

Stiffening of the arteries detected in multi-ethnic study of young adults

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Stiffening of the arteries usually related to aging can be detected in early adulthood using a method known as pulse wave velocity, according to a new study led by researchers at King's College London with the University of Glasgow. Alongside a lack of physical activity, stresses such as perceived racism were also associated with stiffening of the arteries of the 21-23 year-olds who took part in the multi-ethnic study.

Arterial stiffness, measured as aortic pulse wave velocity (PWV), has become a useful indicator of cardiovascular risk. However, few studies have investigated its development over time, particularly in young adults and [ethnic minority](#) populations. As arterial stiffening develops over the course of one's life, detecting factors that determine its progression should be useful in delaying or preventing a decline in arterial health.

The study, published in the journal *Hypertension*, tested how factors measured twice previously in childhood in the Determinants of Adolescent, now young Adult, Social wellbeing and Health (DASH) study, particularly [body size](#) and blood pressure, affected the emergence of aortic stiffness in young adults. The DASH study is based at the MRC/CSO Social and Public Health Sciences Unit at the University of Glasgow.

Of the original DASH cohort of 6,643 London children from 51 schools covering six ethnic groups tested at ages 11-13, 4,785 were seen again at ages 14-16 and in 2013, 666 took part in a pilot follow-up aged 21-23 years. These [young adults](#) had [aortic stiffness](#), blood pressure and body

size recorded and they were also asked to fill out a questionnaire on social factors such as health behaviors and social economic background. Reported racism was assessed via questions on unfair treatment on the grounds of race, skin color, country of birth, or religion in various locations (school, street, work, etc). Half of the participants also wore an ActivePal monitor to measure their [physical activity](#) over five days.

The study found that arterial stiffness increased with blood pressure, greater waist/height ratio, lack of physical activity, and reported racism. Around half of the young adult cohort reported racism, with a greater proportion in the ethnic minority groups than their White peers reporting such incidents.

Despite greater exposure to risk from childhood (overweight, deprivation, racism) among groups such as Black Caribbeans or Black Africans, arterial stiffness was lower compared to their White British peers. However, even at lower blood pressures, some people had stiffer arteries than others.

By age 21 to 23 years nearly half of the men smoked, as did a third of the women. About half the ethnic minority sample reported racism at 21-23y, with a steep rise between 14-16 years and 21-23 years. Both men and women spent some 70% of their waking hours sedentary. However, time spent in moderate to vigorous activity (about 36 minutes a day) was associated with lower (better) [arterial stiffness](#).

Limitations of the study included the fact that physical activity was not measured in detail in the baseline survey of the cohort. The study also had a relatively small sample size of around 100 people per ethnic group and the subgroup in which physical activity was measured was smaller because of cost issues.

Professor Kennedy Cruickshank, first author and DASH's cardiovascular

advisor from the Division of Diabetes and Nutritional Sciences at King's College London, said: "Stiffening or hardening of arteries is now recognised as a powerful indicator of lifetime risk, even after accounting for [blood pressure](#)'s impact. Its effects are on heart and blood vessel disease, stroke and dementia. Our study of young people shows that such arterial stiffening can be detected in the early 20s age group, together with effects from waist size. It confirms the likely importance of exercise in maintaining a healthy body and circulation. We also found reported racism had an effect, which needs to be explored further to understand the mechanisms behind it, probably related to stress hormones."

Professor Seeromanie Harding, lead investigator of the DASH study from the Division of Diabetes and Nutritional Sciences at King's College London and previously at the University of Glasgow, said: "DASH is a unique study because there are few cohorts with an ethnically diverse composition in early adulthood. This is a time when physical health is at its peak, yet when early signs of disease begin to appear. The findings help us understand factors such as being overweight that may adversely affect the cardiovascular health of young people from different ethnic minority populations. They also signal what might protect them as they age."

More information: *Hypertension*, [DOI: 10.1161/HYPERTENSIONAHA.115.07079](https://doi.org/10.1161/HYPERTENSIONAHA.115.07079)

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