

# High levels of uric acid may be associated with high blood pressure

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Reducing levels of uric acid in blood lowered blood pressure to normal in most teens in a study designed to investigate a possible link between blood pressure and the chemical, a waste product of the body's normal metabolism, said researchers at Baylor College of Medicine in a report that appears in the current issue of the *Journal of the American Medical Association*.

"If you reduce uric acid, at least in some patients, you may be able to reduce blood pressure," said Dr. Daniel Feig, associate professor of pediatrics-renal at BCM and chief of the pediatric hypertension clinics at Texas Children's Hospital. "This could be one way people develop hypertension and may allow us to develop new therapies."

Understanding how people develop high blood pressure gives scientists new tools for understanding the disorder and developing drugs to prevent and treat it.

Uric acid builds up when the body makes too much of it or fails to excrete it. It is a waste product resulting from the metabolism of food. Too much uric acid can cause gout, which occurs when uric acid crystals accumulate in the joints. In this study, researchers used allopurinol to reduce high uric acid levels. Allopurinol is usually used to treat gout, but Feig said its potential side effects rule it out as a treatment for high blood pressure.

In the *JAMA* study, Feig and his colleagues treated teens with newly

diagnosed high blood pressure and elevated levels of uric acid in their blood with allopurinol. In the study, half of the 30 teen-agers with newly diagnosed high blood pressure and higher than normal levels of uric acid in their blood underwent treatment with allopurinol twice a day for four weeks. The other half received a placebo (an inactive drug) on the same schedule. They then went without either drug for two weeks before receiving the opposite treatment for another four weeks.

The treatment not only reduced uric acid levels, it also reduced blood pressure in most of the teens, said Feig. In fact, he said, blood pressures decreased to normal in 20 of the 30 teens when they were on allopurinol. By contrast, only 1 of the 30 teens had normal blood pressure when receiving placebo.

"This is far from being a reasonable therapeutic intervention for high blood pressure, but these findings indicate a first step in understanding the pathway of the disease," said Feig. "You cannot prevent a disease until you know the cause. This study is way of finding that out."

Studies in rats had indicated previously that high levels of uric acid could be associated with the development of high blood pressure through a proven pathway, said Feig. However, he and his colleagues needed to determine if this was true for humans as well.

"The antihypertensive therapies available to patients are well proven and safe," said Feig. "Currently available antihyperuricemic therapies (treatments that lower uric acid) are not safe enough to be used as first line therapy for most people with high blood pressure."

Side effects could include nausea, diarrhea, vomiting, liver problems and even a very rare, potentially life-threatening reaction known as Steven-Johnson syndrome. While only 1 in 3,000 people develop this problem, the risk is too great to prescribe the drug on a routine basis to people

with high blood pressure, a problem that affects 30 to 35 percent of adults.

Currently available therapies are effective but are not solving the problem in everyone. Optimal blood pressures are achieved in only 40 percent of people who are treated for the problem. Understanding the cause of high blood pressure could lead to better treatments and even methods of prevention.

Animal studies indicate that early in the disease, the extra uric acid activates the renin angiotensin system of the body, shrinking key blood vessels and causing high blood pressure. Eventually, however, the small vessels in the kidney are permanently affected, making the blood pressure sensitive to salt or sodium. Too much salt causes the pressure to rise.

Source: Baylor College of Medicine

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