https://doi.org/10.6063/motricidade.31715

Abstract

Acute physiological response to three different isometric exercises on hemodynamic responses in medicated hypertensives

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Conflict of interest: nothing to declare. **Funding:** nothing to declare

According to the literature, exercise sessions for the population with hypertension are usually combined with cardiovascular exercise followed by isometric muscle strength exercise. So, this study aims to evaluate the acute effect of 3 strength exercises focusing on isometric contractions on Systolic Blood Pressure (SBP), Diastolic Blood Pressure (DBP), Mean Blood Pressure (MAP) and heart rate (HR). A total of 8 hypertensive participants (age= 53.13 years old) with controlled BP by proper medication without beta-blockers held a control and an exercise session. The exercise session consisted of 3 sets of 1 isometric contraction of 60 sec in each of the 3 strength exercises: the unilateral handgrip (30% of maximal voluntary contraction), the forearm plank and the wall-sit (at a self-perceived moderate intensity). During the exercise session, SBP, DBP and perceived exertion (RPE) were registered after each isometric set, and HR was continuously measured (in order to record all the necessary data and guarantee the safety of the participants). The t-test revealed differences in all studied variables between the control session and the combined exercise sessions (p=0.001), except for DBP (p=0.056). When we compare the 3 isometric exercises with each other and look at the SBP variable,

we verify whether there are statistically significant differences between the handgrip and the plank ($p=0.019$). The forearm plank exercise promoted a significant ($p\leq0.05$) higher HR and SBP response related to the large muscle volume involved in performing this exercise. The unilateral handgrip was associated with the lowest BP values, probably very dependent on the smaller muscle mass involved and the less demanding position adopted for the exercise. In conclusion, it can be posited that, regardless of the exercise performed, an increase in the volume of muscle mass engaged corresponds to a more pronounced cardiovascular response.

Keywords: static contraction; blood pressure; handgrip exercise; forearm plank exercise; wall-sit exercise