
Objective To investigate the association between chocolate consumption and risk of stroke in men and conduct a meta-analysis to summarize available evidence from prospective studies of chocolate consumption and stroke.

Methods We prospectively followed 37,103 men in the Cohort of Swedish Men. Chocolate consumption was assessed at baseline using a food-frequency questionnaire. Cases of first stroke were ascertained from the Swedish Hospital Discharge Registry. For the meta-analysis, pertinent studies were identified by searching the PubMed and EMBASE databases through January 13, 2012. Study-specific results were combined using a random-effects model.

Results During 10.2 years of follow-up, we ascertained 1,995 incident stroke cases, including 1,511 cerebral infarctions, 321 hemorrhagic strokes, and 163 unspecified strokes. High chocolate consumption was associated with a lower risk of stroke. The multivariable relative risk of stroke comparing the highest quartile of chocolate consumption (median 62.9 g/week) with the lowest quartile (median 0 g/week) was 0.83 (95% CI 0.70-0.99). The association did not differ by stroke subtypes. In a meta-analysis of 5 studies, with a total of 4,260 stroke cases, the overall relative risk of stroke for the highest vs lowest category of chocolate consumption was 0.81 (95% CI 0.73-0.90), without heterogeneity among studies (p = 0.47).

Conclusion These findings suggest that moderate chocolate consumption may lower the risk of stroke.

Effect of cocoa on blood pressure. Karin Reid, Thomas R Sullivan, Peter Fakler, Oliver R Frank, Nigel P Stocks

Flavanols found in cocoa have been associated with blood pressure-lowering properties due to their stimulation of nitric oxide-dependent vasodilation. In this review we assessed the effect of cocoa products on blood pressure in adults when consumed daily for a minimum of two weeks.

Meta-analysis of 20 studies involving 856 mainly healthy participants revealed a small but statistically significant blood pressure-reducing effect of -2.8 mm Hg systolic and -2.2 mm Hg diastolic.

Trials were of short duration, all but one trial were between two and eight weeks long (n=1 of 18 weeks). While a significant effect with trials of two weeks duration (n=9) was evident, it was not with trials of longer duration (n=11). It is not clear whether this result is directly attributable to the trial length or may be due to another factor such as the type of control group used in the shorter trials or the level of blinding of participants to the treatment. While analysis of trials using a flavanol-free control group indicated a significant effect on blood pressure, analysis of trials using a low-flavanol control group did not.

Adverse effects including gastrointestinal complaints and disaste of the trial product were reported by 5% of patients in the active cocoa intervention group and 1% of patients in the control groups.

Although we did further analyses and explored other subgroups for an effect (including by age, body mass index and baseline blood pressure; sugar content of the cocoa product), the results of all subgroup analyses, and any measured association of effect, need to be tested, and confirmed or refuted, in further trials.

The small reduction in blood pressure of about 2.3 mm Hg observed in the pooled trials overall might complement other treatment options and might contribute to reducing the risk of cardiovascular disease. However, we were unable to identify any randomized, controlled trials that tested the effect of long-term daily ingestion of cocoa products on blood pressure and there were no trials that measured an effect on clinical outcomes related to high blood pressure such as heart attacks or strokes.

More trials in which the intake of low flavanol dosages are compared with flavanol-free controls are required to test whether low dosages are effective in reducing blood pressure. In addition, longer term trials are needed to elucidate whether regular consumption of flavanol-rich cocoa products has a beneficial effect on blood pressure and cardiovascular health over time, and whether there are any potential adverse effects of long-term ingestion of cocoa products on a daily basis.


Abstract Several observational and intervention studies have found an inverse association between the risk of cardiovascular disease and the consumption of polyphenol-rich foods and beverages such as cocoa, fruit and vegetables, tea, virgin olive oil and wine. We present here an overview of the latest research on the beneficial effect of dietary polyphenols on blood pressure, focusing on the development of urine markers for an accurate estimation of polyphenol intake. Total polyphenols (TP) excreted in spot urine samples have been successfully used as a biomarker of the consumption, bioavailability and accumulation of TP in a cross-sectional clinical trial. In addition, we describe how the vasoprotective effect of dietary polyphenols has been related to their ability to increase endothelial synthesis of nitric oxide (NO) and endothelium-derived hyperpolarizing factor (EDHF)-mediated responses.

Effect of catechin/epicatechin dietary intake on endothelial dysfunction biomarkers and proinflammatory cytokines in aorta of hyperhomocysteinemic mice. Naft C, Lameth J, Paul JL, Janel N.

Purpose Hyperhomocysteinemia is well recognized as an independent risk factor for the development of premature atherosclerosis. Atherosclerosis, however, may be prevented by polyphenols, potent antioxidant compounds with antiatherogenic properties. Previously, we used cystathionine beta-synthase-deficient mice (Cbs (-/-)) fed a high-methionine diet—a murine model of hyperhomocysteinemia—to show that daily intake of a red wine polyphenolic extract, mainly comprised of catechin and epicatechin, has a beneficial effect on aortic expression of endothelial dysfunction biomarkers and pro-inflammatory cytokines. The aim of the present study was to understand whether catechin and epicatechin, in purified forms, have anti-atherogenic effects in hyperhomocysteinemia.

Methods Cbs (-/-) mice received 50 g of catechin and/or epicatechin daily in drinking water for 1 month. Plasma homocysteine (Hcy) level and aortic expression of several endothelial dysfunction biomarkers (Vcam-1, Icam-1, E-selectin, and Lox-1) and pro-inflammatory cytokines (Tnf-α, Il-6) were assessed.

Results We found that both catechin and epicatechin had a beneficial effect on plasma homocysteine levels and endothelial dysfunction biomarker expression; however, only catechin had a beneficial effect on pro-inflammatory cytokine expression. Further, when both polyphenols were given, a beneficial effect was observed only on pro-inflammatory cytokine expression.

Conclusions Catechin seems to be a more potent anti-atherogenic compound than epicatechin in hyperhomocysteinemia and should be considered as a novel therapeutic approach against endothelial dysfunction induced by this condition.

Metabolomics view on gut microbiota modulation by polyphenol-rich foods. Moro S, Martin FP, Rezzi S.

Abstract Health is influenced by genetic, lifestyle, and diet determinants; therefore, nutrition plays an essential role in health management. Still, the substantiation of nutritional health benefits is challenged by the intrinsic macro- and micronutrient complexity of foods and individual responses. Evidence of healthy effects of food requires new strategies not only to stratify populations according to their metabolic requirements but also to predict and measure individual responses to dietary intakes. The influence of the gut microbiome and its interaction with the host is pivotal to understand nutrition and metabolism. Thus, the modulation of the gut microbiome composition by alteration of food habits has potentialities in health improvement or even disease prevention. Dietary polyphenols are naturally occurring constituents in vegetables and fruits, including coffee and cocoa. They are commonly associated to health benefits, although mechanistic evidence in vivo is not yet fully understood. Polyphenols are extensively metabolized by gut bacteria into a complex series of end-products that support a significant effect on the functional ecology of symbiotic partners that can affect the host physiology. This review reports recent nutritional metabolomics inspections of gut microbiota-host metabolic interactions with a particular focus on the cometabolism of cocoa and coffee polyphenols.