Oral hydroxycitric acid (HCA) supplementation enhances glycogen synthesis in exercised human skeletal 1 muscle

Submission date	Recruitment status	Prospectively registered
20/12/2010	No longer recruiting	[_] Protocol
Registration date	Overall study status	[] Statistical analysis plan
21/01/2011	Completed	[_] Results
Last Edited	Condition category	Individual participant data
21/01/2011	Nutritional, Metabolic, Endocrine	[_] Record updated in last year

Plain English summary of protocol

Not provided at time of registration

Contact information

Type(s) Scientific

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Additional identifiers

EudraCT/CTIS number

IRAS number

ClinicalTrials.gov number

Secondary identifying numbers IRB951222

Study information

Scientific Title

Oral hydroxycitric acid (HCA) supplementation enhances glycogen synthesis in exercised human skeletal 1 muscle: a randomised placebo-controlled cross-over trial

Acronym HCA, GLUT4,FAT/CD36

Study objectives

In this study, we tested the hypothesis that oral hydroxycitric acid (HCA) supplementation might increase muscle glycogen stores and increase insulin sensitivity after exercise in humans, based on the evidence from mice studies.

Ethics approval required Old ethics approval format

Ethics approval(s)

National Taiwan Sport University Ethics Committee approved on the 12th December 2006

Study design Randomised placebo controlled crossover trial

Primary study design Interventional

Secondary study design Randomised controlled trial

Study setting(s) Hospital

Study type(s) Treatment

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

Glycogen synthesis in human skeletal muscle

Interventions

Since we aimed to determine the HCA effect on recovery, HCA and placebo meals were provided to the subjects immediately after exercise. HCA trial provided a meal containing 70% carbohydrate content with 500 mg HCA in half litre of drinking water for a 3-hour recovery, whereas the placebo trial (placebo, eight comparisons) provided a diet containing 70% carbohydrate content plus same volume of drinking water. In particular, carbohydrate meal contained 2 g carbohydrate per kilogram of body weight. The decision for HCA dosage was based on previous human report which demonstrated positive ergogenic effect on endurance performance. Subjects performed a 60-mins cycling at 75% VO2max. Muscle biopsy samples, blood samples and gaseous samples were obtained immediately after exercise and during 3 hours after exercise.

Intervention Type

Drug

Phase Not Applicable

Drug/device/biological/vaccine name(s)

Hydroxycitric acid

Primary outcome measure

Glycogen assay. Approximately 25 mg of skeletal muscle from the deep portion of the vastus lateralis was dissolved in 1 N KOH at 75°C for 30 minutes. Dissolved homogenate was neutralised by glacial acetic acid and incubated overnight in acetate buffer (0.3 M sodium acetate, pH to 4.8) containing amyloglucosidase (Boehringer Mannheim, Indianapolis, IN). The reaction mixture was neutralised with 1 N NaOH. Samples were then analysed by measuring glucosyl units by the Trinder reaction (Sigma, St. Louis, MO).

Secondary outcome measures

Molecular expressions of GLUT4, FAT/CD36, measured with reverse transcription-polymerase chain reaction (RT-PCR) and western blotting

Overall study start date

01/08/2006

Completion date

30/04/2007

Eligibility

Key inclusion criteria

1. Healthy male volunteers

- 2. Aged 22.0 +/- 0.3 years
- 3. Height 171.3 +/- 0.7 cm

4. Weight 73.7 +/- 1.1 kg

- 5. Body mass index (BMI) 25.2 +/- 0.5 kg/m2
- 6. Ventilatory equivalent for oxygen (VEO2) 108
- 7. Peak 45.7 +/- 1.5 ml/kg/min

Participant type(s) Patient

Age group

Adult

Sex

Male

Target number of participants n = 8

Key exclusion criteria Male volunteer's VO2max less than 30 ml/kg/min

Date of first enrolment 01/08/2006

Date of final enrolment 30/04/2007

Locations

Countries of recruitment Taiwan

Study participating centre 140, Ming Sheng Road Taichung City Taiwan 403

Sponsor information

Organisation National Science Council (Taiwan)

Sponsor details 106, Ho-Pei East Road Taipei City Taiwan 10622

Sponsor type Government

Website http://web1.nsc.gov.tw

ROR https://ror.org/02kv4zf79

Funder(s)

Funder type Government

Funder Name National Science Council (Taiwan) (ref: NSC 97-2140-H-166-007-MY2)

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