Assessment of a novel strategy to attenuate muscle mass loss during 2 weeks of bed rest

No registrations found.

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

Summary

ID

NL-OMON22281

Source
Nationaal Trial Register

Brief title
Bed Rest & Muscle Mass

Health condition

Disuse, Immobilization, Injury

Sponsors and support

Primary sponsor: Maastricht University
Source(s) of monetary or material Support: Maastricht University

Intervention

Outcome measures

Primary outcome

To assess the amount of muscle mass that is lost following 2 weeks of bed rest and whether BFR can be applied to effectively preserve muscle mass and strength during bed rest.

Secondary outcome

To assess differences in muscle fiber cross-sectional area (CSA), satellite cell content/activation, muscle fiber vascularization, muscle protein synthesis rates between both legs (BFR vs control), muscle strength, whole-body fat mass, adipose tissue gene expression and oral glucose tolerance before and after 2 weeks of bed rest.

Study description

Background summary

Several situations, such as spaceflight, injury and illness, necessitate prolonged periods of muscle disuse or unloading in otherwise healthy humans. Under such conditions, there is a progressive loss of skeletal muscle mass and strength, a reduction in insulin sensitivity, a decline in basal metabolic rate, and a concomitant increase in body fat mass. As a consequence, performance and metabolic health detriments ensue rapidly, providing an immediate need for effective countermeasures in order to minimize the subsequent rehabilitation efforts that are required.

It has previously been observed that applying blood flow restriction (BFR) during 2-weeks of immobilization of the lower extremity attenuated the decrease in muscle strength and effectively diminished the disuse atrophy of thigh muscles. These findings suggest that applying BFR may be an effective strategy to attenuate skeletal muscle mass loss during a period of bed rest.

Study objective

We hypothesize that applying BFR will decrease the loss in leg muscle mass during 2 weeks of bed rest.

Study design

Pre and post 2-wk bed rest.

Intervention

The main intervention: the amount of muscle mass that is lost following 2 weeks of bed rest will be assessed and whether BFR can be applied to effectively preserve muscle mass and strength during bed rest. In addition, we would like to assess the effects of 2 weeks of bed rest on changes in body composition and adipose tissue function and gain insights into the (potential) cellular mechanisms that occur during a period of bed rest.

Contacts

Public
Maastricht University, Dep. Human Biology

Cas Fuchs
Maastricht
The Netherlands
0433881381
Scientific
Maastricht University, Dep. Human Biology

Cas Fuchs
Maastricht
The Netherlands
0433881381

Eligibility criteria

Inclusion criteria

• Healthy males

• Age between 18 and 35 y

• BMI between 18.5 and 30 kg/m2

Exclusion criteria

• Smoking

• Type 2 Diabetes Mellitus

• Any back/leg/knee/neck/postural complaints

• Any history and/or family history of thrombosis

• All co-morbidities interacting with mobility and muscle metabolism of the lower limbs (e.g. arthritis, spasticity/rigidity, all neurological disorders and paralysis)

• Myocardial infarction within the last 3 years

• Use of certain anti-coagulants (use of thrombocyte aggregation inhibitors such as Ascal, acetylsalicylic acid, aspirin and carbasalaatcalcium is permitted. Use of other thrombocyte aggregation inhibitors will be discussed with the responsible physician)

• Performing regular resistance training (3+ times per week, carrying out progressive training) in the previous 6 months

• Hypertension (according to WHO criteria) and/or cardiovascular disease

• A history of deep vein thrombosis (DVT) in the leg

• Having donated blood in the 3 months prior to the study

Study design

Design

Study type:	Interventional
Intervention model:	Parallel
Allocation:	Non controlled trial
Masking:	Single blinded (masking used)
Control:	N/A , unknown

Recruitment

NL

Recruitment status:	Recruitment stopped
Start date (anticipated):	01-07-2017
Enrollment:	12
Type:	Actual

IPD sharing statement

Plan to share IPD: Undecided

Ethics review

Positive opinion

Date:	14-04-2017
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	NL6222
NTR-old	NTR6378
Other	METC azM/UM : METC173014

Study results

Summary results
n/a