Mitochondrial Coupling Efficiency, Respiration and Vitamin B2 status in Untrained and Endurance-trained Young Females

No registrations found.

Ethical review	Not applicable
Status	Recruitment stopped
Health condition type	-
Study type	Observational non invasive

Summary

ID

NL-OMON24874

Source NTR

Brief title B-MCORE

Health condition

Metabolism, vitamin B2 status

Sponsors and support

Primary sponsor: Wageningen University & Research **Source(s) of monetary or material Support:** Wageningen University & Research

Intervention

Outcome measures

Primary outcome

The primary outcome is to study mitochondrial function in PBMCs from endurance-trained

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and untrained young females and link it to vitamin B2 status.

Secondary outcome

• To compare basal and exercise-stimulated mitochondrial function in PBMCs to analyse how exercise impacts mitochondrial function and whether this differs between endurance-trained and untrained young females;

• To analyse vitamin B2 status in cells, 24-hour urine and plasma in basal and exercisestimulated endurance-trained and untrained young females to understand how exercise impacts vitamin B2 status and whether this differs between endurance-trained and untrained females;

• To characterize muscle mitochondrial capacity in endurance-trained and untrained young females using NIRS measurements to study the association between vitamin B2 status and muscle mitochondrial function;

• To investigate the mechanistic link between mitochondrial function in PBMCs and vitamin B2 status by analysing markers of mitochondrial and metabolic health in plasma, cells and 24-hour urine.

Study description

Background summary

Extensive endurance training puts a high energy demand on the human body. Macronutrient as well as micronutrient requirements should be met to support the generation of energy. Mitochondria generate energy by the oxidation of macromolecules, and vitamins and minerals are essential to support mitochondria during substrate oxidation. Although all Bvitamins are involved in mitochondrial function, vitamin B2 is of particular interest as it is directly involved in energy generation and ROS production. In addition, human trials have indicated that exercise is negatively associated with vitamin B2 status. We aim to investigate the role of vitamin B2 in endurance-trained individuals and its role in supporting mitochondrial function.

Study objective

Exercise is associated with lower vitamin B2 status

Study design

N/A

Intervention

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Contacts

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Eligibility criteria

Inclusion criteria

- 18-28 year old female
- BMI 18.5-25 kg/m2
- VO2max \leq 37 mL/kg/min or VO2max \geq 47 mL/kg/min;

- Performed a valid VO2max test In order for the test to be considered valid two out of three of the following conditions should be met:

- 1) The maximal heart rate is within 10 beats of the predicted maximum (220 age)
- 2) A plateau in in VO2 was reached; VO2 fails to increase with 150 mL/min, despite an increase in work load

3) Respiratory exchange ratio (RER) \geq 1.00 has been achieved

Exclusion criteria

• Health concerns regarding respiratory and pulmonary diseases, for example COPD or (exercise induced) asthma

• (Known symptoms of) chronic diseases, for example cardiovascular disease and cancer;

• (Known symptoms of) metabolic diseases, for example type I or II diabetes or hyperthyroidism;

• (Known symptoms of) inborn metabolic diseases, for example glucose-6-phosphate dehydrogenase (G6PD) deficiency;

• (Known symptoms of) hematological disorders, for example anemia or disturbed red blood cell formation;

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- Haemoglobin concentrations below 7.5 mmol/L;
- Regular smoker (defined as smoking >5 cigarettes per week);
- Lactating or pregnant;

• Following a veganistic lifestyle, i.e. excluding the consumption of animal or animal-derived food products. Vegetarians are allowed to participate in the study.

• Usage of hormonal contraceptive medications other than the birth control pill Microgynon 20/30 or a generic variant containing 0.02/0.03 mg ethinylestradiol and 0.10/0.15 mg levonorgestel. Examples include IUD contraceptives or contraceptive rings. The use of condoms or pessaria is allowed;

• Recent use (within four months) of supplements with suggestive training effects, for example creatine phosphate, EPO or anabolic steroid;

• Recent daily usage (within four weeks) of supplements containing vitamin B2 (including multivitamin supplements) and usage of vitamin B2 supplements during the study;

• Usage of recreational drugs, for example marihuana, amphetamines and cocaine during the study (starting after first screening day);

• Suffers from (sport) injury that hampers maximal exercise performance;

- Blood donation during the previous 2 months or during the course of study;
- Current participation in other clinical trials;
- Not subscribed to a general practitioner (GP) practice;

• Employed or undertaking a thesis or internship at the department of Human and Animal Physiology.

Study design

Design

Study type:	Observational non invasive
Intervention model:	Parallel
Allocation:	Non controlled trial
Masking:	Open (masking not used)
Control:	N/A , unknown

Recruitment

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Recruitment status:	Recruitment stopped
Start date (anticipated):	01-09-2019
Enrollment:	32
Туре:	Actual

IPD sharing statement

Plan to share IPD: Undecided

Ethics review

Not applicable Application type:

Not applicable

Study registrations

Followed up by the following (possibly more current) registration

ID: 48355 Bron: ToetsingOnline Titel:

Other (possibly less up-to-date) registrations in this register

No registrations found.

In other registers

Register	ID
NTR-new	NL7891
ССМО	NL70136.081.19
OMON	NL-OMON48355

Study results