Cardiorespiratory fitness can delay male, age-associated blood pressure hikes

September 15 2014

A man's cardiorespiratory fitness can drastically delay the natural, age-associated increase of his blood pressure over his adult life span. According to a study published today in the *Journal of the American College of Cardiology*, men with higher fitness levels experience a delay in the development of hypertension when compared to those with lower fitness levels.

Exercise is well-established as a method to prevent heart disease, and it is a component of an overall healthy life. But this study examined whether a man's improved fitness level delays the age ranges for naturally-occurring systolic blood pressure (SBP) and diastolic blood pressure (DBP) hypertension in males. The SBP number, or the top number in a blood pressure reading, indicates the force of each heart beat as it contracts and pushes blood through the arteries to the rest of the body. The DBP pressure number, or the bottom number in a blood pressure reading, indicates the pressure in the arteries when the heart is at rest between beats.

"Since regular physical activity is the primary and most modifiable determinant of fitness level, our results underscore the importance for a man to increase his regular physical activity to prevent his natural, aging-related rise in blood pressure," said study co-author Junxiu Liu, M.D., PhD candidate, Department of Epidemiology and Biostatistics, Arnold School of Public Health, University of South Carolina, Columbia, S.C.

Data analysis reveals that the average low fit male's SBP begins to

increase to prehypertension levels (120 mmHg) about the age of 46 while his DBP begins to increase to prehypertension levels (80 mmHg) about the age of 42. However, this study suggests that those men with a high fitness level are likely to reach the age at which normal SBP increases about a decade later, approximately at age 54, while the DBP does not reach prehypertension level until advanced ages (approximately at age 90). This implies that improving fitness levels may reduce the duration of elevated blood pressure.

"We now know that a man's hypertension development may be delayed by improving his fitness levels. In other words, men with higher fitness levels experienced normal systolic blood pressure increases later in life than those with low fitness levels, said study co-author Xuemei Sui, M.D., MPH, PhD, Assistant Professor, Department of Exercise Science, Arnold School of Public Health, University of South Carolina, Columbia, S.C.

Liu said, "To move out of the low fit category, men should do at least 150 minutes of moderate-intensity of physical activity such as brisk walking, jogging, running, etc weekly. This level of activity or exercise is the current recommendation from the United States Department of Health and Human Services."

Researchers studied 13,953 men between the ages of 20 and 90 who were free of hypertension, cardiovascular disease and cancer over a 36-year period (1970-2006) to determine whether there is a relationship between cardiorespiratory fitness and the increase in blood pressure with age. This data was drawn from the Aerobics Center Longitudinal Study where the participants completed from three to 28 follow-up medical examinations during the specified time frame (The mean was 3.8). Fitness was measured by a strenuous cardiovascular treadmill exercise stress test. A cardiovascular exercise stress testing in conjunction with ECG has been established as one of the focal points in the diagnosis and

prognosis of cardiovascular disease.

"Also interesting to note is that when we examined the percentage of body fat data, the systolic and diastolic numbers were not significantly changed," Sui said. "These results support our hypothesis that a man's age-related blood pressure rise was independent of his percentage of body fat."

Approximately one-third of American adult males have high blood pressure, according to the Centers for Disease Control. Genetics aside, arterial and arteriolar stiffness are the main factors contributing to the natural increase in a male's blood pressure.

The research sample for this study included only men. The effects of cardiorespiratory fitness on a woman's age-associated blood pressure increases were not researched in this study.

"We will investigate this topic in the near future." Sui said.

Provided by American College of Cardiology