

Cocoa flavanols improve vascular and blood pressure measures for coronary artery disease patients

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A new study by UCSF cardiologists and researchers found that high concentrations of cocoa flavanols decrease blood pressure, improve the health of blood vessels and increase the number of circulating blood-vessel-forming cells in patients with heart disease. The findings indicate that foods rich in flavanols - such as cocoa products, tea, wine, and various fruits and vegetables - have a cardio-protective benefit for heart disease patients.

Findings will be published online July 5th and in the July 13, 2010 issue of the *Journal of the American College of Cardiology* (JACC).

Flavanols are phytonutrient compounds that are found naturally in apples, grapes, tea, cocoa and cherries, which account for the antioxidant effect provided by [red wine](#) and [green tea](#). The study found a protective effect from a cocoa drink with 375 mg of flavanols, but according to researchers, a standard or recommended dosage has not yet been defined to achieve optimal health benefit.

The UCSF team has shown for the first time that one of the possible mechanisms of flavanol's benefit is an increase in the circulation of so-called angiogenic cells in the blood. These cells, also known as early [endothelial progenitor cells](#), are critical for the repair process after vascular injury, and perform function and maintenance roles in the endothelium. Endothelium is the thin layer of cells that line the interior

wall of blood vessels.

"Reduced blood vessel function is a hallmark of early development of [coronary artery disease](#)," said cardiologist Yerem Yeghiazarians, MD, senior author, associate professor of medicine, and researcher in the Eli and Edythe Broad Center of Regeneration Medicine and [Stem Cell Research](#) at UCSF. "If we can improve the health and function of damaged blood vessels, heart disease patients will have a better chance of survival."

In 2005, researchers reported that an increased level of circulating angiogenic cells is associated with a decreased risk of death from cardiovascular causes (*New England Journal of Medicine* by Werner, N., et al.)

In the current study, the benefit seen from the two-fold increase in circulating angiogenic cells was similar to that achieved by therapy with statins and with lifestyle changes such as exercise and smoking cessation. The benefit demonstrated with cocoa flavanol therapy occurred in addition to the medical regimen already being taken by study participants.

"Our data support the concept that dietary flavanols at the levels provided - in tandem with current medical therapy - are safe, improve cardiovascular function, and increase circulating angiogenic cells, which have previously been shown to correlate positively with long-term cardiovascular outcomes" said Yeghiazarians. "Long-term trials examining the effects of high-flavanol diets on cardiovascular health and function are warranted, but these early findings help us understand how these compounds impact the function of damaged blood vessels."

The study included 16 coronary artery disease patients aged 64 years (\pm three years) who received a high-flavanol cocoa drink (containing 375

mg of flavanols) twice a day over 30 days and then a nutrient-matched low-flavanol cocoa drink (containing 9mg flavanols) twice a day over 30 days.

The study was randomized, controlled and "masked", meaning both the doctors and patients were prevented from knowing which variation of the cocoa drink a patient was drinking at a given time until after the study was completed. The patients continued taking all regular medications for their underlying heart disease during the study period, including statin medications for lowering the cholesterol levels to recommended goals.

Researchers calculated the outcome of the cocoa intervention using blood pressure readings, ultrasound to measure dilation of the brachial artery, and cell assays to calculate the number and behavior of circulating angiogenic cells. The tests showed a 47 percent improvement in vasodilation, or widening rather than constriction, of the brachial artery in the high-flavanol time period compared to the low-flavanol period. In addition, circulating angiogenic cells increased 2.2-fold and systolic blood pressure decreased among the high-flavanol versus low-flavanol periods.

"This is exciting data," Yeghiazarians added. "Our findings demonstrate that a further increase in endothelial function and improvement in blood pressure can be achieved by complementing standard treatment with a flavanol-rich diet. The 80 million Americans impacted by heart disease may be glad to hear this." Notably, the therapy did not influence fasting glucose levels of study participants. (Fasting glucose is the standard for measuring an individual's blood sugar level to diagnose conditions such as diabetes and heart disease).

Provided by University of California - San Francisco

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