

Fructose-sweetened drinks increase nonfasting triglycerides in obese adults

February 12 2009

Obese people who drink fructose-sweetened beverages with their meals have an increased rise of triglycerides following the meal, according to new research from the Monell Center.

"Increased triglycerides after a meal are known predictors of cardiovascular disease," says Monell Member and study lead author Karen L. Teff, PhD, a metabolic physiologist. "Our findings show that fructose-sweetened beverages raise triglyceride levels in obese people, who already are at risk for metabolic disorders such as cardiovascular disease and diabetes."

Triglycerides are manufactured by the body from dietary fat and are the most common form of fat transported in blood. Although normal levels of triglycerides are essential for good health, high levels are associated with increased risk for atherosclerosis and other predictors of cardiovascular disease.

In the study, published online by the *Journal of Clinical Endocrinology and Metabolism*, Teff and her collaborators studied 17 obese men and women. Each was admitted two times to the Clinical and Translational Research Center at the University of Pennsylvania. On each admission, the subjects were given identical meals and blood was collected from an intravenous catheter over a 24-hour period. The only difference was the sweetener used in the beverages that accompanied the meals; beverages were sweetened with glucose during one admission and with fructose during the other.

Blood triglyceride levels were higher when subjects drank fructose-sweetened beverages with their meals compared to when they drank glucose-sweetened beverages. The total amount of triglycerides over a 24-hour period was almost 200 percent higher when the subjects drank fructose-sweetened beverages.

Although fructose increased triglyceride levels in all of the subjects, this effect was especially pronounced in insulin-resistant subjects, who already had increased triglyceride levels. Insulin resistance is a pre-diabetic condition often associated with obesity.

"Fructose can cause even greater elevations of triglyceride levels in obese insulin-resistant individuals, worsening their metabolic profiles and further increasing their risk for diabetes and heart disease," said Teff.

Fructose and glucose are forms of sugar found in both table sugar (sucrose) and high fructose corn syrup. Both fructose and glucose are present in lower concentrations in many fruits and vegetables. Although fructose tastes much sweeter than either glucose or sucrose, it typically is not used alone as a sweetener.

Future work will seek to determine how much fructose is needed to cause an increase of triglyceride levels when it is combined with glucose in beverages. Additional studies will explore the metabolic and health effects of long-term fructose intake.

Source: Monell Chemical Senses Center

Citation: Fructose-sweetened drinks increase nonfasting triglycerides in obese adults (2009, February 12) retrieved 9 May 2023 from <https://medicalxpress.com/news/2009-02-fructose->

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