Editorial

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Plant-based diets: what should be on the plate?[1,2]

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Plant-based foods are common staples of traditional diets in the Mediterranean and Asian regions. These diets, despite different amounts of total fat, include large amounts of fruit, vegetables, legumes, whole grains, and nuts and smaller amounts of red meat and refined grains. It is believed that these traditional plant-based diets have contributed to greater longevity and a lower risk of coronary artery disease (CAD) in the Mediterranean and Asian countries than in Western countries (1).

Much experimental and epidemiologic evidence supports the benefits of plant-based foods such as fruit, vegetables, whole grains, and nuts in the prevention of CAD and other chronic diseases (2). In this issue of the Journal, Steffen et al (3) extended available epidemiologic data by assessing the association between these foods and total mortality. They noted inverse associations of whole-grain intake with all-cause mortality and incident CAD. They also observed an inverse association of fruit and vegetable intake with all-cause mortality, but not with CAD or ischemic stroke. The authors also explored the potential mechanisms for the observed associations by including several lipids and obesity variables that could be intermediate factors in the causal pathway; however, the inclusion of these potential confounding factors in the analyses did not reduce the risk estimates. This suggests that the benefits of whole grains and fruit and vegetables go beyond their possible role in modulating those intermediate risk factors.

Also of interest in their study are the apparent differential effects of refined grains in the whites and the African Americans: a positive association was observed in the latter, whereas no association was seen in the former. Prospective data about African Americans are extremely scant because many cohort studies include only a small number of minority subjects. The Atherosclerosis Risk in Communities (ARIC) Study has the advantage of including a large number of African Americans, thus making analysis of this subgroup statistically meaningful. These results may point to glycemic load as the mediating factor. The African Americans in the ARIC Study consumed on average one-third more refined grains than did the whites. The authors noted a higher consumption of foods with a high glycemic index, such as white bread, refined-grain cereals, and biscuits, among the African Americans than among the whites. A diet with a high glycemic load has been shown to adversely affect serum lipids (2) and has been implicated in CAD (4). One strategy for reducing dietary glycemic load is to replace refined grains with whole grains and legumes.

Although animal products are a major source of fat, a plant-based diet is not necessarily low in total fat. Compared with complex carbohydrates, polyunsaturated and monounsaturated fats from plant oils improve serum lipid profiles (2). Epidemiologic studies and dietary intervention trials have shown that substituting unsaturated fats for saturated and *trans* fats in the diet is more effective in lowering the risk of CAD than is simply reducing the total amount of fat (2). However, a plant-based diet does not need to exclude all animal products, unless a strict vegetarian diet is desired. Moderate amounts of fish, poultry, and low-fat dairy products fit well into a nutritionally balanced diet. Consumption of a diet that was high in fruit and vegetables, whole grains, fish and poultry, and low-fat dairy products had a significant inverse association with the risk of CAD (5). In addition, consumption of a diet that was high in red and processed meats, refined grains, high-fat dairy products, sweets, and desserts had a significant positive association with colon cancer and CAD (5, 6), which testifies to the importance of not relying on these foods as major sources of nutrients and energy.

The optimal amount of protein in the diet remains controversial. Substituting animal or plant protein for carbohydrates increases HDL concentrations and decreases triacylglycerol concentrations (7, 8), and, relative to animal protein, soy protein has modest cholesterol-lowering effects (9). A moderately high consumption of protein (24% of energy from protein) is associated with a decreased risk of CAD (10). Thus, a diet with a moderate amount of protein (20–25%) may be desirable. Plant-based foods such as nuts, soybean, and legumes are important sources of protein.

Cumulative evidence supports the great potential of diets that are primarily based on minimally processed plant foods to lower the risks of chronic diseases. The benefits are probably due to the ample amounts of essential fatty acids (both n−3 and n−6), amino acids, fiber, minerals, antioxidant vitamins, and phytochemicals in these diets. However, no single diet is optimal for everyone. Instead, various options are open for designing a palatable and healthy plant-based diet, with varying amounts of fat and carbohydrates, as long as the diet includes healthy types of fat and carbohydrates and provides an appropriate balance between energy intake and energy expenditure.

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