

Clinical Trial Protocol

Iranian Registry of Clinical Trials

10 Jun 2026

Effects of N-acetylcysteine on the expression of UCP1, didinase type 2 and 3, as well as thyroid hormone receptors alpha and beta in visceral adipose tissue of obese adults

Protocol summary

Study aim

Determining the effects of N-acetylcysteine on the expression of UCP1, didinase type 2 and 3, as well as thyroid hormone receptors alpha and beta in visceral adipose tissue of obese adults

Design

A clinical trial with a control group, with parallel groups, randomized, phase 3, double-blind on 50 obese adults. Random allocation will be used as Stratified Randomization using the Permuted block randomization method with quadruple and double blocks.

Settings and conduct

This study will be conducted in the surgery and obesity clinic of Imam Hussein Hospital (Tehran, Iran) on 50 obese adults. The study will be conducted in a double-blind manner with a control group. Due to the double-blindness of the study, before the start of the study, the sets of cans containing capsules will be prepared by someone other than the researcher, and the placebo will be similar in appearance to the intervention group. The intervention group will receive 600 mg N-acetylcysteine per day and the control group will receive 600 mg placebo per day for 6 weeks. At the beginning and after 6 weeks, the different effects of the intervention on these people are examined and compared.

Participants/Inclusion and exclusion criteria

Entry requirements: People with obesity with a body mass index (BMI) greater than or equal to 30 kg/m², Age over 25 years, Non-pregnant, Non-lactating, Not suffering from chronic and acute inflammatory, and infectious diseases, Not suffering from high blood pressure and vascular diseases, Not receiving alcohol and smoking, Not participating in other clinical trial studies at the same time as the present study, Not receiving weight loss and antioxidant drugs and supplements in the last three months.

Intervention groups

The intervention and control groups will receive 600 mg of N-acetylcysteine supplement and placebo 6 weeks before sleeve surgery, respectively.

Main outcome variables

Weight, expression of UCP1, didinase type 2 and 3, thyroid hormone receptors alpha and beta

General information

Reason for update

Acronym

IRCT registration information

IRCT registration number: **IRCT20220727055563N2**

Registration date: **2023-07-01, 1402/04/10**

Registration timing: **prospective**

Last update: **2023-07-01, 1402/04/10**

Update count: **0**

Registration date

2023-07-01, 1402/04/10

Registrant information

Name

Hamid Zand

Name of organization / entity

Country

Iran (Islamic Republic of)

Phone

+98 21 2207 7424

Email address

hamidzand@gmail.com

Recruitment status

Recruitment complete

Funding source

Expected recruitment start date

2023-07-20, 1402/04/29

Expected recruitment end date

2023-09-11, 1402/06/20

Actual recruitment start date
empty

Actual recruitment end date
empty

Trial completion date
empty

Scientific title
Effects of N-acetylcysteine on the expression of UCP1, didinase type 2 and 3, as well as thyroid hormone receptors alpha and beta in visceral adipose tissue of obese adults

Public title
Effects of N-acetylcysteine on the expression of UCP1, didinase type 2 and 3, as well as thyroid hormone receptors alpha and beta in visceral adipose tissue of obese adults

Purpose
Treatment

Inclusion/Exclusion criteria
Inclusion criteria:
Obese people with a body mass index greater than or equal to 30 kg/m2. Age over 25 years Non-pregnant and lactating Not suffering from chronic and acute inflammatory, and infectious diseases Not suffering from high blood pressure and vascular diseases Not receiving alcohol and smoking
Exclusion criteria:
Receiving weight loss and antioxidant drugs and supplements in the last three months Participating in other clinical trial studies at the same time as the present study. Adherence to weight loss diets during the last three months. History of gastrointestinal or bariatric surgeries.

Age
From **25 years** old to **60 years** old

Gender
Both

Phase
3

Groups that have been masked

- Participant
- Investigator

Sample size
Target sample size: **50**

Randomization (investigator's opinion)
Randomized

Randomization description
Random allocation will be used as Stratified Randomization using the Permuted block randomization method with quadruple and double blocks. According to the sample size of 70 that has been determined, the quadruple and double blocks will be produced using the software. In the Stratified Randomization method, age and BMI will be used as layers. In order to apply concealment in the randomization process, unique codes will be used on medicine boxes, and the desired code will be generated by the software. As each person enters the study based on the generated sequence, the drug

package in which the desired code is recorded will be assigned to the person, and therefore, before choosing the person, no one will be aware of the type of treatment that the person will receive. Also, the random sequence generated during the study will be immune to prediction.

