Effects of weight loss on adipose tissue β2-adrenoceptor-stimulated lipolysis: role of adipose tissue oxidative stress and hypoxia

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The objective of the study is to investigate the change in β2-AR-stimulated lipolysis with weight loss and its association with changes in adipose tissue hypoxia and/or oxidative stress.

Ethical review	Approved WMO
Status	Recruitment stopped
Health condition type	Other condition
Study type	Observational invasive

Summary

ID

NL-OMON36127

Source
ToetsingOnline

Brief title
Weight loss and β2-adrenoceptor-stimulated lipolysis

Condition

- Other condition

Synonym
obesity

Health condition

vetweefseldisfunctie bij obesitas

Research involving

Human

Sponsors and support

Primary sponsor: Universiteit Maastricht
Source(s) of monetary or material Support: Ministerie van OC&W

Intervention

Keyword: &beta, 2-adrenergic receptor, hypoxia, lipolysis, oxidative stress

Outcome measures

Primary outcome

For the pre- and post-measurement a subcutaneous adipose tissue biopsy of about 1 gram will be taken. one part will be used to measure sensitivity to β2-AR stimulation of lipolysis with salbutamol in adipocytes isolated from the biopsy.

Secondary outcome

Another part of the adipose tissue biopsy will be used to measure markers of local adipose tissue hypoxia and oxidative stress with western blot and PCR techniques.

In addition a 5 ml venous blood sample and a small urine sample will be collected at both occasions. Markers of systemic oxidative stress will be measured in plasma and urine samples.

Study description

Background summary

Obesity is associated with impaired sensitivity of β2-adrenergic receptor (β2-AR)-stimulated lipolysis. Impaired lipolysis may be one factor contributing to maintenance of the obese state. Several studies have investigated the effects

of weight loss on β2-AR-stimulated lipolysis after weight stabilization. These studies suggest that in vitro lipolytic sensitivity to β2-AR stimulation of adipocytes increases after weight loss. Two possible mechanisms involved in β2-AR-stimulated lipolysis in obesity are adipose tissue hypoxia and oxidative stress. These factors have already been shown to be associated with obesity and with β-adrenergic sensitivity, but it is not clear yet whether these factors impair β2-AR-stimulated lipolysis in obese subjects. Our hypotheses are that weight loss increases sensitivity to β2-AR-stimulated lipolysis and that this goes together with decreases in adipose tissue hypoxia and/or oxidative stress.

Study objective

The objective of the study is to investigate the change in β2-AR-stimulated lipolysis with weight loss and its association with changes in adipose tissue hypoxia and/or oxidative stress.

Study design

This is a longitudinal study with one pre- and post-measurement. Subjects participating in an obesity treatment programme will be measured before the start of the programme and after 9 months participation. After 9 months in the treatment programme, subjects have reached relatively stable body weight and have on average lost 8.2% of their body weight .

Study burden and risks

This study has no direct benefits for the subjects but it sheds light on whether weight loss is able to improve β2-AR-sensitivity and possible mechanisms involved in decreased β2-AR-sensitivity in obesity. Two subcutaneous abdominal adipose tissue biopsies, two blood samples and two urine samples will be needed. The burdens from these procedures will be kept to a minimum.

Contacts

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Trial sites

Listed location countries

Netherlands

Eligibility criteria

Age
Adults (18-64 years)
Elderly (65 years and older)

Inclusion criteria

- All subjects entering the CO-Eur programme (life style intervention at the obesity treatment centre
CO-Eur in Heerlen). Co-Eur only includes subjects with age>18 years and BMI>30kg/m2
- No more than 3 kg weight change in the past 3 months
- age>18 years

Exclusion criteria

- Smoking
* Diabetes
* (Medicinal) use of β-blockers or β-agonists
* Pregnant women
- (medicinal) use of anticoagulantia or blood clotting problems

Study design

Design

Study type: Observational invasive
Masking: Open (masking not used)

Control:	Uncontrolled
Primary purpose:	Basic science

Recruitment

NL

Recruitment status:	Recruitment stopped
Start date (anticipated):	28-10-2011
Enrollment:	37
Type:	Actual

Ethics review

Approved WMO

Date:	30-06-2011
Application type:	First submission
Review commission:	METC academisch ziekenhuis Maastricht/Universiteit Maastricht, METC azM/UM (Maastricht)

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
CCMO	NL35932.068.11