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Which form of endurance exercise in water is better for weight loss continuous low intensity or short high intensity endurance exercise?

Submission date
26/02/2013

Recruitment status
Stopped

Registration date
14/03/2013

Overall study status
Stopped

Last Edited
18/01/2019

Condition category
Nutritional, Metabolic, Endocrine

[X] Prospectively registered
[X] Protocol
[_] Statistical analysis plan
[_] Results
[_] Individual participant data
[_] Record updated in last year

Plain English summary of protocol

Background and study aims
We are carrying out a study on 10 to 14 overweight persons to find the best form of endurance exercise (exercise to build up stamina) in water for weight loss. Continuous endurance exercise improves fat metabolism. Fat metabolism can be further improved using high intensity intermittent exercise. When exercising in water a physiological agent that is produced in the heart called atrial natriuretic peptide (ANP) is released. This agent leads to an improved mobilization of body fat. The combined effects of endurance exercise and water immersion may help to reduce bodyweight in an optimal way.

Who can participate?
Healthy overweight men aged between 18 and 50 years

What does the study involve?
The participants` physical fitness will be tested before the actual testing procedure. Body fat will be measured. Then the participants will be allocated to either the High Intensity Group or the Continuous Exercise Group by a process called randomisation which is like a coin toss. Then the participants will change groups and exercise modalities. At the end of the study we will compare the effectiveness of the two different exercise modalities in regard to optimum weight loss.

What are the possible benefits and risks of participating?
Participants will gain insight into physiological research. Moreover, the results of the ECG, the lung function test and the exercise test will be discussed. Adequate health focused training recommendations will be provided.
Study will be only conducted with healthy men without detected risk factors. The risk of an undetected coronary heart disease and sudden death will be reduced to a large extent by the preliminary medical check-up. The risk increases with age; therefore the age limit is 50 years. A defibrillator will be available. Moreover, the standard emergency equipment required will be on hand.

Where is the study run from?
Medical Health Centre, Bad Ragaz, Switzerland

When is the study starting and how long is it expected to run for?
The study will start on in July 2013 and will run for three months

Who is funding the study?
Health Centre St Gallen (Gesundheitszentrum St Gallen), Switzerland

Who is the main contact?
Dr Beat Knechtle
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Contact information

Type(s)
Scientific

Contact name
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Additional identifiers

EudraCT/CTIS number

IRAS number

ClinicalTrials.gov number

Secondary identifying numbers
N/A

Study information

Scientific Title
Does continuous endurance exercise in water elicit a higher release of atrial natriuretic peptide (ANP) and a higher plasma concentration of free fatty acids (FFAs) in pre-obese and obese men than high intensity intermittent endurance exercise? A pilot study

Study objectives
The aims of the study are to investigate:
1. Whether continuous endurance exercise or high intensity intermittent endurance exercise in

water elicits both a higher release of ANP and a higher plasma concentration of FFAs
2. To determine whether continuous endurance exercise in water or a high intensity intermittent endurance exercise in water would lead to a more pronounced short term (two hours) excess post-exercise oxygen consumption (EPOC) effect.

Ethics approval required
Old ethics approval format

Ethics approval(s)
Ethics Committee St. Gallen, Switzerland, 09/03/2011, Ref: 11/026

Study design
Randomized cross over trial

Primary study design
Interventional

Secondary study design
Randomised controlled trial

Study setting(s)
Hospital

Study type(s)
Screening

Participant information sheet
Not available in web format, please use the contact details below to request a patient information sheet

Health condition(s) or problem(s) studied
Obesity

Interventions
Ten to fourteen healthy sedentary pre-obese and obese class-1 men with a body mass index (BMI) ranging from 25 34.99kg/m2 according to WHO 2004 will be scrutinized with regard to their metabolic responses to a continuous exercise in water and to a high intensity endurance exercise in water. Both trials will be matched for energy expenditure. After preliminary testing, the tests will be conducted as repeated measurements. The two different exercise protocols [Continuous endurance exercise and High intensity intermittent endurance exercise] will be compared.

Blood samples will be taken by laboratory assistants who are familiar with the operating procedures and safety standards.
During the trial blood samples will be taken every 15 minutes (continuous endurance exercise) or after each exercise step (high intensity intermittent endurance exercise). Moreover, one blood sample will be taken pre- and post-exercise.

Intervention Type
Other

Phase
Not Applicable

Primary outcome measure
1. ANP
2. Respiratory exchange rate (RER). The RER specifies the ratio of carbon dioxide (CO2) eliminated to oxygen (O2) consumed. The RER depends on the metabolic substrate used for generating energy. Using stoichiometric equations, the RER can be applied to determine the amounts of carbohydrates and fatty acids metabolized. Energy production can also be reliably estimated in the same manner.
3. The rating of perceived exertion (RPE). The RPE method requires that a person subjectively rates how difficult the work is, using a numerical scale that is related to exercise intensity.

Secondary outcome measures
1. Free fatty acids
2. Lactate
3. Catecholamines (adrenaline, noradrenaline, dopamine)
4. Growth hormone (GH)
5. Insulin
6. Glycerol
All of which indicate changes in the metabolic process.

Overall study start date
01/07/2013

Completion date
01/10/2013

Reason abandoned (if study stopped)
Lack of funding/sponsorship

Eligibility

Key inclusion criteria
1. Male gender (Differences in estrogen concentrations between men and woman result in greater reliance on fat oxidation during exercise in woman. Between the different phases of the female menstrual cycle substrate utilization also varies)
2. Body-Mass-Index >25 and <34.99 kg/m2
3. Age > 18 and <50 years
4. Verbal and written information of the participants, signed declaration of consent
5. No cardiovascular risk [completion of the Physical Activity Readiness Questionnaire (PAR-Q)]

Participant type(s)
Patient

Age group
Adult

Lower age limit
18 Years

Sex
Male

Target number of participants
10 to 14

Key exclusion criteria
1. Female gender
2. Cardiac insufficiency > New York Heart Association (NYHA) 1
3. Continuous arrhythmia
4. Respiratory obstruction
5. High blood pressure (> 140/90mmHg)
6. Body-Mass-Index <25 and >34,99 kg/m2
7. Age <18 and >50 years
8. Any medication
9. Signed declaration of consent missing

Date of first enrolment
01/07/2013

Date of final enrolment
01/10/2013

Locations

Countries of recruitment
Switzerland

Study participating centre
Facharzt FMH fur Allgemeinmedizin
St Gallen
Switzerland
9001

Sponsor information

Organisation
Health Centre St Gallen (Gesundheitszentrum St Gallen) (Switzerland)

Sponsor details
c/o Beat Knechtle
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9001

Sponsor type
Hospital/treatment centre

Funder(s)

Funder type
Hospital/treatment centre

Funder Name
Health Centre St Gallen (Gesundheitszentrum St Gallen) (Switzerland)

Results and Publications

Publication and dissemination plan
Not provided at time of registration

Intention to publish date

Individual participant data (IPD) sharing plan

IPD sharing plan summary
Not provided at time of registration

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Protocol article	protocol	10/10/2013		Yes	No