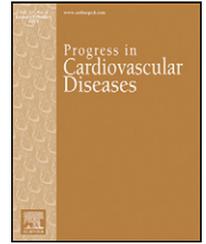


Available online at www.sciencedirect.com

ScienceDirect

www.onlinepcd.com

Benefits of the Mediterranean Diet: Insights From the PREDIMED Study



Miguel A. Martínez-González^{a, b, c, *}, Jordi Salas-Salvadó^{b, c, d}, Ramón Estruch^{b, c, e}, Dolores Corella^{c, f}, Montse Fitó^{c, g}, Emilio Ros^{c, e}, for the PREDIMED INVESTIGATORS¹

^aDepartment of Preventive Medicine and Public Health, University of Navarra, IDISNA (Navarra Health Research Institute), Pamplona, Spain

^bThe PREDIMED Research Network (RD 06/0045), Instituto de Salud Carlos III, Madrid, Spain

^cCentro de Investigación Biomédica en Red Fisiopatología de la Obesidad y Nutrición (CIBERObn), Instituto de Salud Carlos III, Madrid, Spain

^dHuman Nutrition Department, Hospital Universitari Sant Joan, Institut d'Investigació Sanitària Pere Virgili, Universitat Rovira i Virgili, Reus, Spain

^eInstitut d'Investigacions Biomèdiques August Pi i Sunyer, Hospital Clinic, University of Barcelona, Barcelona, Spain

^fDepartment of Preventive Medicine and Public Health, University of Valencia, Valencia, Spain

^gCardiovascular and Nutrition Research Group, Institut de Recerca Hospital del Mar, Barcelona, Spain

ARTICLE INFO

Keywords:

Mediterranean diet
Dietary intervention
Randomized trials
Primary prevention
Atrial fibrillation
Peripheral artery disease
Stroke
Type-2 diabetes

ABSTRACT

The PREDIMED (PREvención con Dieta MEDiterránea) multicenter, randomized, primary prevention trial assessed the long-term effects of the Mediterranean diet (MeDiet) on clinical events of cardiovascular disease (CVD). We randomized 7447 men and women at high CVD risk into three diets: MeDiet supplemented with extra-virgin olive oil (EVOO), MeDiet supplemented with nuts, and control diet (advice on a low-fat diet). No energy restriction and no special intervention on physical activity were applied. We observed 288 CVD events (a composite of myocardial infarction, stroke or CVD death) during a median time of 4.8 years; hazard ratios were 0.70 (95% CI, 0.53–0.91) for the MeDiet + EVOO and 0.70 (CI, 0.53–0.94) for the MeDiet + nuts compared to the control group. Respective hazard ratios for incident diabetes (273 cases) among 3541 non-diabetic participants were 0.60 (0.43–0.85) and 0.82 (0.61–1.10) for MeDiet + EVOO and MeDiet + nuts, respectively versus control. Significant improvements in classical and emerging CVD risk factors also supported a favorable effect of both MeDiets on blood pressure, insulin sensitivity, lipid profiles, lipoprotein particles, inflammation, oxidative stress, and carotid atherosclerosis. In nutrigenomic studies beneficial effects of the intervention with MeDiets showed interactions with several genetic variants (TCF7L2, APOA2, MLXIPL, LPL, FTO, M4CR, COX-2, GCKR and SERPINE1) with respect to intermediate and final phenotypes. Thus, the PREDIMED trial provided strong evidence that a vegetable-based MeDiet rich in unsaturated fat and polyphenols can be a sustainable and ideal model for CVD prevention.

© 2015 Elsevier Inc. All rights reserved.

Statement of Conflict of Interest: see page 56.

* Address reprint requests to Miguel Á. Martínez-González, MD, MPH, PhD. Department of Preventive Medicine & Public Health, School of Medicine, University of Navarra, Irunlarrea 1, 31008-Pamplona, Navarra, Spain.

E-mail address: mamartinez@unav.es (M.A. Martínez-González).

¹ A complete list of PREDIMED INVESTIGATORS can be found at the end of this manuscript.

<http://dx.doi.org/10.1016/j.pcad.2015.04.003>

0033-0620/© 2015 Elsevier Inc. All rights reserved.

