



NUTRITIONAL UPDATE FOR PHYSICIANS: PLANT-BASED DIETS

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ABSTRACT

The objective of this article is to present to physicians an update on plant-based diets. Concerns about the rising cost of health care are being voiced nationwide, even as un-healthy lifestyles are contributing to the spread of obesity, diabetes, and cardiovascular disease. For these reasons, physicians looking for cost-effective interventions to improve health outcomes are becoming more involved in helping their patients adopt healthier lifestyles. Healthy eating may be best achieved with a plant-based diet, which we define as a regimen that encourages whole, plant-based foods and discourages meats, dairy products, and eggs as well as all refined and processed foods.

KEYWORD: present to physicians an update on plant-based diets cholesterol levels consider.

Introduction

In the HBO documentary *The Weight of the Nation*, it was noted that if you “go with the flow” in the US, you will eventually become obese.¹ In 2011, Witters reported that in some areas of the country, the rate of obesity is 39% and is increasing at a rate of 5% per year.² Risks of obesity, diabetes, hypertension, and cardiovascular disease, along with their ensuing complications (eg, behavioral health and quality-of-life problems) often go hand-in-hand and are strongly linked to lifestyle, especially dietary choices.³ Of all the diets recommended over the last few decades to turn the tide of these chronic illnesses, the best but perhaps least common may be those that are plant based.

Definitions of Plant-Based Diets

The presented case is a dramatic example of the effect a plant-based diet can have on biometric outcomes like blood pressure, diabetes, and lipid profile. The reduction in HbA1C from 11.1% to 6.3% in 3 months is much better than would be expected with immunotherapy with metformin or daily exercise. The improvement in blood pressure observed over a 4-month period with few medications is also rarely encountered in clinical practice and is likely related to a low-sodium diet and the avoidance of red meat. Because the patient was not obese and did not have significant weight loss with the diet, the dramatic improvements appear to be related to the quality of his new diet.

A healthy, plant-based diet aims to maximize consumption of nutrient-dense plant foods while minimizing processed foods, oils, and animal foods (including dairy products and eggs). It encourages lots of vegetables (cooked or raw), fruits, beans, peas, lentils, soybeans, seeds, and nuts (in smaller amounts) and is generally low fat. Leading proponents in the field have varying opinions as to what comprises the optimal plant-based diet. Ornish et al recommends allowing animal products such as egg whites and skim milk in small amounts for reversal of disease.

Esselstyn, who directs the cardiovascular prevention and reversal program at the Cleveland Clinic Wellness Institute, recommends completely avoiding all animal based products as well as soybeans and nuts, particularly if severe coronary artery disease is present.

Despite these smaller differences, there is evidence that a broadly defined plant-based diet has significant health benefits. It should be noted that the term plant-based is sometimes used interchangeably with vegetarian or vegan. Vegetarian or vegan diets adopted for ethical or religious reasons may or may not be healthy. It is thus important to know the specific definitions of related diets and to ascertain the details of a patient's diet rather than making assumptions about how healthy it is. The following is a brief summary of typical diets that restrict animal products. A key distinction is that although most of these diets are defined by what they exclude, the plant-based diet is defined by what it includes.

Vegan (or total vegetarian): Excludes all animal products, especially meat, seafood, poultry, eggs, and dairy products. Does not require consumption of whole foods or restrict fat or refined sugar.

Raw food, vegan: Same exclusions as veganism as well as the exclusion of all foods cooked at temperatures greater than 118°F.

Lacto-vegetarian: Excludes eggs, meat, seafood, and poultry and includes milk products.

Ovo-vegetarian: Excludes meat, sea-food, poultry, and dairy products and includes eggs.

Lacto-ovo vegetarian: Excludes meat, seafood, and poultry and includes eggs and dairy products.

Mediterranean: Similar to whole-foods, plant-based diet but allows small amounts of chicken, dairy products, eggs, and red meat once or twice per month. Fish and olive oil are encouraged. Fat is not restricted.

Whole-foods, plant-based, low-fat:

Encourages plant foods in their whole form, especially vegetables, fruits, legumes, and seeds and nuts (in smaller amounts). For maximal health benefits this diet limits animal products. Total fat is generally restricted.

