

Home

Mission

Scope

Editorial Board

For Reviewers

Submission

Statistics

Contact

Back Issues



©Journal of Sports Science and Medicine (2002) 01, 87 - 95

Research article

Creatine Supplementation Induces Alteration in Cross-Sectional Area in Skeletal Muscle Fibers of Rats Under Swimming Training

Irlena M. W. Moura¹, Fernando Farias Dos Santos¹, José A. A. Moura¹, Rui Curi², Luiz C. Fernandes¹.

✉ [More Information >](#)

¹ Departamento de Fisiologia, Setor de Ciências Biológicas, Universidade Federal do Paraná, Curitiba, Paraná - Brasil

² Departamento de Fisiologia e Biofísica, Instituto de Ciências Biomédicas, Universidade de São Paulo, São Paulo - Brasil

Irlena M. W. Moura
 ✉ Universidade Federal do Paraná, Setor de Ciências Biológicas. Departamento de Fisiologia, Centro Politécnico, 81531-971, Curitiba-Paraná-Brasil
 Email: afonsomoura@uol.com.br

Received: 17-04-2002 -- Accepted: 06-08-2002 -- Published (online): 01-09-2002

ABSTRACT

Creatine has been shown to increase the total muscle mass. In this study, we investigated the effect of oral creatine monohydrate supplementation on cross-sectional area of type I, IIA and IIB fibers of gastrocnemius, extensor digitorum longus - EDL and soleus muscles from male Wistar rats subjected to swimming training for 33 days. Four groups were set up: sedentary with no supplementation (CON), sedentary with creatine supplementation (3.3 mg creatine per g chow) (CR), exercised with no supplementation (EX) and exercised with supplementation (CREX). The rats performed in a special swimming pool and swam five times a week for 1 hour each day, with an extra lead weight corresponding to 15% of their body weight. At the end of 33 days, skeletal muscles of the animals were dissected and the samples got immediately frozen using liquid nitrogen. Muscle samples were allocated to slices of 10 µm by a cryostat at -20° C, which was followed by histochemical analysis in order to identify fiber types of the muscles, and morphometrical analysis to calculate the muscle fiber areas. All groups gained body weight at the end of 33 days but there was no statistical difference among them. The EX and CREX rats had a larger food intake than the sedentary groups (CON and CR), and the CREX group had a larger food intake than CR rats. The cross-sectional area of type I and IIA fibers of the soleus muscle, type IIA and IIB fibers of EDL muscle and type IIA and IIB fibers of the white portion of gastrocnemius muscle were greater in the EX and CREX groups in comparison to sedentary rats. In addition, these fibers were greater in the CREX rats than in the EX group. There was no change in the cross sectional area of type I fibers in EDL muscle among all groups studied. Our results suggest that creatine supplementation enhances the exercise related muscle fiber hypertrophy in rodents.

Key words: Creatine, skeletal muscle fiber, exercise, morphometry, histochemistry

Key Points

Article Tools

- PDF Download
- Full Text
- How to Cite
- Citations in ScholarGoogle
- Email link to this article

Irlena M. W. Moura,
 Fernando Farias Dos Santos, José A. A. Moura, Rui Curi, Luiz C. Fernandes, (2002)
 Creatine Supplementation Induces Alteration in Cross-Sectional Area in Skeletal Muscle Fibers of Rats Under Swimming Training.
Journal of Sports Science and Medicine (01), 87 - 95.

Your name:
 Your E-mail:
 Recipient's E-mail:



Tweet

Related articles by
[Creatine](#)
[skeletal muscle fiber](#)
[exercise](#)
[morphometry](#)
[histochemistry](#)

Other articles by
[Irlena M. W. Moura](#)
[Fernando Farias Dos Santos](#)
[José A. A. Moura](#)
[Rui Curi](#)
[Luiz C. Fernandes](#)

