The heart responds differently to exercise in men vs. women

March 27 2014

The formula for peak exercise heart rate that doctors have used for decades in tests to diagnose heart conditions may be flawed because it does not account for differences between men and women, according to research to be presented at the American College of Cardiology's 63rd Annual Scientific Session.

The simple formula of "220 minus age" has been widely used to calculate the maximum number of heart beats per minute a person can achieve. Many people use it to derive their target heart rate during a workout. Doctors use it to determine how hard a patient should exercise during a common diagnostic test known as the exercise stress test.

After analyzing more than 25,000 stress tests, the researchers found significant differences between men and women and developed an updated formula to reflect those nuances.

"The standard that's currently in use is somewhat outdated," said Thomas Allison, M.D., cardiologist and director of stress testing at Mayo Clinic, and senior author of the study. "We want to make sure that when people do the stress test, they have an accurate expectation of what a normal peak heart rate is. Every so often, you need to recalibrate what's considered normal."

The new formula can help people better optimize their workouts and also improve the accuracy of test results. Stress tests, which are commonly used to help diagnose conditions such as coronary heart

disease, heart valve disease and heart failure, require patients to exercise near their top capacity while technicians monitor the patient's cardiac performance.

The researchers drew data from 25,000 patients who took stress tests at Mayo Clinic between 1993 and 2006. The sample included men and women 40 to 89 years of age who had no history of cardiovascular disease.

The study reveals that although everybody's peak heart rate declines with age, the decline is more gradual in women. As a result, the previous formula overestimates the peak heart rate younger women can achieve and underestimates the peak heart rate of older women.

Women in the age range of 40 to 89 years should expect their maximum heart rate to be 200 minus 67 percent of their age. In men, the formula is 216 minus 93 percent of their age. For women younger than 40, the relationship of heart rate to age may be different, as an insufficient number of tests on women younger than 40 were available to provide reliable results.

The study also showed that younger men have a lower resting heart rate and higher peak heart rate than women and that men's heart rates rise more dramatically during exercise and return to normal more quickly after stopping. The study did not investigate the physiological reasons behind the differences, although the researchers suggest hormones, especially testosterone, may play a role.

The previous formula was based on a study researchers now recognize as having serious limitations. For example, it included few women, a weakness common among older studies.

"It's logical that an equation developed 40 years ago based on a group

that was predominantly men might not be accurate when applied to women today," Allison said. "But sometimes things just get stuck."

Changes since the 1970s in terms of average body weight, fitness levels and attitudes toward exercise – particularly among women – justify a re-evaluation of peak heart rate norms, Allison said. Other recent studies have offered updates to the formula, but this study uses a larger sample size and is the first to include data from both men and women.

Provided by American College of Cardiology

Citation: The heart responds differently to exercise in men vs. women (2014, March 27) retrieved 6 May 2024 from https://medicalxpress.com/news/2014-03-heart-differently-men-women.html

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.