60 hours of fasting and it's relationship with insulin resistance and mitochondrial function.

No registrations found.

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

Summary

ID

NL-OMON29104

Source NTR

Brief title Starvation study

Health condition

insulin resistance - insuline resistentie diabetes - diabetes mitochondrial function - mitochondiele functie oxidative capacity - oxidatieve capaciteit

Sponsors and support

Primary sponsor: Nutrition and Toxicology research Institute Maastricht (NUTRIM)
Maastricht University
PO Box 616, 6200 MD Maastricht
Source(s) of monetary or material Support: Nutrition and Toxicology research Institute
Maastricht (NUTRIM)
Maastricht University
PO Box 616, 6200 MD Maastricht

Intervention

Outcome measures

Primary outcome

Primary outcome parameters are skeletal muscle lipid accumulation and insulin sensitivity.

Secondary outcome

Secondary outcome measures are mitochondrial damage/oxidative capacity, Substrate oxidation en Energy expenditure

Study description

Background summary

Skeletal muscle mitochondrial dysfunction has been linked to the development of insulin resistance and type 2 diabetes mellitus. We have suggested that muscle mitochondrial dysfunction may result from lipotoxicity: fat accumulation in skeletal muscle – as observed in insulin resistance and diabetes - could lead to impaired mitochondrial function. Interestingly, prolonged fasting (short-term 'starvation') also results in intramyocellular lipid accumulation and insulin resistance. Whether the mechanisms underlying are comparable, is unknown and aim of the present study.

Study objective

Prolonged fasting-induced lipid accumulation accompanied by increased levels of DAG and ceramide, will interfere with insulin signaling explaining the insulin resistant glucose uptake. High levels off FFA might cause a decreased oxidative capacity

Study design

Insulin sensitivity is assessed after 60 hours, biopsies are taken after 60 hours in basal and insulin stimulated condition.

Additional blood samples are taken after 12,36 and 60 hours.

Intervention

12 healthy subjects wiil undergo in random order a 60h fast (calorie-free drinks only (S)) or a control diet (50-35-15% of energy as CHO, fat and protein (FED)). During the study, subjects stayed in a respiration chamber to measure energy expenditure and substrate oxidation.

Insulin-sensitivity was assessed using a hyperinsulinemic-euglycemic clamp. Muscle biopsies and blood samples were taken after each intervention period in basal and insulin-stimulated conditions. Oxidative capacity is measured with an oxygraph.

Contacts

Public

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Eligibility criteria

Inclusion criteria

- 1. Male sex;
- 2. Age 18-35 years;
- 3. BMI <25 kg/m2;
- 4. Sedentary;
- 5. Stable dietary habits;

- 6. Healthy;
- 7. No (first or second-degree) family member with diagnosed type 2 diabetes.

Exclusion criteria

- 1. Female sex;
- 2. Unstable body weight (weight gain or loss > 3 kg in the past three months);

3. Participation in a regular exercise training program during the last year before the start of the study;

- 4. Any medical condition requiring treatment and/or medication use;
- 5. Abuse of drugs and/or alcohol;
- 6. Participation in another biomedical study within 1 month before the first screening visit.

Study design

Design

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

Recruitment

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Recruitment status:	Recruitment stopped
Start date (anticipated):	07-01-2007
Enrollment:	12
Туре:	Actual

Ethics review

Positive opinion Date: Application type:

22-09-2009 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	NL1925
NTR-old	NTR2042
Other	METC University Maastricht : MEC 06-3-095
ISRCTN	ISRCTN wordt niet meer aangevraagd.

Study results

Summary results N/A