

Case Report A Whole-Food Plant-Based Diet Reversed Angina without Medications or Procedures

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Received 19 December 2014; Accepted 28 January 2015

Academic Editor: Markus Ferrari

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A 60-year-old man presented with typical angina and had a positive stress test. He declined both drug therapy and invasive testing. Instead, he chose to adopt a whole-food plant-based diet, which consisted primarily of vegetables, fruits, whole grains, potatoes, beans, legumes, and nuts. His symptoms improved rapidly, as well as his weight, blood pressure, and cholesterol levels. Plant-based diets have been associated with improved plasma lipids, diabetes control, coronary artery disease and with a reduction in mortality. Adoption of this form of lifestyle therapy should be among the first recommendations for patients with atherosclerosis.

1. Introduction

Cholesterol guidelines [1] highlight lifestyle modification as "a critical component of health promotion and atherosclerotic cardiovascular disease risk reduction." We describe a case that reinforces this sometimes overlooked portion of the guideline's recommendations.

2. Case Report

A 60-year-old man presented to his primary care physician with typical angina. He reported a 1-year history of progressive severe mid-sternal chest discomfort ultimately after walking as little as one-half block, with emotional stress and in cold weather. His mother had coronary artery bypass surgery and his brother had an acute myocardial infarction, both in their early sixties.

An exercise ECG was obtained. The patient exercised for nine minutes on standard Bruce protocol. His angina was reproduced and 1.5 mm horizontal inferoapical ST depressions were noted. He declined invasive testing and he presented to our Cardiac Wellness Program at Montefiore, where he had borderline elevated blood pressure, a body mass index (BMI) of 26 kg/m², elevated lipid levels, and a limited functional capacity secondary to angina (Table 1). He again declined invasive testing and despite a detailed discussion also declined drug therapy, including antiplatelet and cholesterol lowering agents.

Instead, with physician counseling, he chose to adopt a whole-food plant-based diet (WFPB), which consisted primarily of vegetables, fruits, whole grains, potatoes, beans, legumes, and nuts. He described his prior diet as a "healthy" diet of skinless chicken, fish and low-fat dairy with some vegetables, fruits, and nuts. Within a few weeks of lifestyle change his symptoms improved. After four months, his BMI fell from 26 kg/m² to 22 kg/m², his blood pressure normalized, and his LDL (low-density lipoprotein) cholesterol decreased from 158 mg/dL to 69 mg/dL. Previously unable to engage in physical exercise, he could now walk one mile without angina.

His clinical improvement continued and at our most recent visit, two years after initial presentation, he was able to jog more than 4 miles without incident. He remains asymptomatic, off drug therapy for coronary artery disease, and has not required cardiac catheterization.

Measure	September 2012	January 2013	October 2013	September 2014
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Body mass index (kg/m ²)	26	22	21	21
Blood pressure (mmHg)	140/80	112/70	126/72	124/72
Total cholesterol (mg/dL)	234	148	125	138
Triglycerides (mg/dL)	165	155	126	120
HDLc (mg/dL)	43	34	27	36
LDLc (mg/dL)	158	83	73	78
Functional capacity	Walk 1-2 blocks	Walk 1 mile	Jog 2 miles	Jog 4+ miles

TABLE 1: Anthropomorphic, laboratory, and clinical findings by date.

HDLc: high-density lipoprotein cholesterol; LDLc: low-density lipoprotein cholesterol.

3. Discussion

A whole-food plant-based diet improves plasma lipids [2], glycemic control in patients with type 2 diabetes mellitus [3, 4], reduces weight [5] and blood pressure [6–8], improves vascular function [9], may profoundly improve coronary artery disease [10–13], and is associated with reduced mortality [14–17]. Furthermore, a dose-response-like effect has been noted where the greater the adherence to a healthy lifestyle including a WFPB diet the greater the apparent benefit [18], and a growing body of evidence suggests animal based foods may not be optimal for health [19–21].

