

Effects of Arm Swing Exercise Training on Cardiac Autonomic Modulation, Cardiovascular Risk Factors, and Electrolytes in Elderly Persons with Prehypertension

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Abstract

Introduction: Prehypertension increases the future risk of hypertension and subsequent cardiovascular disease (CVD). Exercise therapy is recommended in all the main clinical guidelines concerning CVD. This study aimed to investigate the effect of arm swing exercise (ASE) training on cardiac autonomic modulation, cardiovascular risk factors, and blood electrolytes in elderly persons with prehypertension.

Methods: Subjects were 50 elderly individuals with prehypertension (aged 66.90 ± 5.50 yr, BMI 23.84 ± 3.65 kg/m²). They were randomly assigned into either ASE group or control group. Subjects in the ASE group underwent a 12-week ASE training program at a frequency of 30 min/day, 3 days/week. Subjects in the control group maintained their daily routine activities minus regular exercise. Blood pressure, heart rate variability (HRV), cardiovascular risk factors including blood glucose, lipid profile, high-sensitive C-reactive protein (hsCRP), and electrolytes were evaluated prior to and subsequent to the intervention.

Results: Following the 12-week intervention, systolic blood pressure (SBP) and serum hsCRP concentration were significantly lower, while serum high-density lipoprotein (HDL)-cholesterol, potassium (K⁺), magnesium (Mg²⁺) concentrations, standard deviation of normal R-R intervals (RMSSD) and high frequency (HF) power values were significantly higher in the ASE group when compared to the control group ($p < 0.05$).

Conclusions: ASE training decreased SBP and serum hsCRP concentration, increased serum HDL-cholesterol, K⁺, and Mg²⁺ concentrations and increased RMSSD and HF power values in elderly persons with prehypertension. These findings support the broad recommendation that physical exercise is imperative in yielding a plethora of health benefits for the prevention and management of hypertension.

Keywords: Blood pressure, Arm swing exercise, Cardiovascular disease, Heart rate variability