The effect of blood flow restriction with and without resistance exercise on muscle protein synthesis

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The main aim of the current study will be to assess the effect of acute blood flow restriction and blood flow restriction combined with resistance exercise on the muscle protein synthetic rate in healthy young male subjects

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

Summary

ID

NL-OMON43514

Source
ToetsingOnline

Brief title
Blood flow restriction (exercise)

Condition

- Other condition

Synonym
building muscle protein, muscle protein synthesis

Health condition

Effect van beperking van de bloedtoevoer naar spieren in rust en tijdens inspanning op de spiereiwit opbouw

Research involving
Human

Sponsors and support

Primary sponsor: Universiteit Maastricht
Source(s) of monetary or material Support: NWO (STW)

Intervention

Keyword: blood flow restriction, muscle protein synthesis, resistance exercise

Outcome measures

Primary outcome

The main study endpoint will be the 5 h muscle protein synthesis (MPS) rate

Secondary outcome

The early (0-2h) and late (2-5h) muscle protein synthesis

Study description

Background summary

The combined application of blood flow restriction and low load resistance exercise has been found to stimulate muscle protein synthetic rate to a similar extent as the traditional high load resistance exercise without blood flow restriction. However, it is still unclear whether blood flow restriction alone (without exercise) is a strong enough stimulus to significantly increase muscle protein synthesis.

Study objective

The main aim of the current study will be to assess the effect of acute blood flow restriction and blood flow restriction combined with resistance exercise on the muscle protein synthetic rate in healthy young male subjects

Study design

The present study will use a randomized, open labelled parallel study design.

Intervention

Two acute cycles of blood flow restriction of a lower extremity with or without

low load resistance exercise

Study burden and risks

The subjects will participate in 1 screening and 1 test day. They will be required to fill out a medical questionnaire during the screening session. A part of the subjects will also be asked to perform a 1-repetition maximum test during the screening session. They will receive a venous catheter that will be used for repeated blood draws during the test day and an amino-acid infusion that will stay in place until the test day has been completed. The subjects will be subjected to blood flow restriction in rest, or while performing resistance exercise, After this intervention, subjects will be monitored during a period of 5 hours in rest in which 3 biopsies from each leg will be taken. Subjects will be instructed to refrain from intense physical activity in the 48 h prior to the test day, and to avoid consumption of alcohol and caffeine in drinks in the 24 and 12 hours prior to the test day, respectively. Subjects will also be asked to avoid eating and drinking anything (except for water) from 22:00h the evening before a test day. There are no major risks of short term restriction of blood flow to a muscle except for the fact that the pressure of the cuff when inflated can cause some discomfort. Furthermore the risks of performing restriction exercise are also minimal and and comparably to the expected risks associated with exercise performance (such as fatigue, fainting and an abnormal blood pressure)

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

- Males
- Aged between 18-35 years
- Healthy
- 18.5<=BMI <=30 kg/m2

Exclusion criteria

- Smoking
- Resistance exercise >1 session/week
- Sports/exercise >3 session/week
- Lactose intolerant
- A history of neuromuscular problems
- Recent (<1 y) participation in amino acid tracer studies
- Individuals on any medications known to affect protein metabolism (i.e. corticosteroids, non-steroidal anti-inflammatories, or prescription acne medications).

Study design

Design

Study type:	Interventional
Intervention model:	Parallel
Masking:	Open (masking not used)
Control:	Uncontrolled
Primary purpose:	Treatment

Recruitment

NL

Recruitment status:	Recruitment stopped
Start date (anticipated):	08-07-2016
Enrollment:	25
Type:	Actual

Ethics review

Approved WMO Date:	13-04-2016
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

ID: 24024
Source: NTR
Title:

In other registers

Register	ID
CCMO	NL56003.068.15
OMON	NL-OMON24024