Blinding (investigator's opinion)
Double blinded

Blinding description
The study is double-blind. Participants will be divided into two groups receiving N-Acetylcysteine supplementation and the placebo group. Due to the double-blindness of the study, before starting the study, sets of cans containing N-Acetylcysteine supplementation will be prepared by someone other than the researcher, and the placebo will be similar in appearance to N-Acetylcysteine, so that the researcher does not know the type of treatment received by each group. In addition, the researcher in the evaluation phase of the desired outcomes (measurements of biochemistry and related gene expression) from the allocation of participants in each of the groups (intervention and control group) until after the end of the intervention period will be uninformed.

Placebo
Used

Assignment
Parallel

Other design features

Secondary Ids
empty

Ethics committees

1

Ethics committee
Name of ethics committee
Research Ethics Committees of National Nutrition & Food Technology Research Institute
Street address
No. 7, West Arghavan Ave., Farahzadi Blvd., Qods Town
City
Tehran
Province
Tehran
Postal code
1985717443

Approval date
2023-06-12, 1402/03/22

Ethics committee reference number
IR.SBMU.NNFTRI.REC.1402.012

Health conditions studied

1

Description of health condition studied
Obesity adults

ICD-10 code

E66

ICD-10 code description

Overweight and obesity

Primary outcomes

1

Description

Expression of UCP1 genes

Timepoint

At the end of week 6

Method of measurement

Using PCR (polymerase chain reaction)

Secondary outcomes

1

Description

Expression of didinase type 2 and 3 genes

Timepoint

The end of week 6

Method of measurement

Using PCR (polymerase chain reaction)

2

Description

Expression of alpha and beta thyroid hormone receptor genes

Timepoint

The end of week 6

Method of measurement

Using PCR (polymerase chain reaction)

3

Description

Serum level of thyroid hormones (TSH, T3 and T4)

Timepoint

At the beginning of the study and at the end of week 6

Method of measurement

Blood sampling and measurement by ELISA method

Intervention groups

1

Description

Intervention group: Daily 600 mg of NAC supplement prepared by Osvah Pharmaceutical Company of Iran for 6 weeks

Category

Treatment - Drugs

2

Description

Control group: Daily 600 mg maltodextrin supplement prepared by Karen Pharmaceutical Company of Iran for 6 weeks

Category

Placebo

Recruitment centers

1

Recruitment center

Name of recruitment center

Imam Hossein Hospital

Full name of responsible person

Hamid Zand

Street address

Imam Hossein (AS) Medical Research Training Center, Shahid Madani St, Tehran.

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Sponsors / Funding sources

1

Sponsor

Name of organization / entity

Shahid Beheshti University of Medical Sciences

Full name of responsible person

Afshin Zarghi, Vice President of Research and Technology, Shahid Beheshti University

Street address

Building No. 2 - 5th floor, Shahid Arabi St., Yemen St., Shahid Chamran highway, Tehran.

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Grant name

Grant code / Reference number

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

Yes

Title of funding source

Shahid Beheshti 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**

Shahid Beheshti University of Medical Sciences

Full name of responsible person

Hamid Zand

Position

Professor

Latest degree

Ph.D.

Other areas of specialty/work

Biochemistry

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

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Position

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

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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

There is no further information

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

Yes - There is a plan to make this available

Clinical Study Report

Yes - There is a plan to make this available

Analytic Code

Yes - There is a plan to make this available

Data Dictionary

Yes - There is a plan to make this available

Title and more details about the data/document

Information on the main implications can be shared at
the end of the study.

When the data will become available and for how long

The access period will be 6 months after the results are
published.

To whom data/document is available

The data from this study will be available only to
researchers working in academic and scientific
institutions.

Under which criteria data/document could be used

6 months after the publication of the articles obtained
from the data of this project, at the request of the person
in charge of the project and his consent, the study data
can be made available to researchers.

From where data/document is obtainable

-Applicants can contact the responsible author via email or the following mailing address to obtain the required data. Postal address: Tehran, Farahzadi Blvd., Tree St., Hafezi Alley, Faculty of Nutrition Sciences, Cellular-Molecular Group. Dr. Hamid Zand, email: hamidzand@gmail.com

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

Applicants will be able to access the study data by sending an email to the responsible author within a maximum of one week.

Comments