The Benefits of a Plant-Based Diet and Lifestyle Medicine to Prevent and Treat Heart Disease and Other Chronic Diseases

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Abstract

Despite heart disease being the number one cause of death for more than a century, the standard medical approach has not changed this progression. Clinical research has shown that the development of heart disease can be prevented, arrested and even reversed by changing dietary patterns. High cholesterol, blood pressure, body mass index (BMI), and glucose are all risk factors that are impacted by the foods we consume. Following a plant-based diet can decrease all of these risk factors and substitute healthy macro/micro nutrients and fiber known to reduce risk factors for multiple chronic diseases. Current medical curriculum does not adequately prepare physicians to prescribe and promote a healthy diet. Healthcare professionals can assist their patients diagnosed with heart disease by discussing and prescribing a plant-based diet for their patients. Understanding techniques that encourage patients to make lifestyle changes can result in arresting heart disease, lowering both incidence and prevalence, and providers must be educated in order to fully inform patients of less-invasive treatment options. Lifestyle modification to a plant-based dietary pattern has been shown to save patient lives, reduce healthcare costs and provide the practitioner with job satisfaction seeing patients improve and heal. Patients are more likely to respond to dietary recommendations made by their provider. Knowledgeable healthcare professionals can encourage their patients to follow a plant-based diet by using motivational interviewing techniques and co-creating SMART goals for the patients.

Heart Disease Development

Heart disease refers to hypertension and coronary artery disease (CAD).[1] Many conditions classified as heart disease are related to atherosclerosis,[2] which occurs when lipoproteins, oxidized phospholipids and platelets adhere to artery walls and cause resident endothelial cells to change.[1,3] Eventually, a fibrous cap hardens and narrows the arteries, blocking blood flow and leading to the development of serious and potentially fatal heart disease events such as heart attack, stroke, heart failure, arrhythmias, and heart valve problems.[1–3]

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Lifestyle medicine, including diet modification, can prevent this process and reverse progressive heart disease.[4,5] According to Dr. Balazs Bodai, "a paradigm shift to lifestyle medicine needs urgent implementation."[6] A study in Germany by Dr. Earl S. Ford in 2009 found that not smoking, having a BMI under 30 kg/m^2, performing at least 3.5 hours of physical activity each week and following a healthy diet (high intake of fruits, vegetables, and whole grains, and low in meat) decreased risk of developing chronic diseases like diabetes, myocardial infarction, stroke, and cancer by an average of 78%, demonstrating how much of an impact lifestyle medicine can have on chronic disease.[7]

Insulin resistance, diabetes, and obesity are major risk factors for the development of atherosclerosis.[8] Insulin resistance contributes to diabetes, which generates an abundance of advanced glycation end products (AGEs) that are highly atherogenic.[8] Diabetes also leads to hypertriglyceridemia, reduced HDL cholesterol, increased LDL cholesterol and hypertension, all of which progress atherosclerosis and heart disease development.[8]

Obesity further stimulates heart disease progression. Adipocytes in people with obesity act similarly to macrophage foam cells because their macrophages infiltrate fatty tissue, stimulate cytokine secretion and lead to a pro-inflammatory response.[8]

How a Plant-Based Diet Prevents Heart Disease

The Western diet is high in sugar, salt, cholesterol and fat, which can lead to the development of diabetes, hypertension, hyperlipidemia, obesity, and coronary artery disease.[9] This diet is deficient in fiber, vitamins, minerals and protective phytonutrients.[10] A transition to a whole-food, plant-based diet aims to maximize the consumption of nutrient-dense plant foods. This dietary pattern minimizes the consumption of processed foods, added sugars, saturated fats and cholesterol known to increase heart disease progression.

The 2015 BROAD study determined the effects of a low-fat, plant-based diet on BMI, cholesterol, HbA1c, and quality of life.[4] Researchers found there was a statistically significant reduction in total cholesterol, with a mean reduction in total cholesterol of 0.55 mmol at 12 months in the intervention group following the intervention diet.[4] There was a statistically significant reduction in BMI of 4.2 kg/m^2 at 12 months in the intervention group, and no significant reductions in BMI in the control group.[4] The intervention group had an average reduction in HbA1c of 5 $mmol\ mol^{-1}$ from baseline to 12 months.[10] The results of the BROAD study demonstrate that a plant-based diet can reduce BMI, cholesterol and HbA1c, all comorbidity factors associated with heart disease.[11]

A meta-analysis in 2014 quantified the effects of BMI on coronary heart disease and found that 46% of the excess risk of BMI is mediated by blood pressure, cholesterol and blood glucose. High blood pressure accounted for 31% of heart disease risk. Overweight and obesity were also associated with a significant increase in heart disease risk.[11] A plant-based diet can help reduce BMI[4] and blood pressure[5], preventing the development of coronary heart disease.

