Research Letter

Effects of walk training with self-selected intensity on biochemical markers and anthropometric variables in women with obesity

A B S T R A C T

To evaluate the effects of 12-weeks of walk training with self-selected intensity on lipid profile and anthropometric variables in women with obesity. Forty-eight women volunteers with obesity were randomly assigned into two training groups: self-selected walking group (SSWG; n = 25) and control group (CG; n = 23). There was improvement in biochemical markers only in the SSWG post-intervention ($p < 0.05$), however no changes were verified in anthropometric variables ($p > 0.05$). This study demonstrates that walking at self-selected intensity improved the lipid profile in women with obesity.

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Introduction

Obesity is increasing worldwide, and is associated with several complications for health [1]. The practice of regular exercise helps in health promotion and in weight loss [2], but the global prevalence of insufficient physical activity is high (27.5%) with difference between sexes (men = 23.4% vs women = 31.7%) [3]. Therefore, some strategies such as self-selecting the effort intensity are interesting to increase the level of physical activity [4]. However, it is not clear whether the regular practice of walking at self-selected intensity might cause changes on lipid profile and anthropometric measures in women with obesity. Thus, the aim of this study was to evaluate the effects of 12-weeks of walk training with self-selected intensity on lipid profile and anthropometric variables in women with obesity.

Methods

Forty-eight women with obesity, not participating in an exercise program for at least the previous 6 months, and absence of continuous use of medication, participated in this study. The study was approved by the local Ethics Committee (number protocol approved 0045.0.136.000-10/2011) and performed in accordance with the ethical standards. All experiments were conducted in accordance with the Declaration of Helsinki. Participants were randomly assigned to: self-selected walking group (SSWG: n = 25; 47.8 ± 6.4 years; $HR_{max} = 173.2 \pm 6.7$ bpm) and control group (CG: n = 23; 47.8 ± 8.4 years; $HR_{max} = 176.5 \pm 10.0$ bpm). Pre- and post-training the subjects underwent anthropometric measurements, and blood samples were collected. In addition, participants were instructed not to ingest alcohol or caffeinated beverages for 24 h preceding each test. The blood samples were collected at rest and in a fasting state for 8–12 h. Concentrations of triglycerides,

total cholesterol (TC), high-density lipoprotein (HDL-cholesterol) were determined by the colorimetric method using commercial kits (Gold Analisa®, Belo Horizonte, Brazil). Low-density lipoprotein (LDL-cholesterol) and very low density lipoprotein (VLDL-cholesterol) were calculated. Subjects of the SSWG participated in 12-weeks of supervised walk conducted 3 times per week. The program consisted of 30 min of walking at a self-selected intensity on an athletics track. The heart rate (HR) was monitored during the sessions of training and rating of perceived exertion (RPE) using Borg scale [5] were recorded at the end of each session. The CG participants were instructed not to perform exercise during the study. Data are presented as mean ± standard deviation (SD). Data were analysed using a Two-way ANOVA with repeated measures, followed by Tukey *post-hoc*. In addition, the ANCOVA was utilised when necessary. To analyse the differences of HR and RPE, the dependent samples *t* test was performed. The *alpha* level was $p < 0.05$. Statistical analyses were carried out using SPSS 20.0.

Results

The HR during the sessions of training was corresponded to ~72% of maximal heart rate in the SSWG. There was difference in percent of maximal heart rate when compared the first session with last session (69% vs 75%, respectively; $p < 0.05$). In relation to RPE, the mean of RPE in the SSWG was 11.1 ± 1.9 during the training. There was not difference in RPE when compared the first session with last session (11.2 ± 1.3 vs 10.8 ± 1.4, respectively; $p > 0.05$).

