ADULT LEFT VENTRICULAR MASS IS ASSOCIATED WITH LONG-TERM BLOOD PRESSURE VARIABILITY BEGINNING IN CHILDHOOD IN BLACKS, BUT NOT IN WHITES: THE BOGALUSA HEART STUDY

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Background: Blood pressure (BP) is a very labile physiologic parameter in health and disease. Increased 24-hour ambulatory BP variability is associated with severity of end-organ damage and a higher rate of cardiovascular events, even after adjusting for levels. This study assessed the hypothesis that long-term BP variability from childhood to adulthood, besides levels, is predictive of adulthood left ventricular mass (LVM).

Methods: The longitudinal study cohort consisted of 1053 subjects (718 whites and 335 blacks; 42% males; age=24-48 years; mean age=38.4 years) enrolled in the Bogalusa Heart Study. Study subjects were examined serially 4-14 times for BP from childhood to adulthood over an average of 19.7 years follow-up, since 1973, with 8515 observations of BP. Echocardiography was performed in adulthood between 2001 and 2009. The BP variability from childhood to adulthood was measured as long-term variability from mean levels.

Results: Blacks versus whites showed significantly greater BP variability (mmHg) (9.1 vs 6.7 for systolic BP, p<0.001 and 8.0 vs 6.6 for diastolic BP, p<0.001) and higher LVM index (gram/height in m2.7) (38.8 vs 35.4, p<0.001). In multivariable regression analyses, adjusting for age, sex, body mass index, LDL cholesterol, glucose, and the average long-term BP levels, LVM index (g/m2.7) in adulthood was significantly associated with systolic BP variability (mmHg) (regression coefficient β=0.66, p<0.001) and diastolic BP variability (mmHg) (β=0.81, p<0.001) in blacks, but not in whites. Importantly, the standardized regression coefficients of the BP variability were greater than those of long-term BP levels (β=0.23 vs β=0.11 for systolic BP; β=0.22 vs β=0.06 for diastolic BP).

Conclusions: These findings indicate that long-term BP variations reflecting stimulus-response characteristics are predictive of left ventricular hypertrophy in adulthood, independent of BP levels, among black individuals, which may have implications for preventive cardiology.