Elevated blood pressure remains a major public health problem in the United States, with increasing risks of stroke, heart disease, heart failure, and end-stage renal disease. Although the prevalence of high blood pressure increases with age, hypertension control rates for treated hypertensives decline with age. The prevalence of hypertension among young adults is considerably lower than the rates of older adults, whereas control rates among treated hypertensives are significantly higher among the younger individuals with high blood pressure. Thus, the early identification and treatment of elevated blood pressure are critical components of population high blood pressure control. Likewise, hypertension prevention programs depend on interventions early in life before disease manifestation.

In this issue of Hypertension, Rosner et al describe the levels of blood pressure among children and adolescents from a database of merged population-based data sets. These analyses demonstrate the increase in blood pressure with body size and age among the 58,698 individuals ≤ 17 years of age as part of the Pediatric Task Force database. The investigators also document the racial disparity in blood pressure levels of these young people, which are well-known and documented racial differences in hypertension rates of adults. This article provides a timely set of analyses emphasizing the importance of considering blood pressure in children and adolescents when developing strategies for population high blood pressure control.

The relationship of body size and blood pressure levels is particularly relevant in the assessment of elevated blood pressure in the population. The rate of childhood obesity has significantly increased in the past 2 decades. Data from the National Health and Nutrition Examination Survey showed a 3-fold increase (5.0% to 17.6%) in the prevalence of obesity from 1976 to 2006 for US children and adolescents 12 through 19 years of age. These increasing trends in obesity were consistent for non-Hispanic whites, non-Hispanic blacks, and Mexican Americans. The effects of body size and blood pressure reported by Rosner et al may have even greater implications, because the studies included as part of the Pediatric Task Force data were completed before the dramatic population shift in larger body sizes among children and adolescents in the United States.

The association of body mass and blood pressure level seen in children is consistent throughout adulthood. As presented in the Figure, hypertension increases with increasing waist:hip ratio. Rosner et al reported the consistent association of body mass and blood pressure among blacks and whites, and similar patterns are seen among adult hypertension rates for both race groups. That said, racial disparities remain evident in the prevalence of hypertension, with blacks tending to have higher blood pressures than whites. Although the blood pressure levels of both race groups are strongly associated with body size from childhood through adulthood, the racial disparities are not completely explained by anthropometrics and fat patterning. In fact, the greatest racial differences are identified in the leaner categories of body size, where blacks have much higher hypertension rates than whites. Although the blood pressure levels by race and the inability of body size to completely explain these disparities indicate that other factors are involved in hypertension risks.

These findings in populations of children/adolescents and adults suggest that the genetic and environmental parameters that affect blood pressure levels may be consistent throughout a lifetime. Fetal and early life events have been identified as predictive factors for adult blood pressure and hypertension-related outcomes. The mechanisms associated with blood pressure effects originating in the fetal environment might remain involved into late adulthood and could be keys for future predictive medicine research. The identification of factors associated with the development of hypertension, but before the microvascular and macrovascular markers manifest, is an essential component of high blood pressure prevention.
In the meantime, the results from Rosner et al have high blood pressure control implications. Traditionally, hypertension in children and adolescents has been considered differently from adults with 2 separate sets of guidelines. However, with consistent associations and mechanisms of high blood pressure regulation and risks, perhaps one set of hypertension treatment and control recommendations for all stages of life ages should be developed.

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