There was a difference between groups for triglyceride levels pre-intervention ($p < 0.05$). However, there was no difference post-intervention ($p > 0.05$). Only the SSWG presented decreases in the triglyceride levels post-intervention ($p < 0.05$) (Fig. 1). There were no differences between groups for the plasmatic lipid profile pre-intervention ($p > 0.05$). The total-cholesterol did not change
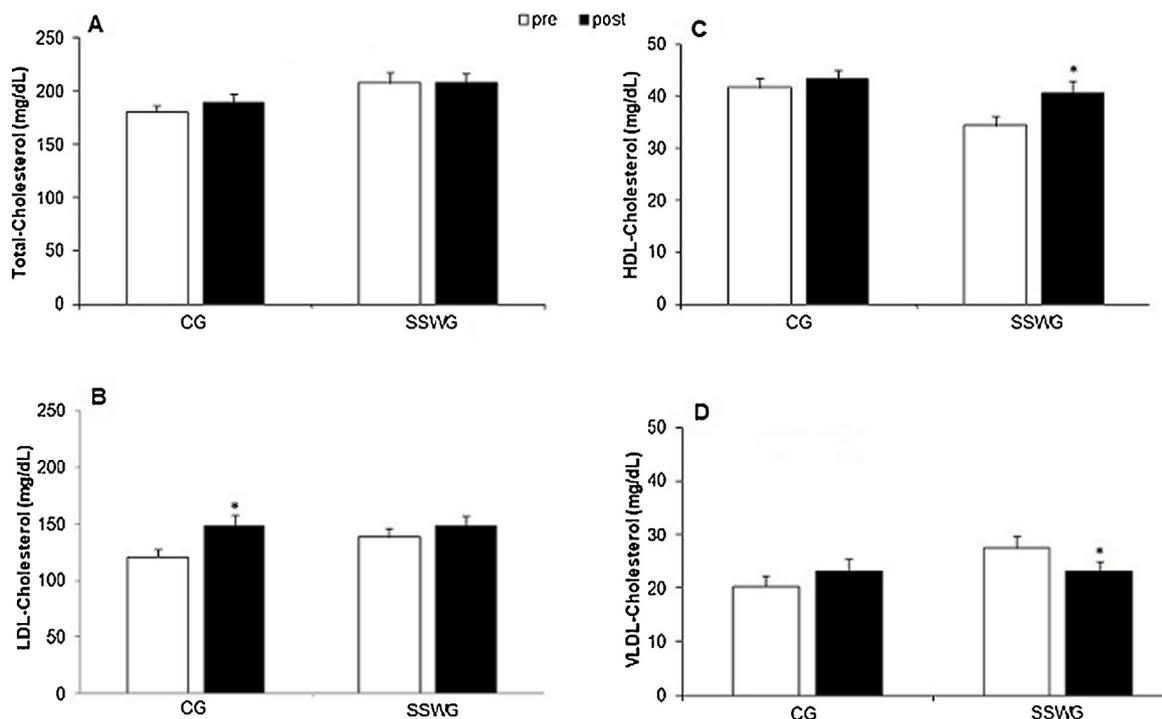
Fig. 2. (A) Total-cholesterol, (B) high-density lipoprotein (HDL-cholesterol), (C) low-density lipoprotein (LDL-cholesterol), and (D) very low-density lipoprotein (VLDL-cholesterol) following 12-weeks of walk training in two training groups: self-selected walking group (SSWG) and control group (CG). Pre-training (white square) and post-training (black square).
*Statistically different from pre-training ($p < 0.05$).

in either group after intervention ($p > 0.05$) (Fig. 2A). The LDL-cholesterol increased in the CG after the intervention ($p < 0.05$), but did not change in the SSWG ($p > 0.05$) (Fig. 2B). The HDL-cholesterol increased after the intervention in the SSWG ($p < 0.05$), but did not change in the CG ($p > 0.05$) (Fig. 2C). In addition, VLDL-cholesterol decreased in the SSWG after the intervention ($p < 0.05$), but not did change in the CG ($p > 0.05$) (Fig. 2D). There were no differences in anthropometric variables, in the body mass (SSWG = 86.4 ± 10.1 kg vs 82.7 ± 11.5 kg, CG = 89.9 ± 14.0 kg vs 90.5 ± 11.2 kg; pre- and post-training, respectively) or BMI (SSWG = 34.4 ± 2.9 kg/m^2 vs 34.5 ± 3.4 kg/m^2, CG = 35.7 ± 3.2 kg/m^2 vs 36.0 ± 2.9 kg/m^2; pre- and post-training, respectively) ($p > 0.05$).

Discussion

In the present study, we found a decrease in triglycerides levels post-intervention only in the SSWG. Furthermore, we found pos-
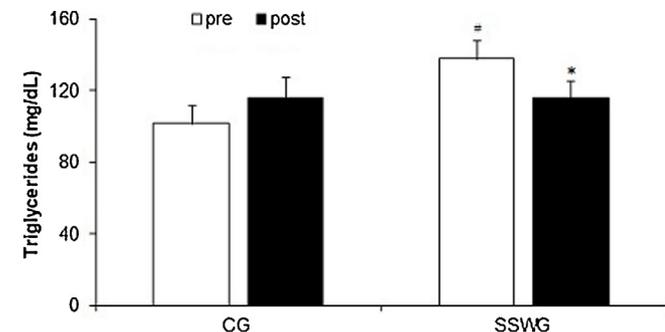

Fig. 1. Triglyceride values following 12-weeks of walk training in two training groups: self-selected walking group (SSWG) and control group (CG). Pre-training (white square) and post-training (black square).
*Statistically different from pre-training ($p < 0.05$).
#Statistically different from control group (CG) ($p < 0.05$).

itive changes in HDL and VLDL-cholesterol concentrations only in the SSWG. Thus, these results demonstrate the importance of walking at a self-selected intensity for health. However, we did not find differences in anthropometric variables. These results corroborate with other studies that found a reduction in triglyceride levels [6] and improved cholesterol levels after aerobic training [7], but were different from another study that showed alterations in anthropometric variables in women with overweight and obesity after aerobic training [8]. These differences may be explained by the sample characteristics and protocols. The mechanisms that promote lipid changes exercise-induced are not well understood. It is believed that exercise itself may increase blood lipid consumption, thus decreasing lipids levels [9]. Mechanisms may involve an increase in activity of lipoprotein lipase (LPL) that promote triglycerides hydrolysis [9]. In addition, the aerobic training promotes a reduction in the risk for hypercholesterolemia by altering lipid profile of other aspects [9]. In summary, it was verified that 12-weeks of walk training with self-selected intensity in women with obesity promoted changes in the lipid profile, independent of changes in anthropometric variables. Future research is needed to examine the effects of walk training with self-selected intensity in others ages, gender and variables related to health. Thus, walk training with self-selected intensity seems to be an interesting alternative for individuals with obesity, providing beneficial effects on health.

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