TACSM Abstract

Different Orders of Combined Upper- and Lower-Body Resistance Exercise on Pulse Wave Reflection

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ABSTRACT

Acute upper-body resistance exercise (RE) has been shown to induce greater impacts on pulse wave reflection (PWR) compared to lower-body RE. However, different orders of combined upper- and lower-body RE on PWR is unknown. **PURPOSE**: To evaluate the effects of different orders of combined upper- and lower-body RE on PWR in active men. **METHODS:** Sixteen men (22±2 yrs) volunteered for the study. PWR was assessed at rest, 10 (R1), and 20 (R2) minutes after either upper- and lower-body RE (UL) or lower- and upper-body RE (LU) at 75% 1-repetition maximum for 3 sets of 10 repetitions, 1.5- and 2-minute rests between sets and exercises, respectively, was allotted. The upper- and lower-body RE consisted of latissimus dorsi pulldown and incline chest press, and knee extension and knee flexion, respectively. A 2x3 repeated measures ANOVA was used to evaluate the conditions across time on PWR. **RESULTS:** There was no difference ($p=0.42$) on exercise volume between UL and LU. There were significant condition-by-time interactions ($p<0.05$) for aortic systolic blood pressure (ASBP), augmentation pressure (AP), augmentation index (AIx), and AIx normalized at 75 bpm (AIx@75) such that LU significantly elevated ASBP (UL: rest: 103±6 mmHg; R1: 101±8 mmHg; R2: 100±7 mmHg; LU: rest: 102±5 mmHg; R1: 104±6 mmHg; R2: 103±8 mmHg), AP (UL: rest: 4.7±3.9 mmHg; R1: 3.5±5.6 mmHg; R2: 2.4±4.0 mmHg; LU: rest: 4.5±3.2 mmHg; R1: 10.8±5.0 mmHg; R2: 5.9±4.7 mmHg), AIx (UL: rest: 12.5±9.1%; R1: 8.5±14.4%; R2: 6.6±12.4%; LU: rest: 12.2±8.5%; R1: 27.5±10.4%; R2: 105.5±12.3%), and AIx@75 (UL: rest: 3.6±10.0%; R1: 16.8±13.7%; R2: 12.9±11.2%; LU: rest: 2.5±10.5%; R1: 37.7±9.6%; R2: 23.8±12.7%) compared to UL at R1 and R2. Heart rate (UL: rest: 57±10 bpm: R1: 94±12 bpm; R2: 89±12 bpm; LU: rest: 57±8 bpm; R1: 94±11 bpm; R2: 90±11 bpm) significantly increased ($p<0.001$) after R1 and R2 compared to rest after UL and LU without difference between conditions. However, there was no change on aortic diastolic blood pressure. **CONCLUSION:** These data suggest that different orders of combined upper- and lower-body RE induce different responses on pulse wave reflection. In addition, LU significantly elevated PWR than UL which might place greater workload to the heart in active men. Starting at upper-body RE then finishing at lower-body RE may be a more cardio-protective workout regime.