

P55- Effects of exhaustive exercise on expression of RCAN1 isoforms in rat muscles: involvement of oxidative stress.

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The objective of this study is to determine if exhaustive exercise could regulate the expression of RCAN1 isoforms through oxidative stress-dependent mechanisms. RCAN1 expression is evaluated in rat muscles (gastrocnemus, soleus, EDL). Our results suggest that exhaustive exercise induces a down-regulation of RCAN1-1 which seems dependent of oxidative stress.

Keywords : RCAN, oxidative stress, exhaustive exercise, muscles

INTRODUCTION:

The *RCAN1* gene (also called *Adapt78* or *DSCR1*) generates a series of RCAN1 protein isoforms including RCAN1-4, RCAN1-1L, and RCAN1-1S whose expression is regulated by oxidative stress and calcium. RCAN1 proteins are natural cellular regulators of calcineurin, a Ca²⁺ dependent protein phosphatase involved in several crucial physiological processes and pathological conditions such as skeletal myocyte differentiation, cardiac hypertrophy, Alzheimer's disease and cancer. Although exhaustive exercise is known to involve oxidative stress, very little is known about its effect(s) on RCAN1 protein expression or distribution patterns in muscle.

OBJECTIVES:

In this study, we analyzed the effects of exhaustive exercise, and the potential involvement of oxidative stress, on RCAN1 proteins in various rat muscles (gastrocnemius, soleus and EDL).

METHODS:

Wistar male rats were divided into two groups: control (C) and exercise (E). Animals were sacrificed at 0h, 1h, 2h, 6h and 24 hours after an exhaustive exercise on a treadmill. RCAN1-4, RCAN1-1S and RCAN1-1L expression were evaluated in muscles by Western blot analysis. F2-isoprostane concentrations were measured by LC-MS. Vitamin E contents were quantified by HPLC, and antioxidant capacities were estimated by spectrofluorimetry.

RESULTS:

We show that RCAN1-1S initially increased, then decreased 6 and 24 hours after exhaustive exercise. This reduction in RCAN1-1S levels might be dependent on oxidative stress given the concomitant changes in Vitamin E content in all muscles. Moreover, antioxidant defences seem to be decreased in EDL.

CONCLUSION:

These results suggest that exhaustive exercise regulates RCAN1-1S, possibly by an oxidative stress-dependent mechanism.

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