

High-sugar diet increases men's blood pressure; gout drug protective

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A high-fructose diet raises blood pressure in men, while a drug used to treat gout seems to protect against the blood pressure increase, according to research reported at the American Heart Association's 63rd High Blood Pressure Research Conference.

"This is the first evidence of a role of fructose in raising <u>blood pressure</u> and a role for lowering uric acid to protect against that blood pressure increase in people," said Richard Johnson, M.D., co-author of the study and professor and head of the division of Renal Diseases and Hypertension at the University of Colorado-Denver medical campus in Aurora, Colo.

In the study, excessive fructose consumption seemed to increase new onset of metabolic syndrome, a cluster of risk factors associated with the development of cardiovascular disease and type 2 diabetes. On the other hand, the gout drug seemed to halt it — most likely by lowering uric acid, which affects blood pressure.

Fructose, one of several dietary sugars, makes up about half of all the sugar molecules in table sugar and in high-fructose corn syrup, a sweetener often used in packaged products because it's relatively cheap and has a long shelf life. Glucose makes up the other half. Fructose is the only common sugar known to increase uric acid levels.

Patients with high blood pressure, diabetes and <u>kidney disease</u> often have high uric acid levels and gout. But all the ways in which those



conditions might contribute to the development or worsening of the others isn't completely understood, Johnson said.

Johnson and co-author Santos Perez-Pozo, M.D., a nephrologist at Mateo Orfila Hospital in Minorca, Spain who led the study, evaluated 74 adult men, average age 51, who consumed a diet that included 200 grams (g) of fructose per day in addition to their regular diet. The amount is much higher than the estimated U.S. daily intake of 50 g to 70 g of fructose consumed by most U.S. adults. Half of the men were randomly assigned to get the gout drug allopurinol and the other half acted as controls.

After only two weeks on the diet, the high-fructose plus placebo group experienced significant average blood pressure increases of about 6 millimeters of mercury (mm Hg) in systolic blood pressure (the pressure when the heart beats) and about a 3 mm Hg rise in diastolic blood pressure (the pressure between heartbeats). They were measured with strap-on monitors that record blood pressure periodically around the clock.

In contrast, men on the high-fructose diet plus allopurinol had significantly lower uric acid levels and virtually no increase in systolic blood pressure (only 1 mm Hg). The blood pressure levels of most of the men returned to normal within two months of the study's conclusion when the participants returned to their normal dietary intake, Johnson said.

The study also found changes in the incidence of metabolic syndrome. The United States and the international community define the syndrome slightly differently, so researchers used both criteria in the study. In general, metabolic syndrome is defined as having three or more of these five risk factors:



- Increased waist circumference;
- High triglyceride levels;
- Low levels of high-density lipoprotein (HDL), a component of total cholesterol thought to have a protective effect;
- <u>High blood pressure</u>; and
- High fasting blood sugar.

After just two weeks, the incidence of metabolic syndrome more than doubled in the men who consumed a heavy fructose diet and took the placebo pill. The incidence went from 19 percent at baseline to 44 percent at the study's end, according to the U.S. National Cholesterol Education Program-ATP III (NCEP-ATP III) definition, and from 25 percent to 58 percent under the International Diabetes Federation (IDF) definition.

Among men consuming fructose plus allopurinol, virtually no change in the rate of metabolic syndrome occurred — perhaps because the gout drug prevented the blood pressure rise associated with increased fructose consumption.

The study should be viewed as a pilot and more investigations are needed before doctors consider lowering uric acid in the clinical setting, said Johnson, noting that allopurinol can have rare but serious side effects.

Men in both groups had an increase in fasting triglycerides and an indication of insulin resistance by a method called homeostatic model assessment (HOMA), while on the increased fructose diet. The HOMA method is used to quantify insulin resistance and beta-cell function. Allopurinol treatment appeared to lower low-density lipoprotein



cholesterol (LDL), a component of total blood cholesterol linked to the development of cardiovascular disease, compared to placebo, the researchers reported.

"These results suggest that fructose may be a cause of metabolic syndrome," Johnson said. "They also suggest that excessive fructose intake may have a role in the worldwide epidemic of obesity and diabetes."

Fruit, which has just 4 g to 10 g of fructose per serving, also contains many beneficial substances including antioxidants, vitamin C, potassium and fiber that are believed to counter the effects of fructose alone. The main risk for excessive fructose consumption in the Western diet comes from sweetened drinks and foods rich in sugar or high fructose corn syrup, he said.

"When you give fructose to animals, they absolutely develop every feature of metabolic syndrome: they get abdominal fat, high triglycerides, low HDL, their blood pressure goes up and they get insulin resistance," Johnson said. "However, you must give massive amounts of fructose to rats to raise uric acid levels, because rats and most other animals have an enzyme that breaks down uric acid. Humans lack that enzyme. It turns out humans get gout but other animals don't."

If you inhibit the enzyme in rats that breaks down uric acid, it takes only a small amount of <u>fructose</u> to cause uric acid to rise and the symptoms of <u>metabolic syndrome</u> to appear in the animals, he said.

Source: American Heart Association (<u>news</u> : <u>web</u>)

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