Differences in total power output between regular cycling and combined arm and leg cycling, and the influence on cycling efficiency, oxygen uptake, heart rate, muscle activity and rated perceived exertion.

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The primary objective is determining whether adding arm propulsion to regular cycling increases total power output. Secondary objectives are determining differences in cycling efficiency, heart rate, muscle activation, maximal oxygen uptake (V02max...

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

Summary

ID

NL-OMON42125

Source
ToetsingOnline

Brief title
Cycling with arms and legs

Condition

- Other condition

Synonym
None

Health condition

Geen

Research involving
Human

Sponsors and support

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

Intervention

Keyword: Additional muscle mass, Cycling, Peripheral fatigue, Power output

Outcome measures

Primary outcome

The difference in total power output, in percentage, between the regular cycling test and the combined arm- and leg cycling test will be the primary endpoint of this study.

Secondary outcome

Secondary endpoints are differences in cycling efficiency, heart rate, muscle activity, VO2 and RPE.

Study description

Background summary

Several types of sports rely on both arm- and leg propulsion to generate propulsive power. Comparing situations in which the arms or legs have been excluded, with combined arm- and leg propulsion points to an advantageous effect of additional muscle mass in these sports. It is hypothesized that adding arm propulsion to regular cycling also yields an increased power output.

Study objective

The primary objective is determining whether adding arm propulsion to regular cycling increases total power output. Secondary objectives are determining

differences in cycling efficiency, heart rate, muscle activation, maximal oxygen uptake (V02max) and rated perceived exertion (RPE) between regular cycling and combined arm and leg cycling.

Study design

The study will be a randomized controlled cross-over trial with a total of 18 subjects. All subjects will perform a regular cycling test and a combined arm- and leg cycling test.

Intervention

Both groups will perform a maximal power test with combined arm and leg propulsion as intervention. Furthermore, the subjects will perform a maximal power test for regular cycling as a control intervention.

Study burden and risks

Subjects will be asked to visit the researchers three times. Each visit lasts about one hour. During the first visit, prior to any of the measurements, the subjects will sign the informed consent. Subsequently, an intake interview to determine the health of potential subjects will be performed, based on the 'baseline' in the CRF. If the potential subjects meet the inclusion criteria, he or she will perform a familiarization trial with combined arm and leg propulsion on the bicycle. During visit 2 and 3, the subjects will perform a maximal power test, once with additional arm propulsion and once without, both tests are separated by a resting period of one week. Only possible risk of this study for subjects is temporary overuse of muscles or the cardiopulmonary system.

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

- Men and women aged 18 * 35 years.
- 19 kg/m2 < BMI < 25 kg/m2.
- Able to read and understand Dutch.
- Playing sport/exercising on average at least 2 hours each week.
-Informed consent (IC).

Exclusion criteria

- Hypertension, blood pressure > 140/90 mm Hg.
- (Previous) cardiovascular disease (e.g.: coronary artery disease, cardiomyopathy, heart failure, cardiac dysrhythmias), NYHA class 2 or higher.
- (Previous) respiratory disease (e.g.: asthma or COPD (bronchitis, lung emphysema or cystic fibrosis), NYHA class 2 or higher.
- Diabetes mellitus (type 1 and 2).
- Other assessed physical impairments that reduce performance during cycling (limited degree of freedom of ankle, knee or hip, or contusion of involved limbs).
- Performance of strenuous physical activity on the day before or 2 days before the tests.
- Any condition that according to the researchers would interfere with the tests

Study design

Design

Study type: Interventional

Intervention model:	Crossover
Masking:	Open (masking not used)
Control:	Uncontrolled
Primary purpose:	Other

Recruitment

NL

Recruitment status:	Recruitment stopped
Start date (anticipated):	18-05-2015
Enrollment:	18
Type:	Actual

Ethics review

Approved WMO

Date:	16-04-2015
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: 26883
Source: Nationaal Trial Register
Title:

In other registers

Register	ID
CCMO	NL52388.068.15

Register	ID
Other	NTR 21828
OMON	NL-OMON26883