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Exploring the effects of L-carnitine supplementation on CrossFit® performance

Submission date
07/10/2024

Recruitment status
No longer recruiting

Registration date
29/01/2025

Overall study status
Completed

Last Edited
28/02/2025

Condition category
Other

[ ] Prospectively registered
[ ] Protocol
[ ] Statistical analysis plan
[ ] Results
[ ] Individual participant data
[ ] Record updated in last year

Plain English summary of protocol

Background and study aims
This study aims to investigate whether L-carnitine supplementation can improve performance in recreational CrossFit® athletes during a high-intensity workout called "Cindy." Specifically, whether taking L-carnitine will increase the number of repetitions completed during the workout and its effects on perceived exertion, blood pressure, and any potential side effects like gastrointestinal discomfort.

Who can participate?
The study includes adult male volunteers between the ages of 18 and 35 years old who had at least six months of CrossFit® experience and had previously completed the "Cindy" workout

What did the study involve?
Participants will be randomly assigned to take either a 3 g dose of L-carnitine or a placebo 90 minutes before performing the "Cindy" workout. Each participant takes part in two separate sessions: one with L-carnitine and one with a placebo. During the workout, the total number of repetitions, ratings of perceived exertion (RPE), blood pressure and any side effects, such as gastrointestinal issues, are recorded.

What were the possible benefits and risks of participating?
While participants will not experience direct benefits from the study, the findings provide valuable information about the effects of L-carnitine on high-intensity exercise performance. There are minimal risks involved, such as reporting minor gastrointestinal discomfort and difficulty sleeping after taking L-carnitine, but no serious adverse effects are expected to be observed.

Where was the study run from?
The study was conducted at a CrossFit® club within the Faculty of Higher Studies of Zaragoza.

When did the study start and how long did it run for?
January 2023 to December 2023

Who funded the study?
Universidad Nacional Autónoma de México

Who was the main contact?
Dr Azucena Ojeda Sanchez, a.ojeda@zaragoza.unam.mx, azucenaojedasan@yahoo.com.mx

Contact information

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Additional identifiers

Protocol serial number
CARCT1

Study information

Scientific Title
The effects of acute L-carnitine supplementation on CrossFit® performance: a randomized, double-blind, placebo-controlled crossover study

Study objectives
Primary Hypothesis: Acute L-carnitine supplementation will enhance exercise performance, as measured by the total number of repetitions completed by recreational CrossFit® athletes, compared to a placebo.

Secondary Hypothesis: L-carnitine supplementation will result in lower ratings of perceived exertion (RPE) and more favorable blood pressure (BP) measurements during exercise compared to a placebo.

Ethics approval required
Ethics approval required

Ethics approval(s)
approved 27/11/2023, The Research Ethics Committee of National Autonomous University of Mexico (Av. Universidad 3004, Copilco Universidad, Coyoacán, Mexico City, 04510, Mexico; +52 55 5622 0000; etica.enlace@zaragoza.unam.mx), ref: FESZ/CEI/31/23

Study design
Randomized double-blind placebo-controlled crossover study

Primary study design
Interventional

Study type(s)
Efficacy

Health condition(s) or problem(s) studied
The acute effects of L-carnitine supplementation on exercise performance in recreational CrossFit® practitioners

Interventions
In this randomized, double-blind, placebo-controlled crossover study, a free online randomisation tool (randomiser.org) was used to assign CrossFit practitioners to groups. They participated in two workout sessions in a crossover design, with no additional follow-up activities afterwards. Participants were assigned to receive either a 3 mg dose of L-carnitine tartrate or a placebo. The L-carnitine tartrate dose was administered 90 minutes before the “Cindy” workout, a CrossFit® exercise regimen. Participants completed both the L-carnitine and placebo conditions in separate sessions, with the order of administration randomized to minimize bias. The total number of repetitions completed during the workout was recorded to assess exercise performance. In addition, ratings of perceived exertion (RPE) and blood pressure (BP) measurements were collected during each session. The percent change in performance between sessions was calculated to evaluate any potential learning effect on the ergogenic benefits of L-carnitine supplementation.

Intervention Type
Supplement

Primary outcome(s)
Exercise performance was measured using the total number of repetitions completed during the "Cindy" workout, a high-intensity CrossFit® protocol immediately after the workout in each session

Key secondary outcome(s))
1. Ratings of Perceived Exertion (RPE) were measured using a standard Borg scale at the end of the workout
2. Blood Pressure (BP) was measured using a standard sphygmomanometer before and after the workout session
3. Gastrointestinal issues were measured using participant self-reporting at the end of the workout

Completion date
31/12/2023

Eligibility

Key inclusion criteria
1. Trained adult males aged 18-35 years old
2. A minimum of six months of CrossFit® experience
3. Required to have previously completed the “Cindy” workout routine

Participant type(s)
Healthy volunteer

Healthy volunteers allowed
No

Age group
Adult

Lower age limit

18 years

Upper age limit
35 years

Sex
Male

Total final enrolment
20

Key exclusion criteria
1. Diagnosed illnesses
2. Smoking
3. Recent use of medications or supplements (within the last three months)
4. Family history of seizures
5. Musculoskeletal injuries

Date of first enrolment
27/11/2023

Date of final enrolment
27/12/2023

Locations

Countries of recruitment
Mexico

Study participating centre
Faculty of Higher Studies of Zaragoza
Avenida Guelato 66
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Sponsor information

Organisation
Universidad Nacional Autónoma de México

ROR
https://ror.org/01tmp8f25

Funder(s)

Funder type
University/education

Funder Name
Universidad Nacional Autónoma de México

Alternative Name(s)
National Autonomous University of Mexico, National Autonomous University, Universidad Nacional Autónoma, National University of Mexico, UNAM

Funding Body Type
Government organisation

Funding Body Subtype
Universities (academic only)

Location
Mexico

Results and Publications

Individual participant data (IPD) sharing plan
The datasets generated during and/or analyzed during the current study will be available upon request from Beat Knechtle, beat.knechtle@hispeed.ch. The data includes individual participant data (IPD) related to performance outcomes, ratings of perceived exertion (RPE), blood pressure measurements, and any reported side effects. The data will be anonymized to protect participant confidentiality and will be shared with researchers upon request for the purpose of replicating or extending the findings of the study. Access will be granted to individuals or institutions involved in academic or scientific research, subject to approval by the study's ethics committee. Consent for data sharing was obtained from participants as part of the informed consent process.

IPD sharing plan summary
Available on request

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Participant information sheet			21/10/2024	No	Yes