Clinical Trial Protocol
Iranian Registry of Clinical Trials

01 Nov 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 atenuated 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-notofied 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 labroatary 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 labroatary 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, KarimkhanAVE, Vali-asr Sq, Tehran, Iran

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

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

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