Acute Effect of Beta-Guanidinopropionic Acid and Creatine in Healthy Men; a Randomized, Placebo-Controlled, Double-Blind, Double-Dummy Study.

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In this study, we will assess the tolerability of GPA in healthy male volunteersFurthermore, we will assess the effect of GPA and creatine on hemodynamic, biochemical parameters and ADP-dependent plateletaggregation of healthy male volunteers.

Ethical review	Approved WMO
Status	Recruitment stopped
Health condition type	Other condition
Study type	Interventional

Summary

ID

NL-OMON39788

Source
ToetsingOnline

Brief title
Acute effect of beta-guanidinopropionic acid and creatine

Condition

- Other condition

Synonym
not applicable

Health condition

het onderzoek is niet van toepassing op een klasse van aandoening(en), maar op fysiologische veranderingen gelijkend op het effect van duurtraining.

Research involving
Human

Sponsors and support

Primary sponsor: Academisch Medisch Centrum
Source(s) of monetary or material Support: Ministerie van OC&W

Intervention

Keyword: beta-guanidinopropionic acid, biochemical parameters, creatine, hemodynamics

Outcome measures

Primary outcome

Tolerability of GPA

Secondary outcome

The difference in hemodynamic parameters with GPA 100 mg vs placebo and creatine 5 g, including blood pressure, heart rate, cardiac output, and total peripheral resistance.

The difference in biochemical parameters with GPA 100 mg vs placebo and creatine 5 g, including serum GPA, creatine, creatine kinase, glucose, insuline, and creatinine, and urine GPA, creatine and creatinine.

The difference in ADP-dependent plateletaggregation and thrombocyt count.

Study description

Background summary

Beta-guanidinopropionzuur (GPA) is a creatine analogue and competitive inhibitor of the cellular creatine uptake. The substance is freely available on

the internet and used by sportsmen to increase endurance capacity, promote weight loss, and improve glucose tolerance.

Animal studies showed that GPA induced an increase in type I oxidative fibers, with a concomittant increase in oxidative enzyme activity and a decrease in glycolytic enzyme activity. Endurance training has a similar effect. Our new data indicate a potential blood pressure lowering effect of GPA in hypertensive animals.

However, to our knowledge, there are no published data on the effect of GPA on hemodynamic and biochemical parameters in humans.

Although many studies assessed the effect of creatine on muscle perfomance, none of those studies reported the effect on hemodynamic parameters. As described above for the influence of GPA on the energy status, GPA might also affect local ADP/ATP ratio*s by inhibiting of the reaction: ADP + creatine phosphate (CrP) * ATP + creatine. In a pilot study we found a dose dependent reduction of platelet aggregation by creatine kinase at activity levels from 500 to 4000 IU/L, as found in the general population. The effect of GPA on this mechanism has not yet been studied before.

Study objective

In this study, we will assess the tolerability of GPA in healthy male volunteers Furthermore, we will assess the effect of GPA and creatine on hemodynamic, biochemical parameters and ADP-dependent plateletaggregation of healthy male volunteers.

Study design

100 mg GPA, creatine 5 g, or placebo during one week

Intervention

GPA 100mg versus creatine 5 g and placebo

Study burden and risks

The participants have to be available for 5 days during 1 week. The first visit (day 0), they will need to fill out a questionnaire, will be physically examined including blood pressure and EKG, and blood draw. In addition, a ambulant 24-hour blood pressure measurement will be performed, and the participant will be asked to collect 24-hour urine. Dependent on the results the participant will return for the second visit (day 1). During this visit, after blood pressure measurement, the participant will recieve a capsule with GPA 100 mg, or creatine 5 g, and placebo. As the doses of GPA and creatine are

not equivalent, we use a "double-dummy" protocol. The participant is asked to take the following capsules daily in the morning during 7 days:
1 capsule 100 mg GPA or placebo.
10 capsules creatine 500 mg or 10 capsules placebo 500 mg.
Thus, each participant takes 11 capsules daily during 7 days. During the second visit, a ambulant 24-hour blood pressure measurement will be performed and the participant will be asked to collect 24-hour urine.

On the third visit (day 3) he will visit the hospital for blood pressure measurements, blood draw and an ECG. On day 7 and 8, similar investigations will be performed as on day 1 and 2. Furthermore, the participant is asked to archivate physical complaints with use of questionnaire. After 3 weeks there will be a final visit.

GPA is freely available on the internet. The participants will receive low doses of GPA that we calculated according to the FDA guidelines for estimation of a safe starting dose in humans. In these guidelines safe doses in animals are coverted to human equivalent doses. We calculated a safe starting dose of 1200mg. We will use lower doses of 100 and 500mg. Furthermore, there are no FDA or other reports in formal or informal sources such as google on the side effects of ingestion of a low dose βGPA in animals or humans. The described effects were completely reversible. Thus, we don't expect side effects of GPA. Creatine 5 g is a frequently used dose. No side effects are described with this dose.

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

Healthy male volunteers, 18-50 years old, non-obese body mass (BMI 18.5-29.9 kg/m2)

Exclusion criteria

BMI>/= 30 kg/m2, diabetes mellitus, lipid spectrum abnormalities, thyroid, kidney, or liver abnormalities, (history of) cardiovascular disease including TIA and stroke; high blood pressure or the use of antihypertensive drugs at baseline; CK-increasing drugs including statins; use of acetylsalicyl acid or non-steroidal anti-inflammatory drugs (NSAIDs) in the two week prior to the visits; neuromuscular or endocrine disorders; vasculitis; HIV infection; infectious hepatitis; personal or family history of bleeding disorders; sickle cell anaemia or other hereditary anaemia; smoking; vegetarian diet; current urse or use within 2 months prior to start of the trial of beta-guanidinopropionic acid or creatine. The participants are instructed not to perform exercise thee days prior to the basline visit and during the study

Study design

Design

Study type:	Interventional
Intervention model:	Parallel
Allocation:	Randomized controlled trial
Masking:	Double blinded (masking used)
Control:	Placebo
Primary purpose:	Treatment

Recruitment

NL

Recruitment status:	Recruitment stopped
Start date (anticipated):	27-03-2014
Enrollment:	24
Type:	Actual

Ethics review

Approved WMO Date:	25-11-2013
Application type:	First submission
Review commission:	METC Amsterdam UMC
Approved WMO Date:	27-03-2014
Application type:	Amendment
Review commission:	METC Amsterdam UMC
Approved WMO Date:	21-08-2014
Application type:	Amendment
Review commission:	METC Amsterdam UMC

Study registrations

Followed up by the following (possibly more current) registration

No registrations found.

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

ID: 26749
Source: Nationaal Trial Register
Title:

In other registers

Register	ID
CCMO	NL38368.018.12
OMON	NL-OMON26749