

High intensity exercise may be an efficient strategy for obesity management

Submission date 26/02/2016	Recruitment status No longer recruiting	<input type="checkbox"/> Prospectively registered <input type="checkbox"/> Protocol <input type="checkbox"/> Statistical analysis plan <input checked="" type="checkbox"/> Results <input type="checkbox"/> Individual participant data
Registration date 01/03/2016	Overall study status Completed	
Last Edited 30/11/2020	Condition category Nutritional, Metabolic, Endocrine	

Plain English summary of protocol

Background and study aims

Sedentary behaviour (taking part in less than an hour a week of physical activity) is associated with an increased risk of heart disease, type 2 diabetes and some forms of cancer, as well as poorer mental wellbeing. It is a growing problem, and is thought to contribute significantly to the high levels of obesity worldwide. For many people, not having enough time to exercise is often used as an excuse for sedentary behaviour. There is therefore a growing amount of research looking into exercise strategies that involve a shorter time commitment but still provide health benefits. A recent study showed that very brief high-intensity exercise in the form of sprinting, made up of sprints lasting for 6-10 seconds, was found to be motivating and tolerable for participants and can even help to burn fat. The aim of this study is to find out whether taking part in high intensity exercise for six weeks can help improve blood sugar control, BMI and physical fitness in young obese adults.

Who can participate?

Obese adults aged between 18 and 30 who have a sedentary lifestyle.

What does the study involve?

Participants are randomly allocated to one of two groups. Those in the first group take part in the training program, which consists of three training sessions per week for six weeks (a total of 18). Those in the second group do not take part in any training during the 6 weeks and are also asked to consume their normal diet and to maintain their typically sedentary behavior during the training period. At the start of the study, after the program ends and then 24, 72 hours and two weeks after the final session, participants in both groups complete a number of tests in order to assess how well their bodies are able to process sugar, physical characteristics (such as weight) and how physically fit they are.

What are the possible benefits and risks of participating?

Participants will benefit from being informed about their health and fitness levels and could also take advantage of training program to improve their physical fitness and health. There are no direct risks to participants taking part in this study.

Where is the study run from?
University of Moncton (Canada)

When is the study starting and how long is it expected to run for?
January 2014 to June 2014

Who is funding the study?
University of Moncton (Canada)

Who is the main contact?
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Contact information

Type(s)
Scientific

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Additional identifiers

Protocol serial number
N/A

Study information

Scientific Title
Effect of supramaximal exercise training on performance variables and metabolic changes in obese adults

Study objectives
The aim of this study is to evaluate the effects of six weeks of supramaximal exercise training (SET) and determine its effects on blood glucose control and insulin resistance, BMI and fitness.

Ethics approval required
Old ethics approval format

Ethics approval(s)

Study design

Single-center randomised controlled trial

Primary study design

Interventional

Study type(s)

Treatment

Health condition(s) or problem(s) studied

Obesity

Interventions

At the start of the study, participants undergo two sessions of preliminary testing after an overnight fast to determine anthropometric measurements, physiological measures (lung capacity and blood pressure) and metabolic testing.

Once the participants completed preliminary testing, they complete a total of 18 training sessions (three sessions per week for six weeks). Each of the prescribed sessions begins with a 5-minute warm-up of continuous cycling at moderate intensity (40% of their individual VO_{2peak} power) followed by 6 repetitions of SET intervals with 2 minutes of passive recovery between each repetition. Each SET repetition lasts for six seconds, and the participants are asked to pedal at maximal velocity against the resistance determined during day three. The total duration of each session is approximately 15 minutes. The training sessions are conducted under the supervision of a member of the research team, and velocities (in RPM) were recorded for each second of the bout to ensure that fixed velocities remained constant.

Post-intervention metabolic and blood pressure measurements are conducted 24-hours, 72-hours and two-weeks after the final training session to obtain information on the potential lasting effects of SET. The post-intervention anthropometric assessment is performed 24 hours after the final SET session, and the post-intervention exercise tests are performed 72 hours after the final SET session.

Intervention Type

Other

Primary outcome(s)

Insulin resistance (HOMA-IR) is determined by measuring blood glucose and insulin concentrations at baseline, 24 hours, 72 hours and 2 weeks post-intervention.

Key secondary outcome(s)

1. BMI is calculated as the ratio of mass (kg) to height squared (m^2) at baseline and 24 hours post-intervention
2. Maximal oxygen consumption (VO_{2max}) is measured using an incremental maximal test at baseline and 72 hours post-intervention
3. Maximal power is measured using a force-velocity test on a cycle ergometer at baseline and 72

hours post-intervention

4. Blood pressure is measured using an automated blood pressure monitor at baseline, 72 hours and 2 weeks post-intervention

Completion date

01/06/2014

Eligibility

Key inclusion criteria

1. Aged between 18 and 30 years
2. Obesity (BMI >30 kg/m²)
3. Sedentary (<1 h/week of structured exercise)

Participant type(s)

Healthy volunteer

Healthy volunteers allowed

No

Age group

Adult

Lower age limit

18 years

Sex

All

Total final enrolment

24

Key exclusion criteria

History of cardiovascular or chronic health problems, drug consumption, or smoking.

Date of first enrolment

01/02/2014

Date of final enrolment

25/02/2014

Locations

Countries of recruitment

Canada

Study participating centre

University of Moncton
School of Kinesiology and Leisure
Faculty of Health Sciences and Community Services
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Sponsor information

Organisation

University of Moncton (Université de Moncton)

ROR

<https://ror.org/029tnqt29>

Funder(s)

Funder type

University/education

Funder Name

University of Moncton (Université de Moncton)

Results and Publications

Individual participant data (IPD) sharing plan

IPD sharing plan summary

Available on request

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Results article	results	28/09/2017	30/11/2020	Yes	No
Participant information sheet	Participant information sheet	11/11/2025	11/11/2025	No	Yes