

# Clinical Trial Protocol

## Iranian Registry of Clinical Trials

04 Jul 2026

### A study to compare the relative bioavailability of Maad and Merck tablet formulations of metformin 500 mg in 24 healthy adult volunteers under fasting conditions

#### Protocol summary

##### Study aim

The study aims to evaluate the bioequivalence of metformin 500 mg tablets produced by two different pharmaceutical companies under fasting conditions

##### Design

This randomized, single-dose, two-way, crossover study is conducted to compare the pharmacokinetics of metformin and Glucophage® tablets in 24 healthy adult volunteers. Volunteers will be sorted and receive a number from 1 to 24. In the first phase of the study, 12 volunteers will receive metformin manufactured by Maad and the remaining 12 volunteers will receive Glucophage® produced by Merck company. The administered drugs will be replaced to another group in the second phase of the study.

##### Settings and conduct

The dose administration and subsequent sample collection will be performed in Motahhari hospital (Gonbade Kavous, Iran).

##### Participants/Inclusion and exclusion criteria

Inclusion criteria: aged 18-55 years; subject available for the entire study period; willingness to adhere to protocol requirements as evidenced by written informed consent; good health at screening. Exclusion criteria: History of use of any drug; hypersensitivity or intolerance; significant history or current evidence of chronic disease; receipt of any drug as part of a research study within 30 days prior to the present study.

##### Intervention groups

First intervention group: A single 500 mg oral dose of metformin (1 tablet) manufactured by Maad company to 12 subjects. Second intervention group: A single 500 mg oral dose of Glucophage (1 tablet) manufactured by Merck company to 12 subjects. Since in this study, the volunteers will receive both test and reference drugs, each volunteer will act as his own control.

##### Main outcome variables

Maximum plasma drug concentration; Area under the plasma drug concentration-time curve

#### General information

##### Reason for update

##### Acronym

##### IRCT registration information

IRCT registration number: **IRCT20130626013776N100**

Registration date: **2022-07-13, 1401/04/22**

Registration timing: **prospective**

Last update: **2022-07-13, 1401/04/22**

Update count: **0**

##### Registration date

2022-07-13, 1401/04/22

##### Registrant information

##### Name

Hossein Amini

##### Name of organization / entity

Golestan University of Medical Sciences

##### Country

Iran (Islamic Republic of)

##### Phone

+98 17 1442 1651

##### Email address

hamini@sbmu.ac.ir

##### Recruitment status

**Recruitment complete**

##### Funding source

##### Expected recruitment start date

2022-08-23, 1401/06/01

##### Expected recruitment end date

2023-08-23, 1402/06/01

##### Actual recruitment start date

empty

**Actual recruitment end date**

empty

**Trial completion date**

empty

**Scientific title**

A study to compare the relative bioavailability of Maad and Merck tablet formulations of metformin 500 mg in 24 healthy adult volunteers under fasting conditions

**Public title**

Bioequivalence study of metformin 500 mg tablets

**Purpose**

Basic science

**Inclusion/Exclusion criteria****Inclusion criteria:**

18-55 years of age. The subject is able and willing to provide signed informed consent. The subject is available for the entire study period. Willing to adhere to protocol requirements as evidenced by written informed consent. The subject has a stable residence and telephone. Good health as determined by lack of clinically significant abnormalities in health assessments performed at screening.

**Exclusion criteria:**

History of allergy or sensitivity to metformin. History of any drug hypersensitivity or intolerance which, in the opinion of the investigator, would compromise the safety of the subject of the study. Significant history or current evidence of chronic infectious disease, system disorder or organ dysfunction. Presence of gastrointestinal disease or history of malabsorption within the last year. History of a medical disorders occurring within the last year that required hospitalization or medication. Use of pharmacologic agents known to significantly induce or inhibit drug-metabolizing enzymes within 30 days prior to dosing. Receipt of any drug as part of a research study within 30 days prior to the present study. Donation or significant loss of whole blood (480 ml or more) within 30 days prior to the present study.

**Age**

From **18 years** old to **55 years** old

**Gender**

Both

**Phase**

Bioequivalence

**Groups that have been masked**

*No information*

**Sample size**

Target sample size: **24**

More than 1 sample in each individual

Number of samples in each individual: **2**

In a crossover design, each person is its own control and receives two different interventions

**Randomization (investigator's opinion)**

Randomized

**Randomization description**

A pot sampling method will be used in this study. 12 papers are labeled "Reference Product" and 12 papers are written as "Test Product". The papers are then placed in sealed envelopes, and participants randomly select a paper and will be placed in the Reference or Test groups.