How Plant-Based Diets Treat Heart Disease

Despite advances in medicine and surgical treatment of heart disease, it remains the leading cause of death in the United States,[9] which may be attributed to the noticeable absence of attention to lifestyle factors. The Lifestyle Heart Trial was the first randomized control trial that studied the effect of lifestyle modifications on coronary artery disease, including a low-fat vegetarian diet and exercise.[5] All participants in the Lifestyle Heart Trial had coronary artery disease. Research results showed a reduction in total cholesterol, LDL cholesterol, systolic and diastolic blood pressure, overall weight, and episodes of angina (chest pain) with the experimental diet.[5]

Adherence to the experimental diet was excellent, signifying that patients will follow a plant-based diet long-term if it is effective in reducing risk factors.[5] The experimental group showed a decrease in average percentage diameter stenosis, whereas the control group showed an increase.[5]

Overall, patients on the experimental low-fat vegetarian diet in the Lifestyle Heart Trial showed a regression of coronary atherosclerosis,[5] demonstrating that a plant-based diet can be used to arrest and reverse coronary artery disease.

The Pritikin study by Nathan Pritikin determined the effects of a primarily plant-based diet and exercise on coronary heart disease outcomes in patients with metabolic syndrome.[12] At the end of the 2-week treatment period, 31% of participants in the study no longer met the criteria for metabolic syndrome.[12] Participants saw a reduction in glucose, systolic and diastolic blood pressure, total cholesterol, LDL cholesterol, BMI and triglycerides.[12] The results of this study demonstrate that even short-term intervention of lifestyle modifications, including adherence to a primarily plant-based diet can treat risk factors of coronary artery disease.[12]

The Right Diet for a Healthy Heart

Risk reduction of heart disease occurs with adherence to a whole-foods, plant-based diet,[13] whereas a less healthy version of a plant-based diet shows a positive association with coronary heart disease.[13] A healthful plant-based diet includes consumption of primarily whole-foods with few processed or packaged foods. A diet high in fiber, antioxidants, unsaturated fat, and micronutrients, and low in saturated fat and heme iron can lead to weight loss or maintenance, improved glycemic control and lipid profiles, decreased blood pressure and inflammation, a more favorable gut microbiome and improved vascular health, all which can contribute to risk reduction of coronary heart disease.[13] Foods in a whole food plant-based diet include fruits, vegetables, 100% whole and intact grains, legumes, raw nuts and seeds.

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Consumption of foods rich in unsaturated fats can help control lipid profiles. Diets high in monounsaturated fats (MUFAs) are associated with lower fat mass, decreased systolic and diastolic blood pressure, increased HDL cholesterol and decreased triglycerides.[14] MUFAs can inactivate sterol regulatory element binding protein (SREBP), which regulates cholesterol synthesis.[14] Replacing saturated fats with MUFAs can reduce total cholesterol, LDL cholesterol and triglycerides, which can reduce risk of heart disease.[14] Olive oil, canola oil, nuts, nut butters, and avocados are good sources of MUFAs.

Omega-3 and omega-6 fatty polyunsaturated fats (PUFAs), can reduce risk of heart attack and coronary heart disease death.[14] Replacing saturated fats with PUFAs has been shown to reduce total cholesterol, LDL cholesterol and triglycerides, potentially reducing the risk of heart disease.[14] Studies show that those in the highest

Heart disease refers to hypertension and coronary artery

quintile of PUFA intake had a 43% reduced risk of sudden cardiac death compared to the lowest quintile.[14] Just one gram per day of the essential omega-3 fatty acid alpha-linolenic acid (ALA) was associated with a 10% lower risk of coronary heart disease death.[14] Flaxseed, tofu, canola oil, pumpkin seeds, chia seeds and walnuts are all good sources of ALA.

AMA 2012 Resolution:
Physicians must "acquire and apply the 15 clinical competencies of lifestyle medicine, and offer evidence-based lifestyle medicine interventions as the first and primary mode of preventing and, when appropriate, treating chronic disease with clinical medicine."

Why Practitioners Should Promote Lifestyle Medicine

There are many benefits to the provider who promotes a plant-based diet for patients with heart disease. Based on clinical trials, we know heart disease can be arrested and reversed by adopting a plant-centered dietary pattern, saving lives and extending longevity and quality of life. Patients can be provided with a non-invasive, low risk treatment option that does not include negative side effects. In fact, side effects are not just neutral but positive. This reduces healthcare costs.