Abbreviations and Acronyms

AF = atrial fibrillation
CHD = coronary heart disease
CV = cardiovascular
CVD = CV disease
DLP = dyslipidemia
EVOO = extra-virgin olive oil
FFQ = food frequency questionnaire
HTN = hypertension
MeDiet = Mediterranean diet
MetS = metabolic syndrome
PAD = peripheral artery disease
PREDIMED = PREvención con Dieta MEDiterránea
RCT = randomized control trial
T2DM = type 2 diabetes mellitus

Cardiovascular (CV) disease (CVD) is the main cause of worldwide premature mortality. Coronary heart disease (CHD) and stroke ranked first and third, respectively, as the leading global causes of disability-adjusted years according to the global burden of disease estimates for 2010.¹ Furthermore, the projections of mortality from CVD for 2030 are dismal^{2,3} and underline the need for preventive strategies as a public health priority. In this context, a high-quality diet and a healthy lifestyle at middle age are the most important factors for CVD

prevention.^{3–7} Consequently, the diet-heart hypothesis has been a long-standing tenet in CVD prevention and nutritional epidemiology during the last 50 years.^{7,8} Recently, the relevance of overall high-quality food patterns, rather than the focus on single nutrients and foods, has emerged as a powerful paradigm to address the inherent complexity of dietary exposures and to assess their potential CVD preventive effects. Food patterns can be described as the amounts, proportions, combinations or varieties for the consumption of different foods and beverages and the frequency with which they are usually consumed. This approach allows the assessment of synergistic interactions and cumulative effects among different foods and nutrients, pre-empts confounding by alternative dietary exposures, avoids some problems of co-linearity between foods or nutrients and thus provides a strong methodological tool in nutritional epidemiology.^{9,10} Even though randomized dietary intervention trials are the hallmarks for acquiring knowledge on the effects of diet on CVD, most research in the field of dietary patterns is observational, with some potential for residual confounding and other possible sources of bias. These limitations have been the subject of ample but probably undue criticism.^{10,11}

A weakness of the diet-heart hypothesis is that most of the available experimental research in the field has not used hard clinical outcomes, but only intermediate risk biomarkers. The existence of multiple pathways leading from diet to CVD speaks against the simplistic approach of giving a high value to changes in any single biomarker. Moreover, the induction period can vary for the different pathways in which diverse biomarkers are involved, thus limiting the possibility of assessing multiple biomarker combinations at any time point. Furthermore, other lesser-known pathways could account for a substantial proportion of clinical CVD events. The most sensible approach, therefore, in order to investigate the diet-heart hypothesis is to use hard clinical CVD events as end-points of randomized

controlled trials (RCTs). Most feeding trials, however, are usually short term and rarely include clinical end-points such as CVD events or death.¹¹ The PREDIMED trial was designed to overcome both the problem of the single-nutrient approach and the limitations of assessing only intermediate risk markers. Indeed, the PREDIMED randomized trial used an overall food pattern as the intervention and assessed hard CVD events as end-points¹² providing a high level of scientific evidence.

Scientific evidence of the cardio-metabolic benefits of the Mediterranean diet

The abundant and consistent observational evidence that was available to support the benefits of the Mediterranean diet (MeDiet) and, specifically, of tree nuts and olive oil, on CV health prompted us to choose this traditional dietary model enriched with olive oil or nuts as the intervention.^{13–44} Table 1 summarizes the results of meta-analyses and systematic reviews assessing the effects of MeDiet on different cardiometabolic outcomes.

The MeDiet is defined as the traditional dietary pattern found in the early 1960s in Greece, Southern Italy, Spain and other olive-growing countries of the Mediterranean basin. It is a frugal diet that uses generous amounts of olive oil as main culinary fat and has a high consumption of plant-derived foods (fruit, vegetables, legumes, nuts and seeds, and whole grain cereals); frequent but moderate intake of wine (especially red wine), usually with meals; moderate consumption of seafood and dairy products (especially yogurt and cheese, but not whole milk, butter or cream), poultry and eggs; and low consumption of sweet desserts, red and processed meats. In comparison with other healthy patterns, such as the DASH diet, the healthy US dietary pattern or the Alternative Healthy Eating Index, the consumption of fruit and fish is usually higher in the MeDiet, while the consumption of dairy products tends to be lower. In healthy vegetarian food patterns, meat and seafood are not consumed, but eggs and dairy are most frequently included. Legumes, nuts/seeds, and processed soy are all higher in a healthy vegetarian food pattern than in the healthy U.S.-style or Mediterranean-style patterns.

A considerable scientific advantage of the MeDiet over other healthy dietary patterns was the availability of a previous randomized trial, the Lyon Diet Heart study, conducted in myocardial infarction survivors (i.e., it was a secondary prevention trial). It showed that a MeDiet enriched with alpha-linolenic acid, but not olive oil, provided a strong protection against recurrent CHD.⁴⁵

Our hypothesis when designing the PREDIMED trial was that the MeDiet would be superior to a low-fat diet for primary CVD prevention. This hypothesis had never been tested previously using a RCT design.

Design and methods of the PREDIMED study

The PREDIMED study was a primary prevention trial which tested the long-term effects of the MeDiet on incident CVD in men and women at high CVD risk aged 55–75 years (men) or

Download English Version:

<https://daneshyari.com/en/article/3006367>

Download Persian Version:

<https://daneshyari.com/article/3006367>

[Daneshyari.com](https://daneshyari.com)