Medical Xpress

Cocoa could be a healthy treat for diabetic patients

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For people with diabetes, sipping a mug of steaming, flavorful cocoa may seem a guilty pleasure. But new research suggests that indulging a craving for cocoa can actually help blood vessels to function better and might soon be considered part of a healthy diet for the prevention of cardiovascular disease.

Flavanols, natural plant compounds also found in tea, red wine, and certain fruits and vegetables, are responsible for cocoa's healthful benefits. In fact, according to new research published in the June 3 issue of the *Journal of the American College of Cardiology*, after diabetic patients drank specially formulated high-flavanol cocoa for one month, blood vessel function went from severely impaired to normal.

The improvement was as large as has been observed with exercise and many common diabetic medications, the researchers noted. These findings suggest that it may be time to think not just outside the box, but inside the cup, for innovative ways to ward off cardiovascular disease—the number one cause of death in diabetic patients.

"Medical treatments alone often do not prevent complications of diabetes that are associated with atherosclerosis and cardiovascular disease," said Malte Kelm, M.D., a professor and chairman of cardiology, pulmonology and vascular medicine at the University Hospital Aachen and the Technical University Aachen, in Aachen, Germany. "Physicians should be increasingly looking to lifestyle changes and new approaches to help in addressing the cardiovascular risks

associated with diabetes."

For the study, Dr. Kelm and his colleagues first tested the feasibility of using high-flavanol cocoa to improve cardiovascular health by observing, on three separate days, the effects of cocoa with varying amounts of flavanols on blood vessel function in 10 patients with stable type 2 diabetes.

The second, larger part of the study tested the effectiveness of long-term, routine consumption of high-flavanol cocoa in comparison with low-flavanol cocoa in 41 patients with stable type 2 diabetes. Patients were randomly assigned to drink cocoa with either 321 mg of flavanols per serving or only 25 mg of flavanols per serving three times daily for 30 days. The two types of cocoa tasted and looked the same, despite differences in flavanol content. In addition, neither patients nor investigators were aware of which type of cocoa each patient had been assigned to drink.

Blood vessel function was tested on the first day before the patients consumed any cocoa and again two hours after drinking the beverage. The test was repeated before and after cocoa consumption on day 8 and day 30.

To gauge the effect of high-flavanol cocoa on blood vessel function, the researchers used a test called "flow-mediated dilation" (FMD), which evaluates the ability of the arteries to expand (dilate) in response to an increase in the demand for blood, oxygen and nutrients. The FMD test involves measuring the diameter of the brachial artery in the upper arm using ultrasound, then inflating a blood pressure cuff on the forearm for several minutes. The squeezing of the blood pressure cuff temporarily starves the forearm muscles of blood and oxygen, causing the body to increase blood flow to those muscles. In healthy people, the inner lining of the arteries, or endothelium, senses the increased blood flow and

sends a chemical signal telling the arteries to expand. In Dr. Kelm's laboratory, a normal FMD response among healthy people the same age as those participating in the study is a 5.2 percent expansion in arterial diameter, on average.

The researchers found that patients with type 2 diabetes had a severely impaired FMD response at the beginning of the study. Before patients consumed any cocoa, the brachial artery expanded by only 3.3 percent, on average. Two hours after drinking high-flavanol cocoa, the FMD response was 4.8 percent.

Over time, those findings improved, however. After patients drank high-flavanol cocoa three times daily for eight days, the average FMD response improved to 4.1 percent at baseline and to 5.7 percent two hours after cocoa ingestion. By day 30, the FMD response had improved to 4.3 percent at baseline and 5.8 percent after cocoa ingestion. All of the improvements were highly statistically significant.

Among patients who consumed low-flavanol cocoa, there were no significant differences in baseline FMD response over time, or in FMD response after cocoa ingestion on days 8 and 30.

FMD measurements can provide valuable information about a person's cardiovascular health. Previous studies have shown that people with an impaired FMD response have an increased risk of heart attack, need for bypass surgery or catheter procedure to open clogged coronary arteries, and even death from heart disease.

Dr. Kelm speculated that cocoa flavanols improve FMD response by increasing the production of nitric oxide, the chemical signal that tells arteries to relax and widen in response to increased blood flow. Relaxation of the arteries takes stress off of the heart and blood vessels.

The high-flavanol cocoa used in this study—which provided many times more flavanols than the typical U.S. dietary intake of 20 to 100 mg daily—is not sold in the supermarket. Dr. Kelm cautioned that the take-home message of the study is not that people with diabetes should guzzle cocoa, but rather, that dietary flavanols hold promise as a way to prevent heart disease.

“Patients with type 2 diabetes can certainly find ways to fit chocolate into a healthy lifestyle, but this study is not about chocolate, and it’s not about urging those with diabetes to eat more chocolate. This research focuses on what’s at the true heart of the discussion on “healthy chocolate”—it’s about cocoa flavanols, the naturally occurring compounds in cocoa,” he said. “While more research is needed, our results demonstrate that dietary flavanols might have an important impact as part of a healthy diet in the prevention of cardiovascular complications in diabetic patients.”

Umberto Campia, M.D., who co-wrote an editorial about the new study in the same issue of JACC, noted that diabetics are an ideal population in which to study the effects of flavanols on arterial function, because high blood sugar damages the endothelium and because these patients have a high risk of cardiovascular disease.

Any therapy that helps the lining of the arteries to function better is potentially important, said Dr. Campia, a research associate with MedStar Research Institute in Washington, D.C.. “The endothelium is one of the largest organs in the body,” he said. “It maintains the health of the arteries and prevents blockages that can cause heart attacks, strokes and limb loss.”

“This study is important and thought-provoking,” he noted. “We now have sizeable evidence that cocoa flavanols have a positive effect on the health of the arteries. This is the foundation we need for doing a much

larger prospective study that looks at the effect of cocoa flavanols not just on endothelial function, but also on the risk of heart attack, stroke, and other serious forms of cardiovascular disease."

Source: American College of Cardiology