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Journal study highlights:

- *International analysis of data from 50 studies over last four decades looks at tracking blood pressure from childhood to adulthood.*
- *Childhood high blood pressure is associated with adult high blood pressure. Lifestyle modification is preferred treatment rather than medication.*
- *Study suggests early detection of elevated blood pressure, intervention and prevention at a young age is important.*

American Heart Association rapid access journal report:

High blood pressure in kids linked to adult hypertension

DALLAS, June 17 — Higher blood pressure in childhood is associated with higher blood pressure in adulthood, according to the most comprehensive study ever conducted on blood pressure tracking published in *Circulation: Journal of the American Heart Association*.

Researchers examined data from 50 studies, done over four decades in different countries, population groups, ages and durations. These studies provided approximately 600 data points (tracking correlation coefficients) for systolic and diastolic blood pressure, respectively, which were used for analysis in this new study.

“Our meta-analysis reinforces the concept that blood pressure tracks from childhood to adulthood and that elevated blood pressure in childhood is likely to help predict adult hypertension,” said Youfa Wang, M.D., Ph.D., co-author of the study and associate professor of international health and epidemiology in the Center for Human Nutrition, Department of International Health, Bloomberg School of Health at Johns Hopkins University in Baltimore, Md.

“A main finding of our study is that there are large variations in the degree of blood pressure tracking between childhood and adulthood reported in previous studies, while our pooled analysis of the related results shows a moderate tracking,” Wang said. “Among several factors that we examined, the two most important factors that affect the degree of tracking are the children’s age when they had their blood pressure measured and the length of the follow-up. The later it is measured and the shorter the follow-up, the stronger the tracking.”

Researchers only found very small gender differences. Boys and girls who have high blood pressure in childhood are similarly likely to have higher blood pressure in adulthood.

Wang said good evidence also suggests a strong association between overweight in childhood and elevated blood pressure.

Researchers used sophisticated analytic tools in their meta-analysis. The blood pressure tracking coefficients varied from -0.12 to 0.80 for systolic blood pressure and -0.16 to 0.70 for diastolic blood pressure, with the tracking in systolic blood pressure being stronger than that of diastolic blood pressure: the average of the tracking coefficients was 0.38 vs. 0.28 . The values of the tracking (correlation) coefficients range between -1 and 1 ; the higher the coefficient, the stronger the tracking.

“There is a stronger association between higher blood pressure in adolescents when they become adults compared to higher blood pressure in younger children,” Wang said.

The study found systolic blood pressure measured in childhood is a better and stronger predictor of blood pressure in adulthood than diastolic pressure, which at least partially is because of the many difficulties in measuring diastolic pressure in children.

Wang said he was surprised the study found few significant differences in the strength of blood pressure tracking in the population groups from the United States, Europe and Asia. The study found blood pressure tracking from childhood to adulthood in African Americans was similar to that observed in white Americans. Fifty-eight percent of published studies were from the United States; 22 percent from Europe; and 6 percent from Asia.

“Early detection and intervention is important to overcoming high blood pressure,” Wang said. “Lifestyle modification is preferred rather than medication when appropriate to help young people to control their elevated blood pressure to a desirable level. A healthy diet and adequate exercise can also help reduce the risks of developing many other chronic diseases such as obesity, type 2 diabetes, metabolic syndrome, and cardiovascular disease.”

Based on recent guidelines, prehypertension is defined as systolic blood pressure higher than 120 millimeters of mercury (mmHg) but lower than 140 mmHg, or a diastolic pressure greater than 80 mmHg but lower than 90 mmHg, or both. Hypertension is defined as a systolic blood pressure greater than 140 mmHg or a diastolic blood pressure greater than 90 mmHg.

In children and adolescents, blood pressure normally rises with age and varies by gender and height. Thus, a child's blood pressure will be compared to his or her sex, age and height matched blood pressure percentiles to see whether the child has elevated blood pressure, Wang said.

In another study based on nationally representative data, Wang’s team found that in 1999-2000 approximately 37.4 percent of American adults had prehypertension, 33.6 percent had hypertension and some population groups were disproportionately affected. The prevalence of hypertension has increased by about 10 percentage points over the past decade. At least part of the increase is due to the rising obesity epidemic, Wang said.

The American Heart Association estimates that 73 million people in the United States age 20 and older have high blood pressure, a serious condition that can lead to heart disease, heart failure, stroke, kidney failure and other health problems.

Children, even very young babies, can have high blood pressure. The American Heart Association recommends that all children age 3 and older have yearly blood pressure measurements. Early detection of high blood pressure will improve the healthcare of children.

The first author is Xiaoli Chen, M.D., Ph.D., a former postdoctoral fellow at the Johns Hopkins University Bloomberg School of Public Health.

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