Benefits of Plant-Based Diets

The goal of our diet should be to improve our health. In this section, we will review the literature for key articles that demonstrate the benefits of plant-based diets. Our review consists of existing studies that include vegan, vegetarian, and Mediterranean diets.

Obesity

In 2006, after reviewing data from 87 published studies, authors Berkow and Barnard reported in *Nutrition Reviews* that a vegan or vegetarian diet is highly effective for weight loss. They also found that vegetarian populations have lower rates of heart disease, high blood pressure, diabetes, and obesity. In addition, their review suggests that weight loss in vegetarians is not dependent on exercise and occurs at a rate of approximately 1 pound per week. The authors further stated that a vegan diet caused more calories to be burned after meals, in contrast to non-vegan diets which may cause fewer calories to be burned because food is being stored as fat.

Diabetes

Plant-based diets may offer an advantage over those that are not plant based with respect to prevention and management of diabetes. The Adventist Health Studies found that vegetarians have approximately half the risk of developing diabetes as non-vegetarians. In 2008 Van get al reported that non-vegetarians were 74% more likely to develop diabetes over a 17-year period than vegetarians. In 2009, a study involving more than 60,000 men and women found that the prevalence of diabetes in individuals on a vegan diet was 2.9%, compared with 7.6% in the non-vegetarians. A low-fat, plant-based diet with no or little meat may help prevent and treat diabetes, possibly by improving insulin sensitivity and decreasing insulin resistance.

Barnard et al²¹ reported in 2006 the results of a randomized clinical trial comparing a low-fat vegan diet with a diet based on the American Diabetes Association guidelines. People on the low-fat vegan diet reduced their HbA1C levels by 1.23 points, compared with 0.38 points for the people on the American Diabetes Association diet. In addition, 43% of people on the low-fat vegan diet were able to reduce their medication, compared with 26% of those on the American Diabetes Association diet.

Heart Disease

In the Lifestyle Heart Trial, Ornish¹⁰ found that 82% of patients with diagnosed heart disease who followed his program had some level of regression of atherosclerosis. Comprehensive lifestyle changes appear to be the catalyst that brought about this regression of even severe coronary atherosclerosis after only 1 year. In his plant-based regimen, 10% of calories came from fat, 15% to 20% from protein, and 70% to 75% from carbohydrate, and cholesterol was restricted to 5 mg per day.

Interestingly, 53% of the control group had progression of atherosclerosis. After 5 years, stenosis in the experimental group decreased from 37.8% to 34.7% (a 7.9% relative improvement). The control group experienced a progression of stenosis from 46.1% to 57.9% (a 27.7% relative worsening). Low-density lipoprotein had decreased 40% at 1 year and was maintained at 20% less than baseline after 5 years. These reductions are similar to results achieved with lipid-lowering medications.

In the Lyon Diet Heart Study, a prospective, randomized, secondary prevention trial, de Lorgeril found that the intervention group (at 27 months) experienced a 73% decrease in coronary events and a 70% decrease in all-cause mortality. The intervention group's Mediterranean-style diet included more plant foods, vegetables, fruits, and fish than meat. Butter and cream were replaced with canola oil margarine. Canola oil and olive oil were the only fats recommended.

High Blood Pressure

In 2010, the Dietary Guidelines Advisory Committee performed a literature review to identify articles examining the effect of dietary patterns on blood pressure in adults. Vegetarian diets were associated with lower systolic blood pressure and lower diastolic blood pressure.²⁶ One randomized crossover trial found that a Japanese diet (low sodium and plant based) significantly reduced systolic blood pressure.

Mortality

The Dietary Guidelines Advisory Committee also performed a 2010 literature review to determine the effect of plant-based diets on stroke, cardiovascular disease, and total mortality in adults. They found that plant-based diets were associated with a reduced risk of cardio-vascular disease and mortality compared with non-plant-based diets.

Health Concerns about Plant-Based Diets Protein

Generally, patients on a plant-based diet are not at risk for protein deficiency. Proteins are made up of amino acids, some of which, called essential amino acids, cannot be synthesized by the body and must be obtained from food. Essential amino acids are found in meat, dairy products, and eggs, as well as many plant-based foods, such as quinoa. Essential amino acids can also be obtained by eating certain combinations of plant-based foods. Examples include brown rice with beans, and hummus with whole wheat pit. Therefore, a well-balanced, plant-based diet will provide adequate amounts of essential amino acids and prevent protein deficiency.

