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Cardiometabolic effect of weight loss in metabolically healthy obese subjects

Submission date
06/07/2016

Recruitment status
No longer recruiting

Registration date
26/07/2016

Overall study status
Completed

Last Edited
18/08/2023

Condition category
Nutritional, Metabolic, Endocrine

[_] Prospectively registered
[_] Protocol
[_] Statistical analysis plan
[X] Results
[_] Individual participant data

Plain English summary of protocol

Background and study aims
Obesity is a growing concern worldwide, which can lead to serious health problems such as diabetes, heart disease and even cancer. Many obese patients experience changes to their metabolism (chemical process in the body to maintain life), which increases their risk of developing cardiovascular disease (disease of the heart and/or blood vessels). Metabolically healthy obesity (MHO) is a type of obesity in which there are no disruptions to metabolism. Currently, there are many discussions about whether MHO patients have a lower risk of developing diabetes or cardiovascular disease and if weight-loss can help further lower this risk. The Mediterranean diet is considered to be one of the healthiest diets worldwide, and particularly effective at helping prevent obesity. In addition, exercise has been shown to be extremely effective at helping people to lose weight as well as protecting against death and disease. The aim of this study is to find out whether weight-loss in MHO patients can help to prevent diabetes and cardiovascular disease.

Who can participate?
Adults aged between 35 and 55 with MHO.

What does the study involve?
Participants are randomly allocated to one of two groups. Participants in the first group consume a Mediterranean diet for two years. This diet involves using olive oil as the main source of dietary fat, increasing consumption of fruits, vegetables and fish, reducing consumption of red meat, and cutting out dairy products, sugary drinks and confectionery. Participants are also encouraged to practice daily exercise, which involves walking on average for 150 minutes every week for the two years of the study. Participants in the second group continue as normal for the duration of the study. Participants in both groups have their blood sugar measured at the start of the study and then after 3, 6, 12, 18 and 24 months in order to test for diabetes. Additionally, participants provide further blood samples to test levels of chemicals in the body which are important for metabolism and have their weight and blood pressure measured.

What are the possible benefits and risks of participating?
If participants continue the healthy lifestyle they adopt during this study, then it is likely to have long term benefits for their heart health. There are no notable risks involved with participating in this study.

Where is the study run from?
1. Regional Universitary Hospital of Malaga (Spain)
2. Hospital Virgen de la Victoria (Spain)

When is the study starting and how long is it expected to run for?
January 2012 to June 2016

Who is funding the study?
1. Instituto de Salud Carlos III (Spain)
2. FEDER Funds (Spain)

Who is the main contact?
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Contact information

Type(s)
Scientific

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Additional identifiers

EudraCT/CTIS number

IRAS number

ClinicalTrials.gov number

Secondary identifying numbers
HRM-MHO/12-01373

Study information

Scientific Title
Cardiometabolic effect of weight loss in metabolically healthy obese subjects (MHO)

Study objectives
The aim of this study is to investigate assess whether significant weight loss induces short-term metabolic benefits in metabolically healthy obese (MHO) individuals and whether the rate of weight loss influences the metabolic response to the intervention.

Ethics approval required
Old ethics approval format

Ethics approval(s)
Ethics approval by the institutional ethical committee (Comité Coordinador de Ética de la Investigación Biomédica de Andalucía), 20/04/2012, ref: 140402

Study design
Multi-centre randomized controlled trial

Primary study design
Interventional

Secondary study design
Randomised controlled trial

Study setting(s)
Hospital

Study type(s)
Treatment

Participant information sheet
Not available in web format, please use the contact details to request a patient information sheet

Health condition(s) or problem(s) studied
Obesity

Interventions
Participants are randomly allocated to one of two groups using a computer-generated sequence of random numbers.

Intervention group: Participants take up a Mediterranean diet for two years, which is based on the use of olive oil as the main source of visible fat and regular consumption of vegetables (≥2 servings / day), fruits (≥3 servings / day), legumes (≥3 servings / week) and fish (≥3 times a week), reducing the consumption of red meat or sausage (<2 times a week) and eliminating (or reducing

to <1 time / week) the consumption of dairy products, sugary drinks and confectionery. The recommended diet provide a calorie deficit of 600 Kcal/day. Participants are also encouraged to practice daily exercise, with a minimum target walk an average of 150 minutes a week for the two year duration of the study.
Participants receive nine medical visits throughout the study (every three months during the first year, then every six months) by the specialist physician and a nurse visit every four weeks during the first semester and then every 3 months until the end of the study (16 visits throughout the study). Checkups include general hygiene and dietary recommendations and clinical assessment.

Control group: Participants receive a minimum of four medical consultations and four nursing visits annually, which may be extended at the discretion of the physician or nurse responsible according to the associated pathology presented by the patient, according to standard clinical practice in these cases will be made. Checkups include general recommendations on heart-healthy diet and exercise, and identical clinical and analytical assessments as in the experimental group. During nursing visits (individual, 10 minutes) participants receive written information about diet and exercise without specific individual recommendations.

