

Effect of aerobic exercise on blood glucose control in rats submitted to chronic stress.

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Abstract

Considering that exercise modulates insulin secretion and it is important to treat metabolic diseases, the aim of the study was to evaluate the influence of moderate aerobic exercise on blood glucose control in rats submitted to chronic stress.

Key words: Exercise, Stress, Physiological, Glycemic index.

Introduction

The chronic mild stress (CMS) can induce insulin resistance in rats. Exercise may increase glucose uptake by non insulin-dependent pathways. The aim of this study was to evaluate the effect of aerobic training on the glycemic control of rats submitted to CMS.

Results and Discussion

Aerobic training decreased the final body weight from Exercise and Stress + Exercise groups in comparison with Control and Stress groups ($p < 0.05$). Stress, Exercise and Stress + Exercise groups presented higher corticosterone plasma levels in comparison with Control group ($p < 0.05$). The CMS model is characterized, in rodents, for the lack of adaptation to repeated and unpredictable application of stressors⁽¹⁾. During the stress protocol occur adaptive responses in the organism with participation of emotional, neural, endocrine and immunological mechanisms⁽²⁾. In response to stress, there may be gain or weight loss⁽³⁾. Exposure to different stressors alternately induces sustained elevation of corticosterone levels in rodents⁽¹⁾. In the oral glucose tolerance test the groups submitted to stress (Stress and Stress + Exercise) presented higher blood glucose levels when compared to non-stressed groups (Control and Exercise) ($p < 0.05$). Physical training may improve the glucose tolerance and insulin resistance and this effect is due, at least in part, to that increase in glucose uptake by the muscle tissue⁽⁴⁾. However, depending on the way the exercise is applied, the physical training may act as a stressor, since it can stimulate the secretion of hyperglycemic hormones such as corticosterone, growth hormone (GH), glucagon, and catecholamines⁽⁵⁾.

Conclusions

Physical exercise decreased body weight gain of the animals, however did not change the loss in the control of blood glucose induced by CMS.

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