

Strength training improves vascular function in young black men

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University of Illinois graduate student Marc Cook and his colleagues found that young African American men experienced some cardiovascular benefits from weight training that Caucasian men of the same age did not. Credit: L. Brian Stauffer

Six weeks of weight training can significantly improve blood markers of cardiovascular health in young African-American men, researchers report in the *Journal of Human Hypertension*.

The researchers measured blood markers associated with inflammation, immune response or the remodeling of arteries that normally occur after tissue damage, infection or other types of stress. They found that levels

of two of these markers dropped significantly in [African-American men](#) but not in Caucasian men after six weeks of [resistance training](#).

"This suggests that resistance [exercise training](#) is more beneficial in young African-American men than in [Caucasian men](#) of the same age," said Bo Fernhall, the dean of the College of Applied Health Sciences at the University of Illinois at Chicago. Fernhall led the study as a professor in the department of kinesiology and community health at the Urbana-Champaign campus. The 14 African-American and 18 Caucasian study subjects were matched for [body mass index](#), [cardiovascular fitness](#) and age. None had previously been trained in endurance or [resistance exercise](#).

African-Americans are known to have higher rates of cardiovascular disease than Caucasians, Fernhall said. In particular, "hypertension, stroke and [kidney disease](#) are much, much higher in the [African-American population](#)," he said.

Some of these problems start young.

"Higher blood pressures in African-American children have been shown as young as 8 to 10 years of age," Fernhall said. "So there's obviously something going on that predisposes the African-American population to end stage disease, hypertension and stroke and the more debilitating diseases later on in life."

A previous study led by Fernhall and his doctoral student Kevin Heffernan (an author on the new paper as well) found that resistance training reduced levels of [C-reactive protein](#) (CRP) in the blood of African-American, but not Caucasian, men. This protein is a reliable marker of [systemic inflammation](#). Levels of CRP rise after injury or infection, and chronically elevated levels are sometimes associated with heart disease and cancer.

The new study looked at other markers that could signal trouble in the arteries: MMPs, which help remodel blood vessels after injury or infection; and 8-isoprostane, a marker of oxidative stress involving chemically charged ions or molecules called reactive oxygen species. Both markers went down in the African-Americans, but not the Caucasians, after resistance training.

The researchers were surprised to see that initial levels of MMP-9 were lower in African-Americans before the weight training.

"It may be that MMP-9 has a different effect on the vasculature of African-Americans than it does on Caucasians," said Illinois doctoral student Marc Cook, who conducted the new analysis. "We don't know."

The decrease in MMP-9 was significantly correlated with the increase in muscle strength in the African-American men, Cook said. He sees the reduction in MMP-9s and 8-isoprostane as a positive outcome in the African-American men.

Previous studies showed that "aerobic exercise actually reduces oxidative stress, and reduces isoprostane," Cook said. "But nobody had a clue about resistance training."

Cook said he now knows what to say to African-American men who ask him why they should exercise.

"If you don't like cardiovascular exercise, if you don't like running on a treadmill, if you can't play basketball or you're not good at it, you can lift weights and improve your health, especially when it comes to high blood pressure, which happens to run in our family," he said. "If you just want to lift weights and you do it on a regular basis, you could improve your function."

"The overall goal of our departmental research here at the U. of I. is to explore the use of exercise as adjunct therapy for disease, while providing a public health message and evidence about how exercise is beneficial, even at an early age," said Illinois kinesiology and community health professor Jeffrey Woods, a co-author on the study.

More information: The paper, "Effect of Resistance Training on Biomarkers of Vascular Function and Oxidative Stress in Young African American and Caucasian Men," is available online:

[www.nature.com/jhh/journal/vao ... full/jhh201248a.html](http://www.nature.com/jhh/journal/vao...full/jhh201248a.html)

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