



Diets with customary levels of fat from plant origin may reverse coronary artery disease



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ABSTRACT

The primary cause of death worldwide is heart disease and the most common type of heart disease is coronary artery disease. While coronary artery disease is treated with medications, it responds to lifestyle interventions. A low-fat plant-based diet was designed for reversing coronary artery disease and it is effective in reversing the disease. It has not been tested, however, as far as we know, whether diets with customary levels of fat can also reverse coronary artery disease. Nevertheless, evidence is accumulating to show that atherosclerosis and coronary artery disease are reversed with diets containing customary levels of fat. It has been known that fats of plant origin decrease the risk factors of cardiovascular disease. It is also known that vegans who consume diets with customary levels of fat have the lowest risk of cardiovascular disease. But recent and more specific data show that atherosclerosis was decreased when nuts that are rich in fat were added to a Mediterranean diet while atherosclerosis was increased in the controls. Also, two clinical cases show that coronary artery disease was reversed by low-fat plant-based diets that were supplemented with fat-rich foods of plant origin. These data, then, provide evidence that coronary artery disease may be reversed with a diet containing customary levels of fat from plant sources. We hypothesize that coronary artery disease may be reversed by diets with customary levels of fat of plant origin that are low in saturated fat content. This hypothesis needs to be tested by comparing a traditional low-fat plant-based diet with a plant-based diet containing customary levels of fat of plant origin in their effectiveness to reverse coronary artery disease.

Introduction

Heart disease is the leading cause of death in the United States with coronary artery disease (CAD) being the most common type of heart disease and atherosclerosis is the primary pathology of CAD [1]. CAD may be reversed by medications [2–4] or lifestyle [5–10]. The first evidence that diet may reverse CAD was with a clinical case consuming a low-fat, largely plant-based diet [11]. Subsequently, a randomized clinical trial showed that a low-fat vegetarian diet coupled with exercise and stress management reversed CAD without the use of lipid-lowering drugs [6]. The low-fat diets currently used for reversing coronary artery disease are plant-based diets which contain 10–12% of energy from fat [5–10]. The effectiveness of these diets in reversing

CAD has led to the assumption that a low dietary fat level is a means for reversing CAD. However, there is evidence to support the hypothesis that diets with customary levels of fat also reverse CAD. Thus, a low-fat diet may not be an essential feature for reversing CAD. The lines of evidence that we present are the following: (1) Foods of plant origin that are rich in fat protect against cardiovascular disease [12–16]. (2) Vegans consuming diets with customary levels (30–35% of energy as fat) of fat have low risk of cardiovascular disease [17,18]. (3) A Mediterranean diet with added nuts reversed atherosclerosis [19]. (4) CAD was reversed in clinical cases by plant-based diets supplemented with fat-rich foods of plant origin [20,21].

Abbreviations: CAD, coronary artery disease

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Discussion

Lines of evidence for the hypothesis

In the following section we discuss each of the lines of evidence for reversing the pathology of cardiovascular disease by plant-based diets with customary levels of fat.

Fats of plant origin protect against cardiovascular disease

Fat-rich foods of all sources are proscribed by the low-fat therapeutic diets, yet fat-rich foods of plant origin, such as nuts, seeds, olives, and avocados decrease risk factors associated with cardiovascular disease [12–16]. It stands to reason that if we increase the fat level of diets by adding these plant-based fat-rich foods, they will still protect against cardiovascular disease. This, in fact, was the case in the two clinical cases that we present in which low-fat diets supplemented with fat-rich foods reversed coronary artery disease [20,21].

Vegans consuming diets with customary levels of fat have low risk of cardiovascular disease

Vegan diets contain about 30–35% of energy from fat, [22–24] yet vegans have the lowest risk of cardiovascular disease as compared to other dietary groups. So, vegan diets containing customary levels of fat not only protect against cardiovascular disease, [17,18] they also reverse CAD [20,21].