Lifestyle medicine practices which include prescribing a plant-based diet have also been shown to improve job satisfaction and reduce provider burnout. In Jun 2012, The American Medical Association (AMA) adopted a resolution that stated physicians must "acquire and apply the 15 clinical competencies of lifestyle medicine, and offer evidence-based lifestyle medicine interventions as the first and primary mode of preventing and, when appropriate, treating chronic disease with clinical medicine."[15] It is important to note that physicians must fully disclose all treatment options to patients, including lifestyle medicine. According to Dr Dean Ornish, a cardiologist and lifestyle medicine pioneer, lifestyle medicine has 4 components: nutrition, physical activity, stress reduction and rest, and social support systems.[15]

Treating with lifestyle medicine can prevent progression of the disease without serious side effects or invasive treatment.

Most providers are not receiving adequate training in nutrition in medical school. Research shows that 38% of medical schools provide the required minimum 25 hours of nutrition education, and nearly 90% of instructors expressed the need for more nutrition instruction at their school.[16]

With the evidence showing the positive results of treating patients with lifestyle medicine, it falls on the provider to seek out education and board certification in order to effectively treat patients with active heart disease. Treating with lifestyle medicine can prevent progression of the disease without serious side effects or invasive treatment.[6,7]

In 2019, the US health expenditure was up to $3.8 trillion, which accounted for 17.7% of the gross domestic product (GDP).[17] These numbers are projected to increase by 5.5% each year until 2027.[17] US GDP for healthcare spending is greater than 10 of the world's highest income countries.[18] Unfortunately, most healthcare costs are spent on treating disease, and not directed toward lifestyle medicine or prevention. Over 80% of chronic disease could be avoided through lifestyle modifications like diet and exercise.[6]

Workplace wellness programs use lifestyle medicine to access employees at an age that these lifestyle changes can affect their long-term health.[19] The RAND Employer Survey studied how workplace wellness programs impacted employer healthcare costs. Employers in the study stated they found workplace wellness programs reduced medical costs, absenteeism, and health-related productivity losses.[19]

Promoting lifestyle medicine practices can reduce healthcare costs by improving overall health and reducing development of comorbidities like obesity, hypertension and high cholesterol. Healthcare costs for cardiovascular disease are around $70 billion annually, or 17% of total healthcare expenditure.[6] Since research shows adopting a whole food, plant-based diet, can prevent development or reverse cardiovascular disease,[6,7,18] promoting lifestyle changes like diet and exercise, healthcare practitioners can reduce incidence, prevalence and mortality of heart disease. This practice could decrease healthcare costs by millions, or even billions of dollars.[18,20]

How to Prescribe a Plant-Based Diet

Practitioners such as registered dietitians and physicians can increase their patients' likelihood of adhering to a plant-based diet by offering support and appropriate education. By showing empathy and engaging in participatory decision-making with patients, practitioners can build trust with patients.[21]

Using a motivational interviewing counseling style during office visits creates a collaborative conversation with the patient. This can influence patients to take responsibility for creating healthy lifestyle patterns which increases development of permanent behavior changes.[21] The key components of motivational interviewing use the OARS format: open-ended questions, affirming efforts and strengths, reflecting back what you hear, and summarizing what comes from the patient as you go.[21] Using the SMART goals model (Specific, Measurable, Attainable, Relevant, and Time-specific) to prescribe next steps for patients helps them set realistic, achievable goals.[21]

It is wise for practitioners to be prepared to address questions and concerns that patients may have about adopting a plant-based eating pattern, and to provide

options for regular follow-up.[21] Creating opportunity for increased contact time has been shown to result in greater success in creating dietary changes.[21]

At office visits, busy practitioners can create a path for providing ongoing education like holding group appointments or referring to outside resources in order to increase patient engagement in plant-based education.[21] Connecting patients with other patients who are pursuing a plant-based diet can also increase the likelihood of diet adherence because the patients feel supported.[21]

Conclusion

Hundreds of thousands of Americans continue to die from heart disease every year, yet, research clearly demonstrates we can arrest this progression. The Western diet is contributing to the high prevalence of heart disease by increasing inflammation, excess body fat, high blood sugars, high cholesterol and hypertension.

Lifestyle medicine can prevent and lower these risk factors for diet-related chronic diseases. Following a whole-foods, plant-based diet is shown to prevent and reverse the progression of heart disease because of the multiple health benefits of plant foods. Practitioners have an obligation to explain all treatment options to patients, including lifestyle medicine like diet education.

Medical curricula provide training in identifying diseases and prescribing medications or surgery, but do not provide adequate training in nutrition education. Practitioners must personally endeavor to learn the basics of treating with lifestyle medicine through professional development and board certification. This is especially important since treatment with lifestyle medicine has no downsides to the patient or the practice.

Providers can assist their patients by using motivational interviewing techniques and helping patients set SMART goals. Providers who encourage patients to make lifestyle changes, and support them throughout this line of treatment will achieve positive health improvements for their patients and improvements in their own personal job satisfaction.

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