Our case reinforces these findings and highlights that even in our "modern" Western society such improvements can be achieved without medications or procedures. These results support prior epidemiologic studies which documented the virtual absence of coronary artery disease in plant-based indigenous populations, such as in parts of China [22], a highland population of New Guinea [23], the Tarahumara Indians of Mexico [24] and in South Africa [25]. Furthermore, mortality from atherosclerotic cardiovascular disease decreased when access to animal products was restricted in Norway during World War II and increased as access was returned [26]. Adoption of a plant-based diet is feasible in a real-world setting [11], not associated with markedly increased cost [27], and is successful with proper education and support [28].

4. Conclusion

A whole-food plant-based diet helped reverse angina without medical or invasive therapy. It appears prudent that this type of lifestyle be among the first recommendations for patients with atherosclerosis. Randomized-controlled trials are needed to further investigate this approach.

Conflict of Interests

The authors have no conflict of interests to disclose.

References

 N. J. Stone, J. G. Robinson, A. H. Lichtenstein et al., "2013 ACC/AHA guideline on the treatment of blood cholesterol to reduce atherosclerotic cardiovascular risk in adults: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines," *Circulation*, vol. 129, no. 25, supplement 2, pp. SI–S45, 2014.

- [2] H. R. Ferdowsian and N. D. Barnard, "Effects of plant-based diets on plasma lipids," *The American Journal of Cardiology*, vol. 104, no. 7, pp. 947–956, 2009.
- [3] N. D. Barnard, J. Cohen, D. J. A. Jenkins et al., "A low-fat vegan diet improves glycemic control and cardiovascular risk factors in a randomized clinical trial in individuals with type 2 diabetes," *Diabetes Care*, vol. 29, no. 8, pp. 1777–1783, 2006.
- [4] N. D. Barnard, J. Cohen, D. J. A. Jenkins et al., "A low-fat vegan diet and a conventional diabetes diet in the treatment of type 2 diabetes: a randomized, controlled, 74-wk clinical trial," *The American Journal of Clinical Nutrition*, vol. 89, no. 5, pp. 1588S– 1596S, 2009.
- [5] S. Mishra, J. Xu, U. Agarwal, J. Gonzales, S. Levin, and N. D. Barnard, "A multicenter randomized controlled trial of a plant-based nutrition program to reduce body weight and cardiovascular risk in the corporate setting: the GEICO study," *European Journal of Clinical Nutrition*, vol. 67, no. 7, pp. 718–724, 2013.
- [6] D. J. A. Jenkins, J. M. W. Wong, C. W. C. Kendall et al., "The effect of a plant-based low-carbohydrate ('Eco-Atkins') diet on body weight and blood lipid concentrations in hyperlipidemic subjects," *Archives of Internal Medicine*, vol. 169, no. 11, pp. 1046– 1054, 2009.
- [7] J. McDougall, L. E. Thomas, C. McDougall et al., "Effects of 7 days on an ad libitum low-fat vegan diet: the McDougall Program cohort," *Nutrition Journal*, vol. 13, no. 1, article 99, 2014.
- [8] G. Fraser, S. Katuli, R. Anousheh, S. Knutsen, P. Herring, and J. Fan, "Vegetarian diets and cardiovascular risk factors in black members of the adventist health study-2," *Public Health Nutrition*, vol. 18, no. 3, pp. 537–545, 2015.
- [9] H. S. Dod, R. Bhardwaj, V. Sajja et al., "Effect of intensive lifestyle changes on endothelial function and on inflammatory markers of atherosclerosis," *The American Journal of Cardiology*, vol. 105, no. 3, pp. 362–367, 2010.
- [10] D. Ornish, S. E. Brown, L. W. Scherwitz et al., "Can lifestyle changes reverse coronary heart disease? The Lifestyle Heart Trial," *The Lancet*, vol. 336, no. 8708, pp. 129–133, 1990.
- [11] C. B. Esselstyn Jr., S. G. Ellis, S. V. Medendorp, and T. D. Crowe, "A strategy to arrest and reverse coronary artery disease: a 5year longitudinal study of a single physician's practice," *Journal* of Family Practice, vol. 41, no. 6, pp. 560–568, 1995.
- [12] C. B. Esselstyn Jr., "Updating a 12-year experience with arrest and reversal therapy for coronary heart disease (an overdue requiem for palliative cardiology)," *The American Journal of Cardiology*, vol. 84, no. 3, pp. 339–341, 1999.

