

Accelerated bone growth may be an indicator of hypertension in children

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Children whose bones are "older" than their chronological age may be at an increased risk of hypertension, according to a study reported today in *Hypertension: Journal of the American Heart Association*. As a result, the investigators suggest that markers of biological maturity should be evaluated in hypertensive children, and that physical activity and diet may deter the accelerated development of biological maturity.

Behind the study lies the hypothesis that the origins of hypertension are associated with abnormalities of growth and maturation in childhood. This study compared bone age as a marker of biological maturation in hypertensive [children](#) with healthy controls closely matched for [body mass index](#) (BMI), age and sex, to assess the association between skeletal maturation and hypertension.

The investigators X-rayed the left-hand wrists of 54 untreated hypertensive Polish children (average age 14.2 years) and compared them to X-ray images of 54 children with optimal [blood pressure](#). Both groups were compared with reference images and rates of maturity were defined as physiological, accelerated and delayed.

Results showed that the healthy controls had a mean bone age of 14.7 (± 2.3 years), which was not significantly different from their mean chronological age. However, in the group with primary hypertension mean bone age was found to be 16.0 (± 2.0) years, reflecting an accelerated rate almost two years more than their chronological age of 14.1 years. The rate of bone age was the strongest predictor of blood

pressure status. The investigators proposed that that some lifestyle modifications, such as increased physical activity and diet, might influence both metabolic abnormalities and the tempo of biological maturity.

Commenting on the study on behalf of the European Society of Cardiology, Professor Giuseppe Mancina from the University of Milan-Bicocca in Italy says: "In the last few years there has been much attention given to the traits which may in children and adolescents predict what will happen to their cardiovascular system in later life. We now know, for example, that higher blood pressure values in children predict hypertension in adulthood - and this is also the case with other factors, such as excess body weight (even in neonates) and increased heart rate. So early phenotypes must be considered with great attention, and it is interesting in the present study that this includes bone maturation - that is, something apparently unrelated to cardiovascular and metabolic variables.

"The problem behind the findings on hypertension is when to start intervention, since it is now apparent that associated body changes are already present to some degree at an early stage of life. It is also clear that treatment in adult patients cannot normalise the risk, potentially because hypertension-related changes have already become, at least in part, irreversible. So there are grounds for earlier intervention, and serious implementation of lifestyle changes, such as weight control and exercise, appears justified."

More information: Pludowski P, Niemirska A, Sladowska J, et al. Accelerated skeletal maturation in children with primary hypertension. Hypertension 2009; [DOI: 10.1161/HYPERTENSIONAHA.109.139949](https://doi.org/10.1161/HYPERTENSIONAHA.109.139949)

Source: European Society of Cardiology ([news](#) : [web](#))

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