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

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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

Ethische beoordeling	Positief advies
Status	Werving gestopt
Type aandoening	-
Onderzoekstype	Interventie onderzoek

Samenvatting

ID

NL-OMON29104

Bron
Nationaal Trial Register

Verkorte titel
Starvation study

Aandoening

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

Ondersteuning

Primaire sponsor: Nutrition and Toxicology research Institute Maastricht (NUTRIM)
Maastricht University
PO Box 616, 6200 MD Maastricht
Overige ondersteuning: Nutrition and Toxicology research Institute Maastricht (NUTRIM)
Maastricht University
PO Box 616, 6200 MD Maastricht

Onderzoeksproduct en/of interventie

Uitkomstmaten

Primaire uitkomstmaten

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

Toelichting onderzoek

Achtergrond van het onderzoek

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.

Doel van het onderzoek

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

Onderzoeksopzet

Insulin sensitivity is assesed 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.

Onderzoeksproduct en/of interventie

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.

Contactpersonen

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Wetenschappelijk

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Deelname eisen

Belangrijkste voorwaarden om deel te mogen nemen (Inclusiecriteria)

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.

Belangrijkste redenen om niet deel te kunnen nemen (Exclusiecriteria)

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.

Onderzoeksopzet

Opzet

Type:	Interventie onderzoek
Onderzoeksmodel:	Cross-over
Toewijzing:	Gerandomiseerd
Blindering:	Enkelblind
Controle:	Geneesmiddel

Deelname

Nederland

Status:	Werving gestopt
(Verwachte) startdatum:	07-01-2007
Aantal proefpersonen:	12
Type:	Werkelijke startdatum

Ethische beoordeling

Positief advies

Datum:	22-09-2009
Soort:	Eerste indiening

Registraties

Opgevolgd door onderstaande (mogelijk meer actuele) registratie

Geen registraties gevonden.

Andere (mogelijk minder actuele) registraties in dit register

Geen registraties gevonden.

In overige registers

Register	ID
NTR-new	NL1925
NTR-old	NTR2042
Ander register	METC University Maastricht : MEC 06-3-095
ISRCTN	ISRCTN wordt niet meer aangevraagd.

Resultaten

Samenvatting resultaten
N/A