

EFFECTS OF AEROBIC PHYSICAL TRAINING ON THE ADIPOCYTOKINE CONCENTRATIONS IN MICE FED WITH HIGH-FAT DIET

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Abstract

Sedentary lifestyle and obesity are considered risk factors for the genesis of cardiovascular diseases. The aim of the present study was to investigate the effects of aerobic exercise training on the adipocytokine concentrations in serum and adipose tissue in mice fed with high-fat diet.

Key words:

aerobic physical training, adipokines, high-fat diet.

Introduction

The white adipose tissue is responsible for production and release of adipokines that are involved in a wide range of physiological processes. More recently, studies have shown that perivascular adipose tissue plays an important role in vascular function. The aim of the present study was to investigate the effects of aerobic exercise training on the adipocytokine concentrations in mice fed with high-fat diet.

Results and Discussion

Male C57BL6/JUnib mice (6-7 weeks) were divided into four experimental groups: sedentary control (c-SD), trained control (c-TR), sedentary high-fat diet (dh-SD) and trained high-fat diet (dh-TR). For sixteen weeks the c-SD and c-TR groups were fed with standard chow and the dh-SD and dh-TR groups were fed with high-fat diet. After eight weeks, only the c-TR and dh-TR groups initiated aerobic physical training on a treadmill, 5 days/week, 60 minutes per session (60-70% of maximum speed) and 0% grade until the end of the full protocol. Serum biochemical parameters were evaluated. Leptin and adiponectin concentrations were determined in epididymal fat pad and aortic perivascular adipose tissue. The animals from dh-SD group had a significantly increased in body weight, epididymal fat pad, aortic perivascular adipose tissue, glucose, total cholesterol, triglycerides, leptin, resistin and TNF- α as compared with c-SD group. Exercise training was effective to reduce TNF- α . The concentration of leptin in both epididymal fat pad and aortic perivascular adipose tissue was increased in the dh-SD and dh-TR groups as compared to c-SD and c-TR groups. No changes in the serum and tissue adiponectin were observed.

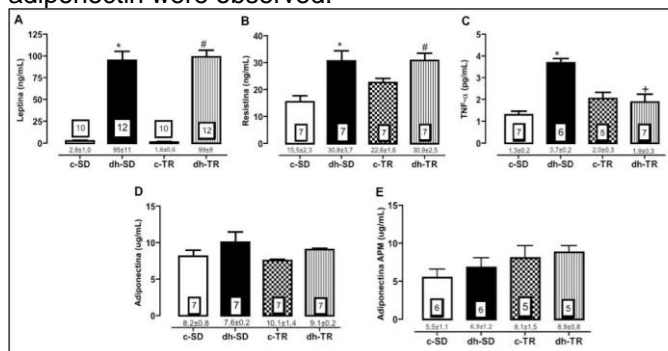


Image 1. Serum adipocytokine concentrations. * $p < 0,05$ compared with c-SD group; # $p < 0,05$ compared with c-TR group; + $p < 0,05$ compared with dh-SD group.

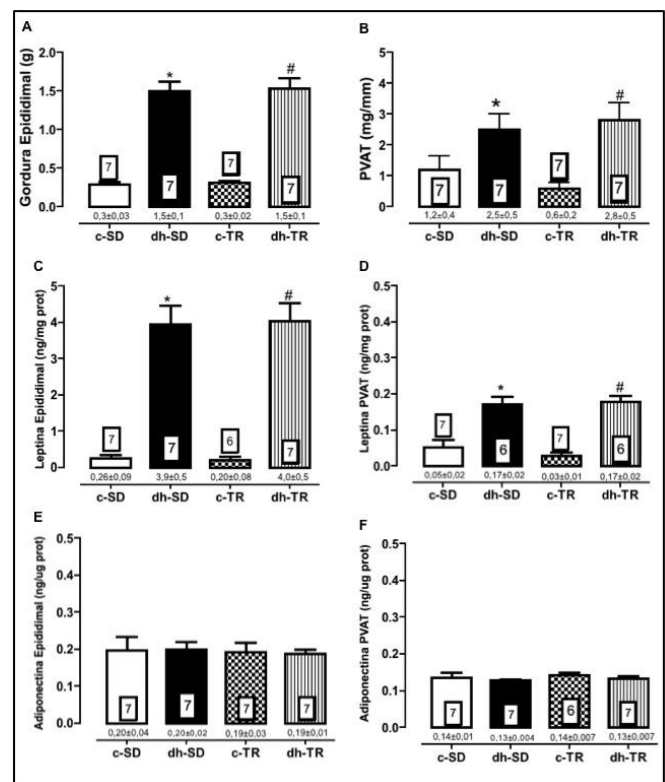


Image 2. Tissue adipocytokine concentrations. * $p < 0,05$ compared with c-SD group; # $p < 0,05$ compared with c-TR group.

Conclusions

As our results demonstrated, the moderate aerobic physical training was only effective to reduce the circulant levels of TNF- α , having no other effect on the adipokine concentrations neither on the serum and tissue in mice fed with high-fat diet. Considering obesity as a multifactorial disorder influenced by the interaction of factors involved in the appetite regulation, nutritional content and energy expenditure, we suggest that an intervention involving both aerobic physical training and control of food intake can present more efficient results in the regulation of the metabolic and inflammatory disorders in obesity.

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