

# AEROBIC EXERCISE IMPROVES CARDIORESPIRATORY FITNESS BUT DOES NOT REDUCE BLOOD PRESSURE IN PREHYPERTENSIVE AFRICAN AMERICAN WOMEN

**Objective:** To determine the effectiveness of a 10-week aerobic exercise training intervention on blood pressure, cardiorespiratory fitness, and workload in African American women with prehypertension.

**Design:** After we obtained informed consent and medical clearance, each participant underwent baseline measurements, an aerobic exercise-training regimen, and postintervention assessments.

**Setting:** This investigation took place in Columbus, Ohio, on the campus of The Ohio State University.

**Participants:** Twelve sedentary African American women with prehypertension volunteered to participate.

**Interventions:** Study participants trained three days per week for 30 minutes per session at an intensity of 70% maximal oxygen consumption ( $VO_2$  peak) for 10 weeks.

**Main Outcome Measures:** Blood pressure, cardiorespiratory fitness, and workload achieved.

**Results:** Exercise training resulted in a significant improvement in cardiorespiratory fitness and workload capacity. However, no significant reductions in blood pressure were seen after the 10-week aerobic exercise period.

**Conclusions:** Ten weeks of 30 minutes of aerobic exercise, three times a week at 70%  $VO_2$  peak, is a sufficient stimulus to improve cardiorespiratory fitness and workload achieved. However, this exercise regimen was not adequate in eliciting a simultaneous reduction in systolic, diastolic, or mean arterial blood pressure in this cohort of prehypertensive African American women. Additional studies are needed to determine specific exercise protocols that would be effective in lowering blood pressure in various populations. These exercise protocols may vary across ethnicity, sex, and disease status. (*Ethn Dis.* 2007;17:55–58)

**Key Words:** Blacks, Cardiovascular Health, Hypertension, Minorities, Physical Activity

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## INTRODUCTION

Recently, the Joint National Committee (JNC) on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure identified a new blood pressure category termed prehypertension. Prehypertension, formerly considered a “normal” blood pressure, is associated with an increased risk of developing full-scale hypertension (HTN) and associated co-morbidities. Prehypertension is defined as systolic (SBP) of 120–139 mm Hg or diastolic (DBP) of 80–89 mm Hg and indicates an increased need for frequent followup and lifestyle modifications.<sup>1</sup> Hypertension and prehypertension currently affect nearly 60 million Americans and close to one billion people worldwide. The prevalence of hypertension and prehypertension among African American women (45%) is higher than among Caucasian and Mexican American women (25% and 29%, respectively).<sup>2</sup> The JNC has recommended several behavioral interventions that include consistent physical activity as a treatment for HTN.<sup>1</sup> Structured physical activity is an effective nonpharmacologic intervention to improve cardiovascular health and slow the progression of chronic illnesses, such as hypertension.<sup>3</sup> In 1998, Ducey et al<sup>4</sup> concluded that a consistent aerobic exercise-training regimen was effective in improving cardiorespiratory fitness (maximal oxygen consumption, or  $VO_2$  peak) in African American women. Additionally, in a cohort of 215 obese African

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Americans, Randall et al found that aerobic exercise resulted in significant reductions in SBP (7 mm Hg) and pulse pressure (5 mm Hg).<sup>5</sup> Although these studies support the hypothesis that aerobic exercise is an effective treatment in African Americans, no studies have identified the effects of an exercise program in persons classified as prehypertensive. Therefore, the purpose of this investigation was to determine the effectiveness of a 10-week aerobic exercise-training regimen on resting blood pressure, cardiorespiratory fitness, and workload in prehypertensive African American women. We hypothesized that this intervention would significantly reduce blood pressure levels while increasing aerobic capacity and workload achieved.

## METHODS

### Subjects

Twelve sedentary, African American women volunteered to participate. A power analysis revealed that an *N* of 10 would be sufficient to detect differences in blood pressure and fitness-related variables as a result of exercise training. Subjects were required to meet the following inclusionary criteria: African American woman, 30–45 years of age, body mass index (BMI) 25–35 kg/m<sup>2</sup>,

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