Soybeans and foods made from soy-beans are good sources of protein and may help lower levels of low-density

lipoprotein in the blood³⁴ and reduce the risk of hip fractures and some cancers.

A study in the Journal of the American Medical Association reported that women with breast cancer who regularly consumed soy products had a 32% lower risk of breast cancer recurrence and a 29% decreased risk of death, compared with women who consumed little or no soy. An analysis of 14 studies, published in the American Journal of Clinical Nutrition, showed that increased intake of soy resulted in a 26% reduction in prostate cancer risk.

Because of concerns over the estrogenic nature of soy products, women with a history of breast cancer should

discuss soy foods with their oncologists. Also, overly processed, soy-based meat substitutes are often high in isolated soy proteins and other ingredients that may not be as healthy as less processed soy products (ie, tofu, tempeh, and soy milk).

Iron

Plant-based diets contain iron, but the iron in plants has a lower bioavailability than the iron in meat. Plant-based foods that are rich in iron include kidney beans, black beans, soybeans, spinach, raisins, cashews, oatmeal, cabbage, and tomato juice.³⁸ Iron stores may be lower in individuals who follow a plant-based diet and consume little or no animal products. However, the American Dietetic Association states that iron-deficiency anemia is rare even in individuals who follow a plant-based diet.

Vitamin B12

Vitamin B12 is needed for blood formation and cell division. Vitamin B12 deficiency is a very serious problem and can lead to macrocytic anemia and irreversible nerve damage. Vitamin B12 is produced by bacteria, not plants or animals. Individuals who follow a plant-based diet that includes no animal products may be vulnerable to B12 deficiency and need to supplement their diet with vitamin

B12 or foods fortified with vitamin B12.

Calcium and Vitamin D

Calcium intake can be adequate in a well-balanced, carefully planned, plant-based diet. People who do not eat plants that contain high amounts of calcium may be at risk for impaired bone mineralization and fractures. However, studies have shown that fracture risk was similar for vegetarians and non-vegetarians. The key to bone health is adequate calcium intake, which appears to be irrespective of dietary preferences. Some significant sources of calcium include tofu, mustard and turnip greens, bok choy, and kale. Spinach and some other plants contain calcium that, although abundant, is bound to oxalate and therefore is poorly absorbed.

Vitamin D deficiency is common in the general population. Plant-based products such as soy milk and cereal grains may be fortified to provide an adequate source of Vitamin D. Supplements are recommended for those who are at risk for low bone mineral density and for those found to be deficient in vitamin D.

Fatty Acids

Essential fatty acids are fatty acids that humans must ingest for good health because our bodies do not synthesize them. Only two such essential fatty acids are known: linoleic acid (an omega-6 fatty acid) and alpha linolenic acid (an omega-3 fatty acid). Three other fatty acids are only conditionally essential: palmitoleic acid (a monounsaturated fatty acid), lauric acid (a saturated fatty acid), and gamma linolenic acid (an omega-6 fatty acid). Deficiency in essential fatty acids may manifest as skin, hair, and nail abnormalities.⁴⁵

The fatty acids that vegans are most likely to be deficient in are the omega-3 fats (n-3 fats). Consumptions of the plant version of omega-3 fats, alpha linolenic acid, are also low in vegans. Adequate intake of n-3 fats is associated with a reduced incidence of heart disease and stroke. Foods that are good sources of n-3 fats should be emphasized. They include ground flax seeds, flax oil, walnuts, and canola oil.

Conclusion

Too often, physicians ignore the potential benefits of good nutrition and quickly prescribe medications instead of giving patients a chance to correct their disease through healthy eating and active living. If we are to slow down the obesity epidemic and reduce the complications of chronic disease, we must consider changing our culture's mind-set from "live to eat" to "eat to live." The future of health care will involve an evolution toward a paradigm where the prevention and treatment of disease is centered, not on a pill or surgical procedure, but on another serving of fruits and vegetables.

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