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6 Months of Aerobic Exercise Training Preserves Central Pressure Wave Indices in Older Adults

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With advancing age, arterial stiffness increases, leading to faster aortic forward wave transmission and intensified wave reflection. Regular exercise, particularly aerobic exercise, exerts distinct beneficial effects not only on blood pressure but also on pressure wave reflection in younger individuals. Specifically, aerobic exercise enhances arterial compliance in young individuals, thereby reducing wave reflection. Improved arterial elasticity and reduced arterial stiffness contribute to the mitigation of reflected wave intensity, positively affecting cardiovascular efficiency. In older individuals, regular aerobic exercise reduces central arterial stiffness and improves blood pressure. However, the impact of aerobic exercise on pressure waveform indices using wave separation analysis in older individuals is unknown. **PURPOSE:** To evaluate brachial blood pressure and pressure waveform indices in older individuals before and after 6 months of aerobic exercise training. **METHODS:** In a study of 34 older individuals (70±7y; 6M/28F), brachial systolic blood pressure (bSBP), brachial diastolic blood pressure (bDBP), forward pulse height (Pf), reflected pulse height (Pb), and reflection magnitude (REF MAG) were measured before (BL) and after 6 months (6mos) of an at-home, virtual aerobic exercise training intervention. **RESULTS:** There was no significant difference in bSBP and bDBP before and after the aerobic exercise training intervention (bSBP: BL 134±14mmHg, 6mos 133±13; bDBP: BL 74±7, 6mos 74±8mmHG; $p>0.05$ for both). Further, there was no significant difference in Pf, Pb, or REF MAG (Pf: BL 31±7mmHg, 6mos 31±6mmHg; Pb: BL 20±4mmHg, 6mos 19±3mmHg; REF MAG: BL 65±8%, 6mos 65±2%; $p>0.05$ for all). **CONCLUSIONS:** 6 months of aerobic exercise training preserves indices of pressure wave reflection in older individuals. **SIGNIFICANCE/NOVELTY:** This is the first study to look at the efficacy of an at-home, virtual aerobic exercise training intervention on blood pressure waveform indices in older adults. The pressure waveform indices provide a novel and detailed insight into blood pressure dysregulation and aberrant wave reflection that occurs with aging. As aerobic exercise influences and modulates blood pressure and, thus the waveform, studying the effect of aerobic exercise training on these indices is particularly relevant to aging and cardiovascular health.

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