The beta-2 adrenergic receptor in human BAT

No registrations found.

Ethical review	Positive opinion
Status	Recruitment stopped
Health condition type	-
Study type	Interventional

Summary

ID

NL-OMON27924

Source
Nationaal Trial Register

Brief title
ADRB2

Health condition

Obesity, cardiovascular diseases

Sponsors and support

Primary sponsor: NA
Source(s) of monetary or material Support: The Netherlands CardioVascular Research Initiative: the Dutch Heart Foundation, Dutch Federation of University Medical Centers, the Netherlands Organization for Health Research and Development and the Royal Netherlands Academy of Sciences (CVON2017-20 GENIUS-II).

Intervention

Outcome measures

Primary outcome

Glucose uptake by BAT, as measured by dynamic [18F]FDG PET/CT acquisition

Secondary outcome

- Resting energy expenditure, as measured by indirect calorimetry
- Serum markers for lipid metabolism (triglycerides (TG), total cholesterol (TC), high density lipoprotein-cholesterol (HDL-C), low density lipoprotein cholesterol (LDL-C), free fatty acids)
- Lipid pathway analysis using lipidomic analysis in plasma samples
- Serum markers for glucose metabolism (glucose, insulin)
- Circulating plasma BAT markers (e.g. microRNAs)

Study description

Background summary

The study is a randomized double-blinded cross-over trial, that will be carried out at the Leiden University Medical Center (LUMC). This trial encompasses one screening and two study days. This study will be carried out in 10 healthy white Caucasian males between 18 and 35 years old. For all subjects on both study days the intervention consists of intravenous (IV) injection of salbutamol. This will be combined with either placebo (day 1 or 2) or propranolol (day 1 or 2) oral capsules, which will be given 60 minutes prior to salbutamol injection. In addition, to visualize supraclavicular BAT all subjects will undergo a dynamic [18F]FDG PET/CT scan on both study days. The primary outcome is glucose uptake by BAT, as measured by dynamic [18F]FDG PET/CT acquisition. Other endpoints are resting energy expenditure, serum markers for lipid- and glucose metabolism, lipidomics and circulating batokines.

Study objective

We hypothesize that sympathetic activation of human BAT is mainly mediated by the ADRB2 rather than the ADRB3

Study design

0 and 1 week (cross-over)

Intervention

For all subjects on both study days the intervention consists of intravenous (IV) injection of salbutamol. This will be combined with either placebo (day 1 or 2) or propranolol (day 1 or 2) oral capsules, which will be given 60 minutes prior to salbutamol injection. In addition, to visualize supraclavicular BAT all subjects will undergo a dynamic [18F]FDG PET/CT scan on both study days.

Contacts

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Eligibility criteria

Inclusion criteria

- Dutch white Caucasian males
- Age between 18-35 years old
- Lean (BMI ≥ 18 and ≤ 25 kg/m2)

Exclusion criteria

- Diabetes mellitus (determined on basis of fasting glucose levels defined by ADA criteria)
- Any other active endocrine disease (thyroid disease, any signs of Cushing’s syndrome, adrenal disease and lipid-associated disorders such as familial hypercholesterolemia)
- Any cardiac disease (i.e. ischemic cardiac disease, arrhythmias, severe heart failure)
- A first-degree family member with sudden cardiac death
- Any chronic renal or hepatic disease
- Use of beta-adrenergic receptor agonists (for e.g. asthma)
- Use of medication known to influence glucose and/or lipid metabolism or brown fat activity (e.g. beta-blockers, antidepressants, corticosteroids)
- Use of medication shown to increase risk on hypokalemia after salbutamol administration (e.g. xanthine derivatives, steroids and diuretics)
- Any other contra-indications for the use of salbutamol or propranolol
- Abuse of alcohol or other substances
- Smoking
- Participation in an intensive weight-loss program or vigorous exercise program during the last year before the start of the study
- Current participation in another research projects that may influence the current research project

- Participation in another research with exposure to radiation burden within a year before the start of the current study
- Clinically relevant abnormalities in clinical chemistry or electrocardiogram (ECG) at screening (to be judged by the study physician)

Study design

Design

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

Recruitment

NL

Recruitment status:	Recruitment stopped
Start date (anticipated):	01-05-2021
Enrollment:	10
Type:	Actual

IPD sharing statement

Plan to share IPD: Undecided

Ethics review

Positive opinion

Date:	17-03-2021
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	NL9345
Other	METC-LDD : P20-113

Study results