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Grapes reduce risk factors for heart disease and diabetes, animal study shows

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Could eating grapes slow what's for many Americans a downhill sequence of high blood pressure and insulin resistance leading to heart disease and type 2 diabetes?

Scientists at the University of Michigan Health System are teasing out clues to the effect of grapes in reducing risk factors related to cardiovascular disease and metabolic syndrome. The effect is thought to be due to phytochemicals -- naturally occurring antioxidants - that grapes contain.

Findings from a new animal study will be presented today at the Experimental Biology convention in Anaheim, Calif., and show encouraging results of a grape-enriched diet preventing risk factors for metabolic syndrome, a condition affecting an estimated 50 million Americans and is often a precursor to type 2 diabetes.

Researchers studied the effect of regular table grapes (a blend of green, red and black grapes) that were mixed into a powdered form and integrated into the diets of laboratory rats as part of a high-fat, American style diet. All of the rats used were from a research breed that is prone to being overweight.

They performed many comparisons between the rats consuming a grape-enriched diet and the control rats receiving no grape powder. Researchers added calories and sugars to the control group to balance the extra calories and sugars gained from getting the grape powder.

After three months, the rats that received the grape-enriched diet had lower blood pressure, better heart function, and reduced indicators of inflammation in the heart and the blood than rats who received no grape powder. Rats also had lower triglycerides and improved glucose tolerance.

The effects were seen even though the grape-fed animals had no change in body weight.

In all, researchers say the study demonstrates that a grape-enriched diet can have broad effects on the development of heart disease and metabolic syndrome and the risk factors that go along with it.

"The possible reasoning behind the lessening of metabolic syndrome is that the phytochemicals were active in protecting the heart cells from the damaging effects of metabolic syndrome. In the rats, inflammation of the heart and heart function was maintained far better," says Steven Bolling, M.D., heart surgeon at the U-M Cardiovascular Center and head of the U-M Cardioprotection Research Laboratory.

The researchers also looked for signs of inflammation, oxidative damage and other molecular indicators of cardiac stress. Again, the rats who consumed the grape powder had lower levels of these markers than rats who did not receive grapes.

There is no well-accepted way to diagnose metabolic syndrome which is really a cluster of characteristics: excess belly fat (for men, a waist measuring 40 inches or more and for women, a waist measuring 35 inches or more); high triglycerides which can lead to plague build-up in the artery walls; high blood pressure; reduced glucose tolerance; and elevated c-reactive protein, a marker for inflammation in the body.

Those with metabolic syndrome are at higher risk for cardiovascular

disease and type 2 diabetes.

But the U-M study suggests that it may be possible that grape consumption can change the downhill sequence that leads to heart disease by prolonging the time between when symptoms begin to occur and a time of diagnosis.

"Reducing these risk factors may delay the onset of diabetes or heart disease, or lessen the severity of the diseases," says E. Mitchell Seymour, Ph.D., lead researcher and manager of the U-M Cardioprotection Research Laboratory. "Ultimately it may lessen the health burden of these increasingly common conditions."

Rats were fed the same weight of food each day, with powered grapes making up 3 percent of the diet. Although the current study was supported in part by the California Table Grape Commission, which also supplied the grape powder, the researchers note that the commission played no role in the study's design, conduct, analysis or preparation of the presentation.

Research on grapes and other fruits containing high levels of antioxidant phytochemicals continues to show promise. U-M will further its research this summer when it begins a clinical trial to test the impact of grape product consumption on heart risk factors.

"Although there's not a particular direct correlation between this study and what humans should do, it's very interesting to postulate that a diet higher in phytochemical-rich fruits, such as grapes, may benefit humans," Bolling says.

Bolling says that people who want to lower their blood pressure, reduce their risk of diabetes or help with weakened hearts retain as much pumping power as possible should follow some tried-and-true advice to

eat a healthy diet low in saturated fat, trans fat and cholesterol, achieve a desirable weight and increase physical activity.

Provided by University of Michigan