The effect of cold-water immersion on muscle blood flow and recovery after resistance exercise

No registrations found.

Ethical review	Positive opinion
Status	Pending
Health condition type	-
Study type	Interventional

Summary

ID

NL-OMON24418

Source
NTR

Brief title
Cold Flow

Health condition

/

Sponsors and support

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

Intervention

Outcome measures

Primary outcome

The primary outcome is microvascular blood flow expressed in arbitrary units measured in rest, following a bout of resistance-type exercise, immediately following the cold/thermoneutral water bath, and 60 and 180 min following the cold/thermoneutral water

bath. Microvascular blood flow is measured with contrast-enhanced ultrasound.

Secondary outcome

Secondary outcomes include femoral artery blood flow expressed as L/min (measured with Doppler ultrasound at the same time points as microvascular blood flow) and L-[ring-13C6]-phenylalanine enrichment in mixed muscle protein expressed as mole percent excess measured with gas-chromatography-combustion isotope ratio mass spectrometry at 4 hours following the cold/thermoneutral water bath.

Study description

Background summary

Cold-water immersion (CWI) is a frequently applied strategy to accelerate post-exercise recovery in both recreational as well as professional athletes. However, recent insights suggest that CWI following a bout of resistance-type exercise can blunt recovery by lowering muscle protein synthesis rates. It has been speculated that CWI lowers muscle protein synthesis rates by restricting blood flow in and towards muscle tissue. The objective of this study is to assess the acute effect of CWI on muscle macro-, microvascular blood flow, and amino acid incorporation in muscle tissue during post-exercise recovery in healthy young males.

Study objective

We hypothesize that 20 min of one-legged CWI at 8 degrees Celsius (°C) will lower macro-, microvascular blood flow, and amino acid incorporation in muscle tissue following a bout of resistance-type exercise training when compared with the thermoneutral water immersed control (CON) leg (20 min at 30 °C).

Study design

Microvascular (primary outcome) and femoral artery (secondary outcome) blood flow will be assessed in rest, following a bout of resistance-type exercise, immediately following the cold/thermoneutral water bath, and 60 and 180 min following the cold/thermoneutral water bath. L-[ring-13C6]-phenylalanine enrichment in mixed muscle protein (secondary outcome) will be assessed at 4 hours following the cold/thermoneutral water bath.

Intervention

Cold-water immersion

Contacts

Public
Maastricht University
Milan Betz

0433881509
Scientific
Maastricht University
Milan Betz

0433881509

Eligibility criteria

Inclusion criteria

- Aged between 18-35 years
- Healthy, recreationally active
- Male
- BMI < 30 kg/m2

Exclusion criteria

- Smoking
- Allergies to milk proteins (whey or casein)
- Arthritic conditions
- 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 strength acne medications)
- Individuals with gastrointestinal diseases

Study design

Design

Study type: Interventional

Intervention model:	Other
Allocation:	Non controlled trial
Masking:	Open (masking not used)
Control:	N/A , unknown

Recruitment

NL

Recruitment status:	Pending
Start date (anticipated):	01-11-2021
Enrollment:	13
Type:	Anticipated

IPD sharing statement

Plan to share IPD: Undecided

Ethics review

Positive opinion

Date:	07-10-2021
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	NL9811

Register	ID
Other	METC MUMC+ : METC 21-049

Study results