonalcoholic fatty liver disease fibrosis score

#### Timepoint

start and 24 weeks after intervention

#### Method of measurement

with use of labroatory tests and formula of the NAFLD fibrosis score

### 3

#### Description

FIB4 index

#### Timepoint

start and 24 weeks after intervention

#### Method of measurement

with use of labroatory tests and formula of the FIB4

### 4

#### Description

A/G (Android/Gynoid)

#### Timepoint

start and 24 weeks after intervention

#### Method of measurement

with Dual-energy X-ray absorptiometry (DEXA)

### 5

#### Description

Liver stiffness measurement (LSM)

#### Timepoint

start and 24 weeks after intervention

#### Method of measurement

Liver fibroscan

### 6

#### Description

VAT (Visceral adipose tissue)

#### Timepoint

start and 24 weeks after intervention

#### Method of measurement

with Dual-energy X-ray absorptiometry (DEXA)

### 7

#### Description

Body mass index

#### Timepoint

start and 12 weeks and 24 weeks after intervention

#### Method of measurement

with weight and height scale and formula

## Intervention groups

### 1

#### Description

Intervention group: Empagliflozin 10 milligram, Dr. Abidi pharmacy over 6 months

#### Category

Treatment - Drugs

### 2

#### Description

Intervention group: Pioglitazone 15 milligram, Dr. Abidi pharmacy over 6 months

#### Category

Treatment - Drugs

### 3

#### Description

Control group: placebo, Dr. Abidi pharmacy over 6 months

#### Category

Placebo

## Recruitment centers

### 1

#### Recruitment center

##### Name of recruitment center

Firoozgar hospital

##### Full name of responsible person

Haleh Chehrehgosha

##### Street address

Behafarin ST, Karimkhan AVE, Vali-asr Sq, Tehran, Iran

##### City

Tehran

##### Province

Tehran

##### Postal code

1593747811

##### Phone

+98 21 8214 1600

##### Email

hchehrehgosha@gmail.com

## Sponsors / Funding sources

### 1

#### Sponsor

**Name of organization / entity**

Iran University of Medical Sciences

**Full name of responsible person**

Dr. Kazem Malakuti

**Street address**

Iran University of Medical Sciences, Shahid Hemmat Highway, Tehran

**City**

Tehran

**Province**

Tehran

**Postal code**

1593747811

**Phone**

+98 21 8670 2503

**Email**

research@iums.ac.ir

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

Yes

**Title of funding source**

Iran University of Medical Sciences

**Proportion provided by this source**

75

**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

### 2

#### Sponsor

**Name of organization / entity**

Abidi pharmacy

**Full name of responsible person**

Elham Andalib

**Street address**

Ahmed Qusayr Street (Bucharest), below the Argentine Square. Alley 13. No. 5

**City**

Tehran

**Province**

Tehran

**Postal code**

1513815811

**Phone**

+98 21 4452 2451

**Email**

e.andalib@cobeldarou.com

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

Yes

**Title of funding source**

Abidi pharmacy

**Proportion provided by this source**

25

**Public or private sector**

Private

**Domestic or foreign origin**

Domestic

**Category of foreign source of funding**

*empty*

**Country of origin****Type of organization providing the funding**

Industry

## Person responsible for general inquiries

#### Contact

**Name of organization / entity**

Iran University of Medical Sciences

**Full name of responsible person**

Haleh Chehrehgosha

**Position**

Fellowship

**Latest degree**

Specialist

**Other areas of specialty/work**

Endocrinology & Metabolism

**Street address**

Behafarin ST, Karimkhan AVE, Vali-asr Sq, Tehran, Iran

**City**

Tehran

**Province**

Tehran

**Postal code**

1593747811

**Phone**

+98 21 8894 5246

**Fax****Email**

hchehrehgosha@gmail.com

## Person responsible for scientific inquiries

#### Contact

**Name of organization / entity**

Iran University of Medical Sciences

**Full name of responsible person**

Mohammad Ebrahim Khamseh

**Position**

Professor

**Latest degree**

Subspecialist

**Other areas of specialty/work**

Internal Medicine

**Street address**

Behafarin ST, Karimkhan AVE, Vali-asr Sq, Tehran, Iran

**City**  
Tehran  
**Province**  
Tehran  
**Postal code**  
1593747811  
**Phone**  
+98 21 8894 5246  
**Fax**  
**Email**  
khamseh.m@iums.ac.ir

Tehran  
**Postal code**  
1593747811  
**Phone**  
+98 21 8894 5246  
**Fax**  
**Email**  
hchehrehgosha@gmail.com

## Person responsible for updating data

### Contact

**Name of organization / entity**  
Iran University of Medical Sciences  
**Full name of responsible person**  
Haleh Chehrehgosha  
**Position**  
Fellowship  
**Latest degree**  
Specialist  
**Other areas of specialty/work**  
Endocrinology & Metabolism  
**Street address**  
Behafarin ST, Karimkhan AVE, Vali-asr Sq, Tehran,  
Iran  
**City**  
Tehran  
**Province**

## 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

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

### Statistical Analysis Plan

Undecided - It is not yet known if there will be 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