Participants are followed up at 3, 6, 12, 18 and 24 months for the intervention group and at 12, 18 and 24 months in the control group.

Intervention Type
Behavioural

Primary outcome measure
Type 2 diabetes and/or prediabetes incidence is determined by measuring:
1. Fasting plasma glucose levels at baseline, 3, 6, 12, 18 and 24 months
2. Oral glucose tolerance testat baseline, 12 and 24 months
3. Glycated hemoglobin (HbA1c) at baseline, 3, 6, 12, 18 and 24 months

Secondary outcome measures
1. Anthropometric variables are measured at baseline, 3, 6, 12, 18 and 24 months for the intervention group and at baseline, 12, 18 and 24 months in the control group.
1.1. Weight measured in kg on a scale
1.2. Waist circumfrence is measured in cm
1.3. BMI is calculated as the ratio between weight and height (kg/m2)
1.4. Blood pressure is measured using a validated automatic sphygmomanometer (OMRON M4-I) when the participant is in a sitting position.
2. Insulin resistance is calculated using the HOMA-IR index and proinsulin/insulin ratio at baseline, 12, 18 and 24 months
3. Serum lipid profile (HDL-cholesterol, LDL-cholesterol, Triglycerides) is measured using commercial equipment (Dimension®, Dade Behring, Germany) at baseline, 12, 18 and 24 months
4. Inflammatory parameters (leucocytes, fibrinogen, hs-CRP, IL-6, TNF-a) are measured using an Enzyme-Linked ImmunoSorbent Assay at baseline, 12, 18 and 24 months
5. Metabolic hormone (adiponectin and resistin) levels are measured using an Enzyme-Linked ImmunoSorbent Assay at baseline, 12, 18 and 24 months
6. Liver function is measured through serum liver function tests (AST, ALT, GGT) and Fatty Liver Index (FLI) at baseline, 12, 18 and 24 months

Overall study start date
01/01/2012

Completion date
30/06/2016

Eligibility

Key inclusion criteria
1. Aged 35-55 years
2. Metabolically healthy obese (MHO)*
3. BMI between 30-45 kg/m2

*A participant is considered to have MHO status when meeting ≤1 of these four metabolic syndrome criteria: fasting plasma glucose ≥100 mg/dL, blood pressure ≥135/85 mmHg (or use of blood pressure-lowering agents), HDL-cholesterol ≤50 mg/dL, and triglycerides ≥150 mg/dL (or use of lipid-lowering therapies).

Participant type(s)
Healthy volunteer

Age group
Adult

Lower age limit
35 Years

Upper age limit
55 Years

Sex
Both

Target number of participants
279

Key exclusion criteria
1. Diabetes or impaired glucose tolerance
2. Hypertension
3. Pregnancy or planning to become pregnant during the study
4. Cardiovascular disease
5. Severe systemic disease (advanced organ failure, dementia, cancer)
6. Immobilized individuals
7. Alcohol or drug abuse
8. Severe psychiatric illness
9. Patients who self-initiated a program of physical activity or started a diet in the past three months
10. Weight loss ≥5 kg in the last 6 months of unknown cause

Date of first enrolment
15/06/2013

Date of final enrolment

15/04/2014

Locations

Countries of recruitment
Spain

Study participating centre
Regional Universitary Hospital of Malaga
Avda. Hospital Civil s/n
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Study participating centre
Hospital Virgen de la Victoria
Campus de Teatinos s/n
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Sponsor information

Organisation
Fundación Pública Andaluza para la Investigación de Málaga en Biomedicina y Salud (FIMABIS)

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Sponsor type
Research organisation

ROR
https://ror.org/002nw1r81

Funder(s)

Funder type
Government

Funder Name
Instituto de Salud Carlos III

Alternative Name(s)
SaludISCIII, InstitutodeSaludCarlosIII, Instituto de Salud Carlos III | Madrid, Spain, Carlos III Institute of Health, Institute of Health Carlos III, Carlos III Health Institute, ISCIII

Funding Body Type
Government organisation

Funding Body Subtype
National government

Location
Spain

Funder Name
Federación Española de Enfermedades Raras

Alternative Name(s)
Spanish Federation for Rare Diseases, FEDER

Funding Body Type
Government organisation

Funding Body Subtype
National government

Location
Spain

Results and Publications

Publication and dissemination plan
Planned publication in a high-impact peer reviewed journal.

Intention to publish date
30/06/2017

Individual participant data (IPD) sharing plan

IPD sharing plan summary
Available on request

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Results article	results	01/07/2017		Yes	No
Other publications	Substudy results	12/02/2018	18/08/2023	Yes	No
Results article		09/04/2019	18/08/2023	Yes	No