A Mediterranean diet with added nuts reversed atherosclerosis

Atherosclerosis was reversed by a Mediterranean diet supplemented with nuts. This Mediterranean diet contained 30% of energy as fat before supplementing it with nuts [19]. Although nuts increased the total fat content of the diet, they decreased the relative ratio of saturated fat to unsaturated fat. The diet with added nuts was associated with decreasing the thickness of the carotid artery and the volume of the arterial plaque within a year, while these parameters increased during the same time in the control Mediterranean diet group without additional nuts. This study shows that preclinical estimates of atherosclerosis (thickness of the carotid artery and the volume of the arterial plaque) are reversed by a diet that contained over 30% of energy as fat. This study provides evidence to support the hypothesis that CAD is reversed with diets having customary levels of fat.

CAD was reversed in clinical cases by plant-based diets supplemented with fat-rich foods of plant origin

Two recent clinical case reports show that CAD was reversed by diets containing fats of plant origin [20,21]. In one report, CAD was reversed by a low-fat vegan diet that was supplemented with nuts [20]. The dietary fat content was not given, so we do not know from that report the level of dietary fat that is compatible with the reversal of CAD. The subject of the second clinical case [21] consumed a low-fat vegan diet for a week [25]. He then supplemented the diet with nuts and seeds, olives, avocados and minimum amounts of selected vegetable oils [12–16]. The addition of fat-rich foods significantly improved the flavor and satiety value of the diet. The subject experienced remission of CAD symptoms within six months and complete reversal of coronary artery disease when tested 2.5 years after diagnosis [21]. The diet contained 35% of energy from total fat, 16% monounsaturated, 14% polyunsaturated (10% of α -Linoleic acid and 3.7% of α -Linolenic acid) and 5% of energy from saturated fat. In addition, subject's dietary fiber intake was twice the amount compared to recommended levels (56 g vs 25 g, respectively). While the reversal of CAD has not been compared between the low-fat diets and diets with customary levels of fat from plant-based origins, these clinical cases [20,21] are specific evidence that CAD is reversed with diets containing customary levels of selected fat. Thus, low fat in the diet is not essential for reversing CAD by dietary lifestyle.

Dietary component associated with reversing CAD

A low or lower dietary saturated fat content appears as a possible explanation for the reversing of atherosclerosis [19] and CAD [21]. Low-fat plant-based diets, however, are by nature and by design also low in saturated fat. Thus, a low dietary saturated fat content may be a mechanism for reversing CAD by low-fat diets. Therefore, the low saturated fat content of the diet (quality of fat) may be a mechanism for reversing CAD rather than low fat content (quantity of fat).

The low-fat therapeutic diets referred to above are not only low in fat content; they are also plant-based diets which have cardiovascular disease benefits [17,18]. While fat has been considered a key dietary factor to reverse CAD, other dietary components may be significant contributors to reverse it. The low risk of mortality of cardiovascular disease among subjects consuming the Mediterranean diet is attributed to various food groups [26]. The Mediterranean diet, among other things, is composed largely of fruits, vegetables, legumes, whole grains, nuts and olive oil. These food groups are the same groups in whole food vegan and plant-based diets. Thus, these food groups singly or in combination may be involved in reversing CAD by whole food plant-based diets irrespective of their fat content. If these food components are indeed the primary factors in the mechanism for reversing CAD, there should be little difference in the effectiveness of reversing CAD by the fat restricted and the fat unrestricted plant-based diets. If this is so, this could explain why CAD is reversed by plant-based diets having either low or customary levels of selected fat.

Nuts and coronary artery disease

Nuts are a food group that merits particular attention; they are associated with a significantly decreased risk of cardiovascular disease and all-cause mortality [27–29]. It is of interest, therefore, to note that nuts were components of each of the three diets that we present because they reversed CAD with customary levels of fat—the Mediterranean diet with additional nuts, [19] a vegan diet with only nuts [20] or a vegan diet with nuts, seeds, olives, and avocados [21]. The role of nuts in reversing CAD needs further study.

