

Ethnic Differences in and Childhood Influences on Early Adult Pulse Wave Velocity: The Determinants of Adolescent, Now Young Adult, Social Wellbeing, and Health Longitudinal Study.

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BACKGROUND: Early determinants of aortic stiffness as pulse wave velocity are poorly understood. We tested how factors measured twice previously in childhood in a multiethnic cohort study, particularly body mass, blood pressure, and objectively assessed physical activity affected aortic stiffness in young adults.

PATIENTS AND METHODS: Of 6643 London children, aged 11 to 13 years, from 51 schools in samples stratified by 6 ethnic groups with different cardiovascular risk, 4785 (72%) were seen again at aged 14 to 16 years. In 2013, 666 (97% of invited) took part in a young adult (21-23 years) pilot follow-up. With psychosocial and anthropometric measures, aortic stiffness and blood pressure were recorded via an upper arm calibrated Arteriograph device. In a subsample (n=334), physical activity was measured >5 days via the ActivPal.

RESULTS: Unadjusted pulse wave velocities in black Caribbean and white UK young men were similar (mean±SD 7.9±0.3 versus 7.6±0.4 m/s) and lower in other groups at similar systolic pressures (120 mm Hg) and body mass (24.6 kg/m²). In fully adjusted regression models, independent of pressure effects, black Caribbean (higher body mass/waists), black African, and Indian young women had lower stiffness (by 0.5-0.8; 95% confidence interval, 0.1-1.1 m/s) than did white British women (6.9±0.2 m/s). Values were separately increased by age, pressure, powerful impacts from waist/height, time spent sedentary, and a reported racism effect (+0.3 m/s). Time walking at >100 steps/min was associated with reduced stiffness (P<0.01). Effects of childhood waist/hip were detected.

CONCLUSIONS: By young adulthood, increased waist/height ratios, lower physical activity, blood pressure, and psychosocial variables (eg, perceived racism) independently increase arterial stiffness, effects likely to increase with age.

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Ethnic Differences in Arterial Wave Reflection Are Mostly Explained by Differences in Body Height – Cross-

Sectional Analysis of the HELIUS Study.

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BACKGROUND: Differences in arterial wave reflection and central blood pressure (BP) have been associated with cardiovascular disease (CVD) in various populations and may contribute to ethnic differences in CVD. Whether ethnic differences in wave reflection and central BP can be explained by conventional risk factors for CVD or may result from physiological differences remains undetermined.

METHODS: We examined ethnic differences in augmentation index (AIx) and central systolic BP and their determinants in a large multi-ethnic cohort study in Amsterdam, the Netherlands. A total of 8812 (46% male) participants aged 18-70 years of Dutch, South-Asian Surinamese, African Surinamese and Ghanaian origin were included. AIx and central BP were measured in duplicate using the Arteriograph system.

RESULTS: AIx and central systolic BP were significantly higher in South-Asian Surinamese ($35\pm 17\%$, 126 ± 22 mmHg), African Surinamese ($33\pm 17\%$, 129 ± 23 mmHg) and Ghanaian ($33\pm 16\%$, 135 ± 24 mmHg) as compared with Dutch ($27\pm 17\%$, 118 ± 20 mmHg, all $p < 0.001$). Correction for cardiovascular risk factors only slightly reduced the difference in AIx, whereas correction for body height attenuated age and gender corrected ethnic differences in AIx the most. Differences in central systolic BP were primarily determined by differences in AIx for South-Asian Surinamese and by differences in peripheral systolic BP for subjects of African origin.

CONCLUSIONS: Substantial differences in AIx and central BP exist across different ethnic groups that cannot be explained by differences in conventional risk factors for CVD. These findings may explain part of the underestimation of cardiovascular risk observed in populations of African and South-Asian descent.

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