

## DEVELOPMENT OF A VO<sub>2</sub>PEAK PREDICTION EQUATION IN ELDERLY

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### Introduction

Aging decreases aerobic capacity as determined by direct maximal tests (Hassel et al. 2015). There are indirect methods to assess aerobic capacity such as the 6-min walking test (6MWT). Some equations to predict aerobic capacity have been developed from the 6MWT distance; however, there are no equations to predict aerobic capacity in Latin American elderly. Therefore the purpose of this study was to develop an equation to predict peak aerobic capacity (VO<sub>2</sub>peak) from the 6MWT and anthropometric variables in functional Costa Rican elderly.

### Methods

Participants were 79 Costa Rican functional elderly (69.5 ± 24.5 yr.). Volunteers were excluded if they presented gait problems. Anthropometric measures included body height, weight, body mass index (BMI), and body fat percentage as measured by dual-energy X-ray absorptiometry. Indirect calorimetry was used to determine VO<sub>2</sub>peak on a graded exercise test using the modified Balke protocol, and the 6MWT (Rikli & Jones, 1998) to determine total walking distance. Statistical analyses included Pearson's correlation, repeated measures t-student, Lin's concordance coefficient and Bland-Altman, and multiple linear regression.

### Results

The regression equation for Costa Rican elderly from predictor variables is VO<sub>2</sub>peak = 17.59 + 0.028 (6MWT in meters) – 0.256 (BMI) - 2.567(Gender), with an R<sup>2</sup> = 0.48 and a standard error of estimation (SEE) = 3.25 ml/kg min. No significant differences between predicted (23.26 ± 3.08 ml/kg min) and measured (22.95 ± 4.45 ml/kg min) VO<sub>2</sub>peak values were found (p > 0.05). A high correlation between predicted and measured VO<sub>2</sub>peak values was obtained (r = 0.70, p < 0.01); however, there was a poor concordance between tests according to Lin's coefficient (r = 0.61).

### Discussion

Some variables like the body adiposity (Carpio-Rivera et al. 2015), 6MWD (Fernandes et al. 2016) or the VO<sub>2</sub>max cannot be predicted using reference equations derived from different kind of populations. The new equation to predict aerobic capacity in Costa Rican elderly explains 48% of the variance and has an acceptable predictive error.

### References

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## SIMILAR ACUTE-EXERCISE-INDUCED EFFECTS OF AEROBIC VERSUS RESISTANCE EXERCISE ON ADIPONECTIN AND LIPIDS 30 MINUTES POST-EXERCISE

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### Introduction

Adiponectin is an adipocyte-secreted hormone with anti-atherosclerotic, anti-diabetic and anti-inflammatory properties. Thus far, research into the acute-exercise-induced enhancement of adiponectin concentration following aerobic exercise has been inconsistent (Simpson & Singh, 2008), possibly due to samples being taken immediately post-exercise. Resistance training has shown more promise as a means to increase adiponectin concentration after 1 session (Varady et al., 2010), but has not been widely utilised as an exercise mode in studies on healthy, recreationally active individuals. The aim of this study was to examine and compare the acute-exercise-induced effects of aerobic versus resistance exercise on adiponectin concentration and lipid profiles at a delayed point in recovery; 30 min post-exercise.

### Methods

Ten young, healthy, normoglycaemic and normolipidaemic males (mean age: 26.1 ± 5 years; height: 179 ± 6 cm; body mass 79.1 ± 9.2 kg; BMI 24.7 ± 3.0 kg/m<sup>2</sup>; means ± SD.) performed two acute exercise trials: aerobic (AER) and resistance (RES), randomised in order and matched for total energy expenditure. AER consisted of 30 minutes cycling at 70% VO<sub>2</sub>max and RES, ~30 minutes of resistance exercise at 70% 1RM. Both trials were completed within the same week with at least 48 hours separation. Venous and capillary samples were collected at rest and 30 minutes post-exercise for determination of serum adiponectin and lipid profiles.

### Results

Within both the AER and RES trials, there was a significant drop in serum adiponectin concentration from baseline to 30 minutes post-exercise [AER: 27.1 ± 9.6 µg/ml vs 25.3 ± 11.1 µg/ml; p=0.04; RES: 26.8 ± 10.0 µg/ml to 25.4 ± 10.7 µg/ml, p=0.04]. There was no significant main effect of mode of exercise (AER vs RES) on the change in serum adiponectin concentration between these two time points (p>0.05). No differences were found, with respect to time or mode, for HDL-C, LDL-C, triglycerides, or total cholesterol.

### Discussion

These findings suggest that serum adiponectin concentration remains attenuated compared to its pre-exercise value 30 minutes into recovery, following either acute AER or RES exercise and the two exercise modes do not differ in their effect on lipids. One bout of acute RES or AER exercise will not improve adiponectin expression in healthy, recreationally active males within this time-frame. Further research should focus on determining the temporal sequence of adiponectin responses to acute exercise in an extended post-exercise phase.

### References

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