Application of the hypothesis on reversing CAD

The evidence for reversing CAD by diet is focused on research conducted in the United States, but the need for reversing CAD is worldwide. So, the question arises as to how these findings apply to the rest of the world. The customary level of fat in U.S. diets has been around 30–40% of energy as fat since the first report in 1954 comparing non-vegetarians, vegetarians and vegan diets [24,30]. The customary content of fat in the vegan diets that we report and which have the lowest risk of mortality from cardiovascular disease are limited to vegans in the USA and Canada [31]. Their customary levels of fat is 30% and it is 35% for non-vegetarian diets.

There is a wide variation in the fat content of diets around the world. The global Dietary content of saturated fat is 9% of the energy, with a range of 4–24% across 21 global regions [32]. In the same study the content of saturated fat in percent of energy was 13% in Western Europe countries, as compared to 12% in the U.S. Two reports of large studies in Europe Show that the total dietary fat is 32–39% of total energy for non-vegetarian diets and 28–31% for vegan diets [22]. The respective levels for saturated fat are 10–11% for meat-containing diets and 5% for vegan diets. The fat composition of the Mediterranean diet of adolescents in Southern Europe—Spain, Portugal, Italy and Greece—is around 40% of energy as total fat and 13% as saturated fat [33].

This overview of diets worldwide shows that the fat composition of many diets around the world is similar to the fat composition of diets in the United States. So, the customary fat level that reversed CAD in this country (38% of total energy as fat and 5% as saturated fat) [21] it is similar to that in many diets around the world, and particularly to those

in Western Europe. Thus, our hypothesis is applicable to the diets with the customary levels of fat in many countries around the world.

A look into the future

We recognize the major break-through contribution of a diet that reverses CAD without drugs [6,11]. The low-fat, plant-based diet [11] was introduced at a time when dietary recommendations in this country were for lowering the fat intake to 30% of energy as total fat, but the fat level of this therapeutic diet was restricted to a much lower level than was being recommended. Now we provide evidence that diets with customary levels of fat from plant sources may also reverse CAD. Our hypothesis highlights the need to compare the effectiveness of reversing CAD with low-fat diets as compared with diets having customary levels of fat, but low in saturated fat from plant sources. Our long-range goal is to study the whole-foods vegan diet with customary levels of fat that reverses CAD and to understand the role of fat and the numerous other dietary factors of the diet that may positively impact cardiovascular disease.

Our hypothesis that diets with customary levels of fat from plant origin can also be therapeutic in reversing cardiovascular disease is ready for testing; testing with a whole-foods, total plant-based diet to assess its effectiveness in reversing CAD. This diet provides customary levels of fat coming from whole grains, fruits, vegetables, legumes, and fat-rich foods like olives, avocados, raw nuts, seeds, and minimal amounts of vegetable oils. Those foods could significantly increase variety, flavor appeal and satiety value as compared to the more restricted low-fat therapeutic diets. This could attract more individuals to adopt this diet than the fat-restricted diet and still reverse CAD. This, in turn, could have a significant positive effect on public health by reducing the adverse effects of CAD.

Conclusion

While a low-fat diet has been a common practice for reversing CAD through lifestyle interventions, there is now evidence to show that the atherosclerotic process of CAD is reversed by adding nuts to a Mediterranean diet or by using whole-food vegan diets having up to 35% of total energy from fat derived from nuts, and other fat-rich foods of plant origin that are low in saturated fat content. We thus hypothesize, in contrast to current practice, that CAD can be reversed by diets with customary levels of fats of plant origin that are low in saturated fat. This hypothesis needs to be tested by comparing whole-food, plant-based diets low in saturated fat having low or customary levels of total fat.

Conflict of interest

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.mehy.2018.10.027>.

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