**Blinding (investigator's opinion)**

Not blinded

**Blinding description****Placebo**

Not used

**Assignment**

Crossover

**Other design features****Secondary Ids**

empty

**Ethics committees****1****Ethics committee****Name of ethics committee**

Ethics Committee of Golestan University of Medical Sciences

**Street address**

Falsafi Building, Sari Road Km 2

**City**

Gorgan

**Province**

Golestan

**Postal code**

4934174515

**Approval date**

2022-06-12, 1401/03/22

**Ethics committee reference number**

IR.GOUMS.REC.1401.111

**Health conditions studied****1****Description of health condition studied****ICD-10 code****ICD-10 code description****Primary outcomes****1****Description**

Maximum plasma drug concentration

**Timepoint**

At time zero and 1, 1.5, 2, 2.5, 3, 3.5, 4, 5, 6, 8, 10, 12 and 24 h after drug administration

**Method of measurement**

Blood sampling and measurement of drug concentrations by high-performance liquid chromatography

**2****Description**

Area under the plasma drug concentration-time curve

**Timepoint**

At time zero and 1, 1.5, 2, 2.5, 3, 3.5, 4, 5, 6, 8, 10, 12

and 24 h after drug administration

#### Method of measurement

Blood sampling and measurement of drug concentrations by high-performance liquid chromatography

## Secondary outcomes

### 1

#### Description

Plasma half-life

#### Timepoint

From the terminal 16 hours of plasma concentration-time profile

#### Method of measurement

Blood sampling and drug analysis by high-performance liquid chromatography method

## Intervention groups

### 1

#### Description

Intervention group: Oral administration of a single 500 mg dose of metformin (1 tablet) manufactured by Maad to healthy volunteers under fasting conditions in the morning of the experiment day

#### Category

Treatment - Drugs

### 2

#### Description

Intervention group: Oral administration of a single 500 mg dose of Glucophage (1 tablet) manufactured by Merck to healthy volunteers under fasting conditions in the morning of the experiment day

#### Category

Treatment - Drugs

## Recruitment centers

### 1

#### Recruitment center

##### Name of recruitment center

Dialysis Center, S. Motahhari Hospital

##### Full name of responsible person

Yahya Naserifard

##### Street address

Taleghani Street

##### City

Gonbade Kavous

##### Province

Golestan

##### Postal code

4916817693

##### Phone

+98 17 3252 5972

##### Fax

+98 17 3252 5972

##### Email

haminhplc@yahoo.com

## Sponsors / Funding sources

### 1

#### Sponsor

##### Name of organization / entity

Maad Pharmaceuticals

##### Full name of responsible person

Dr. MirAli Chavoshzadeh

##### Street address

Unit1, No. 5, 20th Street, Zafarghandi (Palizi) Street

##### City

Tehran

##### Province

Tehran

##### Postal code

1556613311

##### Phone

+98 21 8876 2283

##### Fax

+98 21 8876 1529

##### Email

info@maadpharma.ir

##### Web page address

http://maadpharma.ir

#### Grant name

Bioequivalence Study of Metformin

#### Grant code / Reference number

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

No

#### Title of funding source

Maad

#### Proportion provided by this source

100

#### 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

Gorgan University of Medical Sciences

##### Full name of responsible person

Hossein Amini

##### Position

Associate professor

##### Latest degree

Ph.D.

##### Other areas of specialty/work

Medical Pharmacy

##### Street address

Sari Road, Km 2

**City**

Gorgan

**Province**

Golestan

**Postal code**

4934174515

**Phone**

+98 17 3252 5972

**Fax**

+98 17 3252 5972

**Email**

haminhplc@yahoo.com

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

Gorgan University of Medical Sciences

**Full name of responsible person**

Hossein Amini

**Position**

Associate professor

**Latest degree**

Ph.D.

**Other areas of specialty/work**

Medical Pharmacy

**Street address**

Sari Road, Km 2

**City**

Gorgan

**Province**

Golestan

**Postal code**

4934174515

**Phone**

+98 17 3252 5972

**Fax**

+98 17 3252 5972

**Email**

haminhplc@yahoo.com

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

Gorgan University of Medical Sciences

**Full name of responsible person**

Hossein Amini

**Position**

Associate professor

**Latest degree**

Ph.D.

**Other areas of specialty/work**

Medical Pharmacy

**Street address**

Sari Road, Km 2

**City**

Gorgan

**Province**

Golestan

**Postal code**

4934174515

**Phone**

+98 17 3252 5972

**Fax**

+98 17 3252 5972

**Email**

haminhplc@yahoo.com

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

No - There is not a plan to make this available

**Justification/reason for indecision/not sharing IPD**

Data are confidential and need permission from the company.

**Study Protocol**

No - There is not a plan to make this available

**Statistical Analysis Plan**

No - There is not a plan to make this available

**Informed Consent Form**

No - There is not a plan to make this available

**Clinical Study Report**

No - There is not a plan to make this available

**Analytic Code**

No - There is not a plan to make this available

**Data Dictionary**

No - There is not a plan to make this available