The effect of carbohydrate and protein co-ingestion on exercise-induced muscle damage and overnight post-exercise muscle recovery.

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

Summary

ID

NL-OMON30411

Source
ToetsingOnline

Brief title
nutrition and post-exercise muscle recovery

Condition

- Other condition

Synonym
nvt

Health condition

geen aandoening

Research involving

Human

Sponsors and support

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

Intervention

Keyword: carbohydrate, muscle damage, post-exercise recovery, protein

Outcome measures

Primary outcome

The additional increase in muscle protein synthesis in the carbohydrate plus protein trial, compared to the carbohydrate and placebo trial, will be determined by measuring the enrichment of amino-acid-isoptopes in muscle biopsies and plasma samples.

Secondary outcome

The expected decrease in exercise-induced muscle damage, by the intake of carbohydrate plus protein during exercise compared to the intake of carbohydrate or water only, will be determined by measuring several markers of muscle damage in blood plasma and muscle samples.

Study description

Background summary

In the absence of food intake, the post-exercise protein balance (synthesis-breakdown) in the muscle is negative. The intake of protein, or protein plus carbohydrate increases protein synthesis and reduces breakdown and thereby creating a positive muscle protein balance. These results are obtained in research with subjects in the fasted state, which means that they didn't consume any food before or during exercise. This isn't representive for a situation in which people practice sports in the evening after a day of normal

food intake. One could state that a normal daily caloric intake provides enough substrate for muscles to recover from exercise. Our hypothesis is that, even in the fed state, the intake of carbohydrate and protein during and after exercise is important in post exercise muscle recovery and to diminish the rise in muscle damage during exercise.

Study objective

The aims of this proposal are to show that, additional to a normal daily food intake, the intake of carbohydrate and protein during and post-exercise increases muscle protein synthesis. Second, that the intake of carbohydrate and protein during exercise will diminish the exercise-induced muscle damage.

Study design

All subjects will perform two trials, separated by two weeks, in which he will receive a differtent drink on each trial day. The subject will serve as his own control. The drinks will be served in a randomised and double blind order.

Intervention

A trial begins with a 1 hour resting period, to get a steady state for the amino acid tracer, followed by the first muscle biopsy. Then the training protocol starts, which consists of a 40 min interval-cycling program and 80 min resistance exercise. A second biopsy is taken and subjects are allowed to rest supine for two hours, before they go to sleep. During exercise (every 15 min) and at two timepoints post exercise (30 and 90 min) they receive a certain amount of the test drink. Every half hour, and during exercise every 15 min, a blood sample is taken from a heated hand vein. After a sleeping period of 7 hours the last muscle biopsy is taken. Stable amino-acid isotopes are given by venous infusion during the entire test period.

Study burden and risks

The burden for the subjects consists of two half days and two evenings +nights. The risks associated with participation are minimal. Muscle biopsies and placement of the catheters can result in a local heamatoma. All procedures will be performed with steril equipment and the muscle biopsies are taken by an experienced physician.

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

age 18-30
body mass index < 25 kg/m2
not engaged in any regular exercise programm
no use of medication

Exclusion criteria

female
other ages than indicated in the inclusion criteria
body mass index > 25 kg/m2
participation in any regular exercise program or resistance exercise
use of medication

Study design

Design

Study type:	Interventional
Intervention model:	Parallel
Allocation:	Randomized controlled trial
Masking:	Double blinded (masking used)
Control:	Placebo
Primary purpose:	Other

Recruitment

NL

Recruitment status:	Recruitment stopped
Start date (anticipated):	17-07-2006
Enrollment:	24
Type:	Actual

Ethics review

Approved WMO

Date:	24-05-2006
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	NL11273.068.06