Abnormal levels of uric acid in teens linked to high blood pressure

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Teens with high levels of uric acid appear to be at increased risk for high blood pressure, according to results of research from scientists at the Johns Hopkins Children's Center.

Although the findings do not establish a cause-and-effect link between uric acid and high blood pressure, they point to uric acid as one potential mechanism, or at least a biomarker, of disease, the researchers report in the April issue of the journal Hypertension.

Analyzing more than 6,000 medical records of children, ages 12 through 17, from a national databank, the scientists say they found that teenagers with abnormally high levels of uric acid in their blood were, on average, twice as likely to have high blood pressure as those with normal levels. The investigators warn that a single episode of high blood pressure does not necessarily mean hypertension. Elevated blood pressure on three consecutive visits to the doctor is classified as hypertension.

"High blood pressure is no longer an adult disease and is an increasingly common problem among children today. These findings illuminate one potential pathway in the development of hypertension in the young and suggests a way for detection and treatment," says lead investigator Lauren Loeffler, M.D., M.H.S., a nephrologist at the Johns Hopkins Children's Center.

Uric acid, whose build-up in the body is known to trigger painful gout attacks, has already been implicated in a constellation of adult conditions, ranging from hypertension, heart disease and stroke to diabetes and chronic kidney disease. But the Johns Hopkins team's findings suggest that uric acid may play a role in the genesis of hypertension much earlier in life than previously thought, the researchers say.

"We don't really know whether uric acid drives up blood pressure or merely heralds its onset and progression, but we are excited because our findings add to a growing body of evidence suggesting that uric acid is involved in a wide range of adult diseases that may be rooted in childhood," says senior investigator Jeffrey Fadrowski, M.D., M.P.H., a nephrologist at Johns Hopkins.

In the study population of 6,036, more than 3 percent of teens had high blood pressure, and one-third were overweight or obese. Six percent of the boys and 9 percent of the girls in the study had abnormally high levels of uric acid, defined as 7.7 milligrams per deciliter or higher for males and 5.7 mg/dL or higher for females. Those with elevated blood pressure had, on average, higher levels of uric acid (5.6 mg), compared with those who had normal blood pressure (5 mg), and blood pressure increased as uric acid levels went up. For each bump in 0.1 mg/dL in uric acid level, the likelihood of high blood pressure increased by 55 percent in males and by 17 percent in females, the researchers note.

In addition, the link between elevated blood pressure and high uric acid persisted even after the researchers accounted for factors that can affect blood pressure including diabetes, high cholesterol, high body-mass index and smoking. This finding suggests that uric acid may be an independent driver of high blood pressure, the researchers say.

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