- [13] C. B. Esselstyn, G. Gendy, J. Doyle, M. Golubic, and M. F. Roizen, "A way to reverse CAD?" *The Journal of Family Practice*, vol. 63, no. 7, pp. 356–364, 2014.
- [14] M. J. Orlich, P. N. Singh, J. Sabaté et al., "Vegetarian dietary patterns and mortality in adventist health study 2," *JAMA Internal Medicine*, vol. 173, no. 13, pp. 1230–1238, 2013.
- [15] C. Bamia, D. Trichopoulos, P. Ferrari et al., "Dietary patterns and survival of older Europeans: the EPIC-Elderly Study (European Prospective Investigation into Cancer and Nutrition)," *Public Health Nutrition*, vol. 10, no. 6, pp. 590–598, 2007.
- [16] X. Wang, Y. Ouyang, J. Liu et al., "Fruit and vegetable consumption and mortality from all causes, cardiovascular disease, and cancer: systematic review and dose-response meta-analysis of prospective cohort studies," *The British Medical Journal*, vol. 349, Article ID g4490, 2014.
- [17] Y. Bao, J. Han, F. B. Hu et al., "Association of nut consumption with total and cause-specific mortality," *The New England Journal of Medicine*, vol. 369, no. 21, pp. 2001–2011, 2013.
- [18] S. K. Gupta, R. C. Sawhney, L. Rai et al., "Regression of coronary atherosclerosis through healthy lifestyle in coronary artery disease patients—Mount Abu Open Heart Trial," *Indian Heart Journal*, vol. 63, no. 5, pp. 461–469, 2011.
- [19] K. Michaelsson, A. Wolk, S. Langenskiold et al., "Milk intake and risk of mortality and fractures in women and men: cohort studies," *The British Medical Journal*, vol. 349, Article ID g6015, 2014.
- [20] R. A. Koeth, Z. Wang, B. S. Levison et al., "Intestinal microbiota metabolism of L-carnitine, a nutrient in red meat, promotes atherosclerosis," *Nature Medicine*, vol. 19, no. 5, pp. 576–585, 2013.
- [21] W. H. W. Tang, Z. Wang, B. S. Levison et al., "Intestinal microbial metabolism of phosphatidylcholine and cardiovascular risk," *The New England Journal of Medicine*, vol. 368, no. 17, pp. 1575–1584, 2013.
- [22] T. C. Campbell, B. Parpia, and J. Chen, "Diet, lifestyle, and the etiology of coronary artery disease: the Cornell China study," *The American Journal of Cardiology*, vol. 82, no. 10, pp. 18T–21T, 1998.
- [23] P. F. Sinnett and H. M. Whyte, "Epidemiological studies in a total highland population, Tukisenta, New Guinea. Cardiovascular disease and relevant clinical, electrocardiographic, radiological and biochemical findings," *Journal of Chronic Diseases*, vol. 26, no. 5, pp. 265–290, 1973.
- [24] W. E. Connor, M. T. Cerqueira, R. W. Connor, R. B. Wallace, M. R. Malinow, and H. R. Casdorph, "The plasma lipids, lipoproteins, and diet of the Tarahumara Indians of Mexico," *The American Journal of Clinical Nutrition*, vol. 31, no. 7, pp. 1131– 1142, 1978.
- [25] H. Trowell, N. Painter, and D. Burkitt, "Aspects of the epidemiology of diverticular disease and ischemic heart disease," *The American Journal of Digestive Diseases*, vol. 19, no. 9, pp. 864– 873, 1974.
- [26] A. Strom and R. A. Jensen, "Mortality from circulatory diseases in Norway 1940–1945," *The Lancet*, vol. 1, no. 6647, pp. 126–129, 1951.
- [27] J. A. Hyder, C. A. Thomson, L. Natarajan et al., "Adopting a plant-based diet minimally increased food costs in WHEL study," *American Journal of Health Behavior*, vol. 33, no. 5, pp. 530–539, 2009.
- [28] N. C. Peters, I. R. Contento, F. Kronenberg, and M. Coleton, "Adherence in a 1-year whole foods eating pattern intervention"

with healthy postmenopausal women," *Public Health Nutrition*, vol. 17, no. 12, pp. 2806–2815, 2014.



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