

Aorta more rigid in African-Americans, may explain rates of hypertension and heart disease

November 10 2016

African-Americans have more rigidity of the aorta, the major artery supplying oxygen-rich blood to the body, than Caucasians and Hispanics, according to a study by UT Southwestern Medical Center cardiologists.

The finding is important because African-Americans are the group at greatest risk of high blood pressure and organ damage caused by high blood pressure, and aortic rigidity is associated with high [blood pressure](#).

The study examined data from some 2,500 participants in the Dallas Heart Study, a multi-ethnic population-based cohort. The researchers used two methods to assess stiffness of the aorta, which is the largest artery in the body, running from the top of the left ventricle in the heart down to the abdomen. Both systems of measurement found greater stiffness in the aortas of African-Americans.

"Our demonstration of ethnic differences in arterial stiffness is an important step in understanding the mechanisms that mediate ethnic differences in cardiovascular disease," said Dr. Wanpen Vongpatanasin, Professor of Internal Medicine at UT Southwestern Medical Center, and co-senior author of the study, which appears online in the *Journal of the American College of Cardiology: Cardiovascular Imaging*.

Hispanics in the study had an intermediate level of aortic stiffness, greater than Caucasians, but less than that of African-Americans.

The study found that both African-Americans and Hispanics had smaller diameter aortas, after adjustments were made for weight.

"This finding suggests that there may be a mismatch between aortic diameter and adiposity, which contributes to the increased rigidity," said Dr. Vongpatanasin, who holds the Norman and Audrey Kaplan Chair in Hypertension and the Fredric L. Coe Professorship in Nephrolithiasis in Mineral Metabolism.

Other possible mechanisms underlying the increased levels of [aortic stiffness](#) in African-Americans and Hispanics include greater sodium intake among African-Americans and Hispanics, lower intake of potassium, and genetic differences in collagen content. Collagen is a protein fiber that is a key component of connective tissue such as bone and artery walls.

According to figures from the Centers for Disease Control and Prevention, 43 percent of African-American men and 45.7 percent of African-American women have hypertension, or [high blood pressure](#), compared with 33.9 percent of Caucasian men and 31.3 percent of Caucasian women.

"Hypertension is strongly associated with heart attack and stroke. Our study provides a potential explanation for excess risk of hypertension and resultant organ complication in African-Americans, who are at particularly high risk of [cardiovascular disease](#)," said Dr. Vongpatanasin.

The Dallas Heart Study is an ongoing, multi-ethnic epidemiologic study, funded by the Donald W. Reynolds Foundation. More than 6,000 individuals in Dallas County have participated in the study, which has led to more than 200 published papers and key findings about heart disease, cholesterol, and liver disease.

More information: Akshay Goel et al, Ethnic Difference in Proximal Aortic Stiffness, *JACC: Cardiovascular Imaging* (2016). [DOI: 10.1016/j.jcmg.2016.07.012](https://doi.org/10.1016/j.jcmg.2016.07.012)

Provided by UT Southwestern Medical Center

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