

Eat Even More Vegetables and Fruits to Protect Your Heart

The manifestations of atherosclerotic cardiovascular disease (CVD), the main cause of morbidity and mortality worldwide, range from subclinical myocardial damage to end-stage heart failure. At present, persuasive evidence exists that a healthy lifestyle, particularly a healthy diet, is the cornerstone of maintaining and improving cardiovascular health (1). Among dietary patterns beneficial for cardiovascular health, those most recommended are the DASH, Mediterranean-style, and vegetarian diets (2). The DASH diet is rich in vegetables, fruits, and low-fat dairy products and includes a moderate amount of whole grains, legumes, nuts, fish, and poultry. The traditional Mediterranean diet includes the same plant-based foods but also emphasizes high consumption of extra-virgin olive oil and moderate consumption of wine. Finally, the vegetarian dietary pattern, although variably described, is by definition rich in plant-based foods. Thus, these 3 healthy dietary patterns are plant-based diets that all entail a high intake of vegetables and fruits.

In their observational analysis, Juraschek and colleagues (3) took advantage of the original data set and stored serum specimens of the DASH clinical trial (4) and compared the effects of the 3 feeding interventions assessed in the study (DASH, fruit-and-vegetable, and typical American diets, with the latter as the control) on serum biomarkers of cardiac damage (high-sensitivity cardiac troponin I [hs-cTnI]), cardiac strain (*N*-terminal pro-B-type natriuretic peptide [NT-proBNP]), and inflammation (high-sensitivity C-reactive protein [hs-CRP]). In fact, hs-cTnI is useful for diagnosing minor myocardial injury in patients with clinical manifestations of atherosclerotic CVD and is an excellent predictor of heart failure hospitalization and cardiac death (5); NT-proBNP has emerged as a hallmark biomarker for the diagnosis and prognosis of heart failure (6); and hs-CRP is a much debated nonspecific marker of systemic inflammation, for which inconsistent results have been found concerning its incremental value in CVD risk prediction (7). This DASH substudy found that after a relatively short 8-week intervention, participants in the DASH and fruit-and-vegetable diet groups had significantly lower concentrations of the biomarkers for myocardial injury (hs-cTnI) and cardiac stress (NT-proBNP), but no changes in hs-CRP levels, compared with the control group (3). As the authors suggest, dietary factors common to both the DASH and fruit-and-vegetable diets, such as higher amounts of potassium, magnesium, and fiber, may partly explain the observed effects.

High intake of fruits and vegetables is the basis of a healthy diet, and almost all medical and nutrition societies, as well as governments, recommend eating these foods daily to reduce the risk for CVD and improve overall health. However, the recommendations vary, from up to 400 g/d (5 servings per day) in England to

640 to 800 g/d (around 8 to 10 servings per day) in the United States. In the PREDIMED (Prevención con Dieta Mediterránea) trial, considered as an observational cohort, participants who consumed 9 or more servings of fruits and vegetables per day reduced their incidence of CVD events (myocardial infarction, stroke, or cardiovascular death) by 40% compared with those consuming fewer than 5 servings per day (8). Likewise, a recent meta-analysis of 95 prospective studies concluded that for each 200-g/d (2.5 servings per day) increase in the intake of fruits, vegetables, or fruits and vegetables combined, coronary heart disease risk decreased by 8% to 16%, stroke risk decreased by 13% to 18%, CVD risk decreased by 8% to 13%, and all-cause mortality risk decreased by 10% to 15% (9). When consumption of fruits and vegetables was 800 g/d or greater (≥ 10 servings per day), these risks were reduced by 24%, 33%, 38%, and 31%, respectively. The same meta-analysis found that the foods with the strongest beneficial associations with CVD and mortality were apples and pears, citrus fruits, green leafy vegetables, cruciferous vegetables, tomatoes, and fresh salads. In contrast, intake of canned fruits was associated with an increased risk for CVD and all-cause mortality.

Because many vegetables are cooked for edibility or to enhance palatability, the effects of cooking processes that may alter the bioavailability of nutrients, such as phytochemicals, vitamins, minerals, and fiber, deserve to be mentioned. For instance, evidence exists that slowly simmering vegetables with olive oil in “so-frito” fashion enhances the bioavailability of carotenoids (lycopene) and polyphenols (naringenin, quercetin, and ferulic acid), indicating how the traditional Mediterranean cuisine can contribute to the salutary effects of this dietary pattern (10).

Finally, we should consider the mechanisms by which fruits and vegetables may exert their health effects. Fruits and vegetables contain a myriad of nutrients and phytochemicals, including fiber, polyphenols, carotenoids, potassium, and magnesium, which may act synergistically through several biological mechanisms. Both fruits and vegetables reduce blood pressure, cholesterol, oxidative stress, inflammation, and platelet aggregation, in addition to their beneficial effects on gut microbiota (9). Because the authors of the present study (3) observed no between-diet changes in circulating hs-CRP concentrations, the protective effect on myocardial injury and cardiac stress should be attributed to mechanisms unrelated to inflammation, such as a neutralizing effect on reactive oxygen species and a reduction in DNA damage (9).

In summary, eating fruits and vegetables seems to attenuate subclinical cardiac damage, even in persons in good cardiovascular health, such as those included in the DASH study, furthering our knowledge about the power of food to improve cardiovascular outcomes.

Recommendations to increase the intake of fruits and vegetables to at least 10 servings per day should be generalized to the overall population, regardless of health status.

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