Effects of Acetate on Insulin Sensitivity, CNS regulation of food intake and appetite in Humans

No registrations found.

Ethical review	Positive opinion
Status	Recruiting
Health condition type	-
Study type	Interventional

Summary

ID

NL-OMON21096

Source
Nationaal Trial Register

Brief title
AISCHA trial

Health condition

metabolic syndrome

Sponsors and support

Primary sponsor: Amsterdam University Medical Centersm location AMC
Source(s) of monetary or material Support: Amsterdam University Medical Centers

Intervention

Outcome measures

Primary outcome

The main objective of this study is to look at the effect of iv acetate infusion on postprandial glucose metabolism and whether this effect differs between healthy lean subjects and obese subjects with metabolic syndrome.

Secondary outcome

The secondary objectives of this study are to study the effects of acetate infusion on postprandial lipid and SCFA metabolism, plasma glucagon-like peptide-1 (GLP-1) and ghrelin levels, subjective ratings of appetite and CNS regulation of appetite

Study description

Background summary

Obesity is a major public health problem. Mounting evidence suggest a prominent role for the gut microbiome in pathophysiological pathways that influence the central nervous system (CNS) regulation of food intake. In this regard, the short-chain fatty acid (SCFA) acetate is one of the major metabolites produced by gut microbiota from dietary fibre. It has been established that acetate is absorbed into the blood stream and passes the blood brain barrier (BBB). In rodent studies, acetate has been shown to function as a beneficial substrate in hypothalamic brain regions to mediate both glucose metabolism and insulin secretion as central appetite regulation. However, certain other studies have shown contradicting results thus leaving the role of acetate in energy metabolism and appetite regulation controversial. Moreover, the metabolic effects of acetate may be different in insulin resistant subjects compared to the physiological situation. We therefore aim to study the acute effects of intravenous (iv) infusion of acetate on glucose metabolism and CNS regulation of food intake both in healthy lean subjects and in obese subjects with metabolic syndrome.

Study objective

We hypothesize that the metabolic effects of acute infusion of acetate are different in insulin resistant subjects compared to lean subjects.

Study design

Differences in postprandial plasma glucose and insulin will be compared between the acetate intervention and placebo condition by means of a 120min SMMT after either acetate or saline infusion

Intervention

intravenous infusion of acetate or saline

Contacts

Public
AMC
Max Nieuwdorp

0031 20 5666612
Scientific
AMC
Max Nieuwdorp

0031 20 5666612

Eligibility criteria

Inclusion criteria

Inclusion criteria healthy lean subject group:
- Healthy Caucasian male or female
- Age 40-65
- Women must be post-menopausal
- BMI range of 19-25 kg/m2
- Subjects should be able and willing to give informed consent.

Inclusion criteria obese metabolic syndrome subject group:
- Caucasian male or female with metabolic syndrome
- Age 40-65
- Women must be post-menopausal
- BMI range of 25-40 kg/m2
- At least 3 out of 5 NCEP metabolic syndrome criteria: fasting plasma glucose ≥ 5.6 mmol/L and/or HOMA-IR ≥ 2.5, triglycerides ≥ 1.6 mmol/L, waist-circumference > 102 cm, HDL cholesterol ≤ 1.04 mmol/L, blood pressure ≥ 130/85.
- Subjects should be able and willing to give informed consent.

Exclusion criteria

Exclusion criteria for all participants
- Systemic medication use, except for paracetamol
- Oral or intravenous antibiotics in the past 3 months before inclusion
- Smoking
- Substance abuse

- Contra-indication for MRI, such as claustrophobia or pacemaker

Study design

Design

Study type:	Interventional
Intervention model:	Crossover
Allocation:	Randomized controlled trial
Masking:	Double blinded (masking used)
Control:	Placebo

Recruitment

NL

Recruitment status:	Recruiting
Start date (anticipated):	12-02-2020
Enrollment:	60
Type:	Anticipated

IPD sharing statement

Plan to share IPD: No

Ethics review

Positive opinion

Date:	12-02-2020
Application type:	First submission

Study registrations

Followed up by the following (possibly more current) registration

No registrations found.

Other (possibly less up-to-date) registrations in this register

No registrations found.

In other registers

Register	ID
NTR-new	NL8381
Other	METC AMC : METC 2019_211

Study results

Summary results
are planned end 2022