

Short- term effects of a single bout of moderate physical activity on liver fat content and validation of ultrasonography method after exercise

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In this study we will examine the short-term effects of a single bout of physical activity on liver fat content. Research question: What are the short- term effects of a single bout of moderate physical activity on liver fat content? Can the...

Ethical review	Approved WMO
Status	Recruitment stopped
Health condition type	Hepatic and hepatobiliary disorders
Study type	Interventional

Summary

ID

NL-OMON34197

Source

ToetsingOnline

Brief title

Short- term effects of exercise on liver fat content

Condition

- Hepatic and hepatobiliary disorders
- Lipid metabolism disorders

Synonym

fatty liver, NAFLD

Research involving

Human

Sponsors and support

Primary sponsor: Universitair Medisch Centrum Groningen

Source(s) of monetary or material Support: Ministerie van OC&W

Intervention

Keyword: Exercise, liver fat, NAFLD, validation ultrasound

Outcome measures

Primary outcome

Liver fat content - Visceral and subcutaneous fat content - Liver enzymes, lipid profile

Secondary outcome

Body weight, waist circumference, hip circumference - BMI - VO2 max

Study description

Background summary

Non alcoholic fatty liver disease (NAFLD) represents a spectrum of liver diseases, including steatosis, non-alcoholic steatohepatitis (NASH) and cirrhosis . The accumulation of lipids in the liver causes: insulin resistance, overproduction of glucose and Very Low Density Lipoprotein (VLDL), resulting in hyperglycemia, hypertriglyceridemia and low levels of HDL cholesterol. According to the American Association for the Study of Liver Disease, NAFLD is defined as: liver fat exceeding 5 to 10% of total liver weight. NAFLD seems to be related to obesity, one third of the patients with NAFLD is obese {Colles, 2006 7 /id}. There is increasing evidence that NAFLD is the new component of the metabolic syndrome. This clustering of risk factors is associated with an increased risk of cardiovascular disease and type 2 Diabetes Mellitus. The most appropriate treatment for hepatic steatosis is still uncertain. Most research intervention studies focus on weight reduction strategies to manage NAFLD. A combined study of restricted diet and exercise in obese patients with fatty liver, had beneficial effects, the degree of steatosis were significantly decreased. It is still unclear if exercise independent of weight loss influences liver fat content and what the short-term effects are.

Study objective

In this study we will examine the short-term effects of a single bout of physical activity on liver fat content. Research question: What are the short-term effects of a single bout of moderate physical activity on liver fat content? Can the ultrasonography method to quantify liver fat, be used after exercise? And what is the validity? Can a decrease in liver fat values be explained by volume overload of the liver?

Study design

Selection of Volunteers: In the pilot trial we will study 16 obese volunteers.

- Pretests • VO2 max test: One week before the intervention cardio respiratory fitness will be assessed with a maximal exercise tolerance test on an electrically braked bicycle ergometer. Food diary need to be kept 3 days before intervention. • Anthropometry: Body weight, waist circumference, hip circumference • Blood sampling: we will measure the following markers: Glucose, ALT, AST, LDL cholesterol, HDL cholesterol, triacylglycerol, acetoacetaat, beta hydroxybutaat, lactaat, pyrovaat and glyceriden • Ultrasonography will be used to determine : fat content, visceral and subcutaneous fat Echo 1 (pre-intervention) MRI 1 to validate liver fat values. • Intervention Bicycle ergometry. The volunteers need to complete 60 minutes of bicycle ergometry at 55% of their predetermined Vo2 max, RER values will also be used to control the intensity. • Bloodsampling - Post tests Echo 2 (immediatly after exercise) MRI 2 • Echo 3 MRI 3 • Echo 4

Intervention

Intervention Bicycle ergometry The volunteers need to complete 60 minutes of bicycle ergometry at 55% of their predetermined Vo2 max, RER values will also be used to control the intensity

Study burden and risks

Ultrasonography is non-invasive technique, used in the UMCG every day for many times. - MRI is considered to be a save research technique. - Blood samples will be taken by educated and experienced employees of the Clinical laboratory of the UMCG. - The VO2max test and intervention will be performed under the supervision of a medical doctor of the department of sports-medicine. In case of any abnormalities the intervention will be stopped. Here fore, we consider the risks of the study to be small.

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

BMI 28- 35 Waist circumference ≥ 88 cm (women), ≥ 102 cm (men)

Exclusion criteria

unstable glycaemic control Thiazolidinediones as hypoglycaemic drug excessive alcohol consumption >2 units or more for men per day and 1 units or more for women per day medication, known to cause steatosis: amiodarone, perhexiline, and DH known liver disease cardiac β -blockers advanced pulmonary or cardiovascular disease orthopedic limitations standard contraindications to exercise testing metallic implants (joint replacement, artificial heart valve, clips) cardiac pacemaker any implanted device (e.g. insulin pump, drug infusion device) claustrophobic

Study design

Design

Study type: Interventional

Masking: Open (masking not used)

Control: Uncontrolled

Primary purpose: Treatment

Recruitment

NL

Recruitment status: Recruitment stopped

Start date (anticipated): 01-08-2010

Enrollment: 16

Type: Actual

Ethics review

Approved WMO

Date: 14-07-2010

Application type: First submission

Review commission: METC Universitair Medisch Centrum Groningen (Groningen)

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

CCMO

ID

NL32466.042.10