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EDITORIAL

Short-term Aerobic Exercise in the Elderly Promotes Blood Pressure Reduction

Hypertension (HTN) is a widely prevalent risk factor for cardiovascular disease, affecting well over 50 million men and women in the United States alone. Secondary to progressive arterial wall injury and remodeling, HTN significantly increases the risk for developing coronary artery disease, myocardial infarction, sudden death, cerebrovascular disease and stroke, peripheral arterial disease, retinopathy, aortic aneurysms, left ventricular hypertrophy and congestive heart failure, and nephropathy among other clinical sequelae. The etiology of HTN is multifactorial and its severity is impacted significantly by genetic background as well as environmental and lifestyle factors.

The incidence of HTN increases in both men and women as a function of age.^{1,2} Elderly patients are also vulnerable to the development of isolated systolic hypertension, a clinical entity also associated with significant elevations in cardiovascular disease. Despite the availability of a plethora of antihypertensive agents with a broad range of mechanistic utility, only approximately one-third of hypertensive patients achieve nationally

defined targets for blood pressure.³ The percentage of controlled hypertensive patients declines progressively with advancing age.⁴ This is unfortunate. Both the Systolic Hypertension in the Elderly Program⁵ and the Systolic Hypertension in Europe Trial⁶ demonstrated that elderly patients experience significant reductions in cardiovascular morbidity and mortality when treated with antihypertensive medications.

According to the most recent Joint National Commission guidelines for hypertension, lifestyle modifications such as exercise, weight loss, and salt and dietary restriction play important roles in blood pressure management.⁷ As patients age, they tend to gain weight and engage in lower levels of exercise, augmenting risk for HTN development. Instituting sustained lifestyle modifications in populations of any age range is challenging with relatively poor long-term adherence. Among more elderly patients, there is also the issue of whether or not instituting an exercise regimen may constitute an intervention best described as “too little, too late.”

In this issue of the *Journal of*

Applied Research, Huang and coworkers explore the effect of moderate and intense aerobic exercise on blood pressure in sedentary patients aged 75 years and older. After only 10 weeks of exercise, systolic blood pressure (SBP) reductions were observed relative to the group that did not exercise. Among patients in the high-intensity exercise group, resting SBP was significantly reduced by 7.8 mmHg (148.3 ± 22.8 mmHg vs 140.5 ± 27.2 mmHg; $P < 0.05$). In the moderate-intensity group, the SBP showed a nonsignificant trend toward reduction of approximately 5.2 mmHg (145.8 ± 17.7 mmHg vs 140.6 ± 23.6 mmHg). These differences were observed independent of changes in weight. Importantly, the SBP in the control group increased by 2.6 mmHg (133.1 ± 23.9 mmHg vs 135.7 ± 14.8 mmHg). There were no differences noted in diastolic blood pressure in the exercise groups relative to the control group over the time course studied.

This study provides an important demonstration of the capacity of exercise to meaningfully impact SBP in sedentary octogenarians. These data support the contention that pharmacologic intervention should be coupled with exercise and other lifestyle modification even in our more elderly patients, assuming there are no contraindications to the institution of aerobic exercise. Huang et al show that, when it comes to introducing exercise as a therapeutic modality, *it is never too late*. The vasculature of these patients remains apt to respond to this intervention in a clinically meaningful manner. It will be of interest to determine if longer term exercise impacts blood pressure progressively

more over time and if patients reach a point when DBP is also impacted significantly. In addition to its effects on blood pressure, exercise would also be expected to reduce insulin resistance and the development of metabolic syndrome and diabetes mellitus. This study warrants replication in a larger sample size over a longer follow-up period.

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