Effects of Resistance Training on Specific Bioelectrical Impedance Vector Analysis in Elderly Women

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ABSTRACT

The raw values from bioelectrical impedance analysis (BIA), resistance (R) and reactance (Xc), are used to determine phase angle, an indicator of cellular health, which is related to functional status and impaired prognosis with disease. Graphical interpretation of R, a measure of cellular hydration status, and Xc, a measure of cellular membrane integrity, relative to body segment geometry, termed specific bioelectrical impedance vector analysis (BIVA), has been proposed as a method of body composition evaluation in elderly adults. The purpose of this investigation was to examine the effects of resistance training on phase angle and specific BIVA in elderly women.

INTRODUCTION

• The raw values from bioelectrical impedance analysis (BIA), resistance (R) and Reactance (Xc) are used to determine phase angle, an indicator of cellular health, which is related to functional status and impaired prognosis with disease.

METHODS

• Subjects: 11 healthy, ambulatory women (mean ± SD; age 73.5 ± 8.1 yrs; mass 59.5 ± 7.5 kg) completed a three times weekly, 6-month full-body progressive resistance training program. Testing procedures, which included whole-body, single-frequency (50 Hz) BIA, circumference measurements, and phase angle were determined using repeated measures analysis of variance. The relationship between changes (t6-t0) in the BIA values and strength (5RM) were analyzed using Pearson correlations.

RESULTS

• Muscle Strength: 5RM increased at t3 (Δ: 12 kg; p<0.01) and t6 (Δ: 30 kg; p<0.01). 5RM, phase angle, R, and Xc were significantly associated (r=0.79; p<0.05). 5RM increased at t6, but not t3.

• RESULTS CONT.

SUMMARY & CONCLUSIONS

• The 6-month resistance training program improved leg extension strength in this sample of elderly women.

• This biopredictive properties determined from BIA and evaluated with specific BIVA changed as a result of 6 months of resistance training in elderly women.

• Muscle strength, Xc, and R showed a nonsignificant positive correlation (r=0.51; p=0.11). An increase in Xc, and R is related to improved leg strength. A significant increase in R was noted with both phase angle and leg extension 5RM.

• Positive correlation (r=0.51; p=0.11) between Xc and R was noted, and both variables increased significantly at t6.

• The 6-month resistance training program improved leg extension strength in this sample of elderly women.

• These findings highlight the maintenance of baseline cellular hydration with increasing cellular membrane integrity. To alter cellular composition in elderly women, a significant increase in R and Xc should be noted.

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REFERENCES


