



Benefits of Regular Exercise on Inflammatory and Cardiovascular Risk Markers in Normal Weight, Overweight and Obese Adults

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Editorial Note

Obesity is a worldwide epidemic that increases the risk of several well-known co-morbidities. There is a complicated relationship between adipokines and low-grade inflammation in obesity and cardiovascular disease (CVD). Physical activity practices have beneficial health effects on obesity and related disorders such as hypertension and dyslipidemia. We investigated the effects of 6 and 12 months of moderate physical training on the levels of adipokines and CVD markers in normal weight, overweight and obese volunteers. The 143 participants were followed up at baseline and after 6 and 12 months of moderate regular exercise, 2 times a week, for 12 months. The volunteers were distributed into 3 groups: Normal weight group (NWG), overweight group (OVG) and obese group (OBG). We evaluated blood pressure, resting heart rate, anthropometric parameters, body composition, fitness capacity (VO₂max and isometric back strength), cardiovascular markers (CRP, total cholesterol, LDL-c, HDL-c, homocysteine) and adipokine levels (leptin, adiponectin, resistin, IL-6 and TNF- α). There were no significant changes in anthropometric parameters and body composition in any of the groups following 6 and 12 months of exercise training. Leptin, IL-6 levels and systolic blood pressure were significantly elevated in OBG before the training. Regular exercise decreased HDL-c, leptin, adiponectin and resistin levels and diastolic blood pressure in OVG. In OBG, exercise diminished HDL-c, homocysteine, leptin, resistin, IL-6 and adiponectin. Moderate exercise had no effect on the body composition; however, exercise did promote beneficial effects on the low-grade inflammatory state and CVD clinical markers in overweight and obese individuals.

Obesity is a public health problem and can be classified as a world epidemic that leads to an elevation in medical costs. Obesity and overweight have been shown to increase the risk of several well-known co-morbidities such as cardiovascular disease. Obesity is characterized by excess energy intake resulting in an expansion of adipose tissue depots, visceral adiposity, hypertrophy, hyperplasia, and adipocyte dysfunction [1]. In obese individuals there are marked increases in the secretion of pro-inflammatory adipokines including leptin, resistin, IL-6 and TNF- α , and decreased production of anti-inflammatory adipokines such as adiponectin. This change in adipokine balance is a key component of pathogenic metabolic and immune responses and has impacts on angiogenesis, blood pressure and lipid metabolism, all of which are linked with cardiovascular disease

Anthropometry and body composition

Anthropometric measures including height, body mass, abdomen circumference, waist circumference (WC) and hip circumference (HC) were evaluated using standard techniques BMI, waist/hip ratio (WC/HC) and waist/height ratio (WC/height) were calculated. Then, body composition (percentage of total body fat, lean mass and fat mass) was assessed by bioimpedance analysis

Blood samples for biochemical and hormonal measurements were withdrawn after 8 h of fasting and 24 h after the last exercise session. Blood samples (20 ml, 10 ml EDTA tube and 10 ml dry tube) were taken from the antecubital vein before the training period, and six months and 12 months after the training began. Serum and plasma were separated by centrifugation for 10 min at 1000 \times g and were subsequently stored in aliquots at -80°C until further analysis.

A monoclonal antibody specific for each molecule has been pre-coated onto a microplate. After incubation with standards and samples and washing away any unbound substances, an enzyme-linked monoclonal antibody specific for each adipokine and homocysteine was added.

Following another wash, a substrate solution was added to the wells and color developed in proportion to the adipokines and homocysteine levels. The color development was stopped and the intensity of color was measured at 450 nm using a spectrophotometer

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