

# Clinical Trial Protocol

## Iranian Registry of Clinical Trials

14 Jun 2026

### Comparison of the therapeutic effect of empagliflozin with pioglitazone and vitamin E on non-alcoholic fatty liver in patients with type 2 diabetes

#### Protocol summary

##### Study aim

Comparison of the effect of empagliflozin with pioglitazone and vitamin E on liver enzymes and grades of fatty liver in type 2 diabetic patients with nonalcoholic fatty liver

##### Design

This is a randomized study with parallel groups on 66 patients to control diabetic patients with fatty liver with empagliflozin or pioglitazone and vitamin E. The subjects are randomly assigned to 1: 1 ratios in the intervention or control groups.

##### Settings and conduct

This study performed in patients with non-alcoholic fatty liver and diabetic who were assigned to the intervention and control groups. Patients who have evidence of fatty liver on ultrasound will be included or excluded to the study through inclusion and exclusion criteria.

##### Participants/Inclusion and exclusion criteria

Patients with non-alcoholic fatty liver disease (NAFLD) are referred to the Valiasr Hospitals in Tabriz. Inclusion criteria included: patients 18 - 75 years, BMI <45 kg / m<sup>2</sup>, a known case of type 2 diabetes used by metformin, a known case of fatty liver, HbA1c are between 6-8%. Exclusion criteria also included History of hypoglycemia liver disease Other than non-alcoholic fatty liver Previous use of thiazolidinedione treatment, immunomodulatory, antiobesity, anti-NASH glucagon-like peptide 1 agonists, sodium-glucose cotransporter 2 inhibitors, or vitamin E, amiodarone, tamoxifen, methotrexate In the last six months, severe heart, lung and kidney disease, Contraindications to the use of empagliflozin, Uncontrolled type 2 diabetes, Changes in diet and activity during the study.

##### Intervention groups

Intervention group will receive daily empagliflozin 10mg and metformin for 12 weeks, and the other group will receive daily pioglitazone 30 mg and vitamin E and metformin daily for 12 weeks.

##### Main outcome variables

Levels of AST, ALT and grades of fatty liver

#### General information

##### Reason for update

##### Acronym

##### IRCT registration information

IRCT registration number: **IRCT20190701044062N4**

Registration date: **2021-01-19, 1399/10/30**

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

Last update: **2021-01-19, 1399/10/30**

Update count: **0**

##### Registration date

2021-01-19, 1399/10/30

##### Registrant information

##### Name

manouchehr khoshbaten

##### Name of organization / entity

##### Country

Iran (Islamic Republic of)

##### Phone

+98 41 1334 3010

##### Email address

mkhoshbaten@yahoo.com

##### Recruitment status

**Recruitment complete**

##### Funding source

##### Expected recruitment start date

2020-11-23, 1399/09/03

##### Expected recruitment end date

2022-03-19, 1400/12/28

##### Actual recruitment start date

empty

##### Actual recruitment end date

empty

##### Trial completion date

empty

### Scientific title

Comparison of the therapeutic effect of empagliflozin with pioglitazone and vitamin E on non-alcoholic fatty liver in patients with type 2 diabetes

### Public title

Comparison of the therapeutic effect of empagliflozin with pioglitazone and vitamin E on non-alcoholic fatty liver in patients with type 2 diabetes

### Purpose

Treatment

### Inclusion/Exclusion criteria

#### Inclusion criteria:

18 to 75 years old BMI <45 kg/m<sup>2</sup> A known case of type 2 diabetes used by metformin A known case of non-alcoholic fatty liver HbA1c 6-8%

#### Exclusion criteria:

History of hypoglycemia liver disease Other than non-alcoholic fatty liver Previous use of thiazolidinedione treatment, immunomodulatory, antiobesity, anti-NASH glucagon-like peptide 1 agonists, sodium-glucose cotransporter 2 inhibitors, or vitamin E, amiodarone, tamoxifen, methotrexate In the last six months severe heart, lung and kidney disease Contraindications to the use of empagliflozin (drug allergy, recurrence of genital urinary tract infection, history of recent or previous gangrene) Uncontrolled type 2 diabetes Changes in diet and activity during the study

### Age

From **18 years** old to **75 years** old

### Gender

Both

### Phase

3

### Groups that have been masked

*No information*

### Sample size

Target sample size: **66**

### Randomization (investigator's opinion)

Randomized

### Randomization description

Patients will be randomly divided into control and intervention groups (1: 1). Patients will be assigned to two groups using the randomized block method. Patients will be divided into two equal groups using a random number table. STATA software will be used to generate a random sequence.

