Hypertension in children leads to adverse cardiovascular outcomes in adulthood. Low physical activity (PA) levels are associated with increased risk of hypertension and cardiovascular disease in adults, but the relationship between PA and blood pressure in young children is unclear. In this study, we investigated the cross-sectional and longitudinal associations between objectively measured PA and blood pressure in a cohort of UK primary school-aged children from a predominantly South Asian background. We found low PA levels to be associated with increased diastolic blood pressure in children aged 5 to 7 years, independent of body mass index. In addition, low PA levels at age 5 to 7 years were predictive of increased diastolic blood pressure at age 7 to 9 years.

If PA is a risk factor for hypertension in childhood as this study suggests, then intervening to increase PA levels in young children will result in a reduction of the risk of hypertension and consequently cardiovascular disease in later life. The study findings suggest that if the least active children increased their PA levels to those in the highest quartile, this would result in a 2 mm Hg drop in diastolic blood pressure. Although small, this BP reduction equates to a 6% reduction in coronary heart disease and a 15% reduction in stroke-related events. Therefore, PA intervention in children could have a significant impact on some of the major non-communicable causes of morbidity and mortality.

Sympathetic Dysfunction in Prenatal Programming (page 180)

Epidemiologic studies show that adults born small for gestational age have an increased risk for developing hypertension. Historically, low birth weight was predominantly because of intrauterine growth restriction caused by maternal illness, infection, hypertension, drug abuse (including cigarette smoking and alcohol consumption), and uteroplacental insufficiency because premature infants did not survive. Furthermore, an inadequate maternal diet remains a significant and preventable cause for intrauterine growth restriction. The cause for the hypertension in adults born small for gestational age remains largely unknown. Intriguing clinical clues from both humans and animals point to a possible, yet undetermined, role for the sympathetic nervous system. For example, studies comparing humans and rodents born with intrauterine growth restriction found comparable or even exaggerated elevations in blood pressure in response to minor stress. This clue led to the study by Mizuno et al in this issue of Hypertension. The study demonstrates, for the first time, that adult rats born small for gestational age display abnormally exaggerated increases in not only blood pressure but also sympathetic nerve activity in response to acute stress imposed by muscle reflex activation. The findings suggest that the programming of hypertension contributed to a prenatal insult may occur in the brain where sympathetic outflow is regulated. Determining the mechanisms underlying this stress-induced sympathetic overactivity may identify a modifiable risk factor that can be used to treat hypertension in low birth weight adults.

Does White Coat Hypertension Require Treatment? (page 89)

White coat hypertension is generally considered to be a benign condition and does not require treatment. In the substudy of 284 participants from the Hypertension in the Very Elderly Trial (HYVET), we found some very interesting findings which call into question the current accepted clinical practice. These participants from 7 different countries had baseline characteristics that were very similar to the 3845 participants in the main HYVET Trial. Fifty percent of the participants in this trial fulfilled the established criteria for white coat hypertension. As such, a high number of people had white coat hypertension but benefited from treatment of hypertension as evidenced by the results of the main HYVET trial: this finding now raises the question of whether white coat hypertension should be treated in the very elderly. If white coat hypertension were to be treated, then it would have quite significant clinical ramifications. There are several national and international guidelines, which suggest that white coat hypertension does not require treatment. It may be necessary to prove this by conducting a large multicenter clinical trial. The other possibility is that white coat hypertension in the very elderly should be treated until the results of such large clinical trials are known. In summary, this study shows that white coat hypertension is common in the >80-year-old patient and may require treatment. This possibility should be included in national guidelines for treatment in the very elderly.