### 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

Ethics committee of Tabriz University of Medical Sciences

##### Street address

Central Office of Tabriz University of Medical Sciences  
Tabriz, Golghast Street

##### City

Tabriz

##### Province

East Azarbaijan

##### Postal code

5165663755

#### Approval date

2020-11-22, 1399/09/02

#### Ethics committee reference number

IR.TBZMED.REC.1399.796

## Health conditions studied

### 1

#### Description of health condition studied

Non

#### ICD-10 code

K76.0

#### ICD-10 code description

Fatty (change of) liver, not elsewhere classified

## Primary outcomes

### 1

#### Description

Liver enzymes levels before and after vitamin E and pioglitazone administration

#### Timepoint

At baseline and 3 months after the intervention

#### Method of measurement

Laboratory methods

### 2

#### Description

Ultrasound grade determination before and after vitamin E and pioglitazone administration

#### Timepoint

At baseline and 3 months after the intervention

#### Method of measurement

liver ultrasonography

### 3

#### Description

Liver enzymes levels before and after empagliflozin

#### Timepoint

At baseline and 3 months after the intervention

#### Method of measurement

Laboratory methods

#### 4

##### **Description**

Ultrasound grade determination before and after empagliflozin administration

##### **Timepoint**

At baseline and 3 months after the intervention

##### **Method of measurement**

liver ultrasonography

## **Secondary outcomes**

empty

## **Intervention groups**

#### 1

##### **Description**

Intervention group: Patients will receive daily empagliflozin 10 mg and metformin daily for 12 weeks.

##### **Category**

Treatment - Drugs

#### 2

##### **Description**

Control group: Patients will receive daily pioglitazone 30 mg, vit E and metformin for 12 weeks.

##### **Category**

Treatment - Drugs

## **Recruitment centers**

#### 1

##### **Recruitment center**

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

Valiasr Hospital

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

Manouchehr Khoshbaten

###### **Street address**

Aflaknoma Squ, Niayesh Blvd

###### **City**

Tabriz

###### **Province**

East Azarbaijan

###### **Postal code**

5166618564

###### **Phone**

+98 41 3327 3000

###### **Email**

tvaliasrhospital@gmail.com

## **Sponsors / Funding sources**

#### 1

##### **Sponsor**

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

Tabriz University of Medical Sciences

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

Ata Mahmoodpour

###### **Street address**

Golgasht Street

###### **City**

Tabriz

###### **Province**

East Azarbaijan

###### **Postal code**

5154751637

###### **Phone**

+98 41 3337 2084

###### **Email**

a.mahmoodpour@gmail.com

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

###### **Grant name**

###### **Grant code / Reference number**

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

Yes

###### **Title of funding source**

Tabriz University of Medical Sciences

###### **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**

Tabriz University of Medical Sciences

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

Manouchehr Khoshbaten

###### **Position**

Professor

###### **Latest degree**

Subspecialist

###### **Other areas of specialty/work**

Internal Medicine

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## Person responsible for scientific inquiries

### Contact

**Name of organization / entity**  
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**Position**  
Professor

**Latest degree**  
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## Person responsible for updating data

### Contact

**Name of organization / entity**  
Tabriz University of Medical Sciences

**Full name of responsible person**  
Manouchehr Khoshbaten

**Position**  
Professor

**Latest degree**

Subspecialist

### Other areas of specialty/work

Internal Medicine

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### Postal code

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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

No - There is not 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