Cardioprotective Diet for Familial Hypercholesterolemia

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• None to report
Lifestyle Influence

- Familial hypercholesterolemia is characterized by very high levels of total and LDL-C, requiring a variety of approaches for treatment.
- The primary goal of lifestyle intervention is to reduce LDL-C and non-HDL-C. A secondary aim is to reduce other risk factors.
- Healthy lifestyle behaviors include recommending dietary patterns that are cardioprotective to achieve a reduction in LDL-C and improve other established and novel risk factors.
Dietary Lipids

- Dietary fats in particular affect lipoprotein levels (Baum et al. 2012)
- Diets rich in saturated fatty acids and trans fatty acids raise LDL-C, as does a high cholesterol intake (NCEP 2002)
- Monounsaturated and polyunsaturated fatty acids do not raise LDL-C levels (Mensink et al. 2003)
- Diets high in carbohydrate will cause mild to moderate increases in VLDL and often reduce HDL-C levels
- Unsaturated fatty acids do not affect LDL-C levels relative to carbohydrates
Cardioprotective Foods and Food Patterns

- Other dietary factors imparting CVD protection include fruits and vegetables, fish, n-3 fatty acids, nuts, seeds, moderate alcohol intake, low sodium and high potassium intakes (Jenkins et al. 2000; Kris-Etherton et al. 2008; Banel and Hu 2009; Fraser 2009; Sabate et al. 2010; Sofi et al. 2010; Mozaffarian et al. 2011)
Available Evidence

- Increased consumption of nuts, legumes, soluble fiber such as oats and barley and cocoa products like chocolate can reduce blood cholesterol by themselves, independently of the background diet (Ros and Hu 2013)
- Intakes of 2 grams per day of plant sterols and stanols will reduce serum LDL-C levels about 10% (Grundy et al. 1969; Miettinen et al. 1995; Gylling and Miettinen 1999; Blair et al. 2000; Katan et al. 2003)
Available Evidence

- None of these factors have been subjected to rigorous RCTs except for n-3 fatty acids
- In the JELIS study, a primary and secondary prevention study in patients with hypercholesterolemia, eicosapentanoic acid (EPA) reduced risk for major coronary events when combined with a statin (Yokoyama et al. 2007)
- Recently an important RCT following 7447 people has tested the effects of a Mediterranean-type diet on CHD risk (Estruch et al. 2013)
PREDIMED Trial

- Prevencion con Dieta Mediterranea – parallel-group, multicenter, randomized trial
- Designed to test the efficacy of two Mediterranean diets; one supplemented with extra-virgin olive oil and the other with nuts, as compared with a control diet (advice on low-fat diet) on primary cardiovascular prevention
Participant Selection

- Men aged 55-80, women aged 60-80
- No cardiovascular disease at enrollment
- Had either type 2 diabetes or at least three major risk factors (smoking, hypertension, elevated LDL-C, low HDL-C, overweight or obesity or family history of premature CHD)
Dietary Intervention

- Randomly assigned in a 1-1-1 ratio to one of three dietary intervention groups:
  1) Mediterranean diet supplemented with extra-virgin olive oil (approx. 1 liter/week)
  2) Mediterranean diet supplemented with nuts (30 g. of mixed nuts/day)
  3) Control diet
Dietary Intervention

- Two Mediterranean groups received individual and group dietary training sessions by a Registered Dietitian at baseline and quarterly thereafter.
- In each session, a 14-item dietary screener used to assess adherence to the Mediterranean diet so personalized advice could be provided.
Dietary Intervention

- Control group received dietary training at baseline
- Completed the 14-item dietary screener used to assess baseline adherence to the Mediterranean diet
- Received a leaflet explaining the low-fat diet during the first three years of the trial
- Protocol amended; control group then received personalized advice and were invited to group sessions with use of a separate 9-item dietary screener
Other Procedures/Measures

- A general medical questionnaire, a 137-item food-frequency questionnaire and the Minnesota Leisure Time Physical Activity questionnaire were administered on a yearly basis.
- Weight, height and waist circumference were directly measured.
- Biomarkers of compliance – urinary hydroxytyrosol levels and plasma alpha-linolenic acid levels checked.
End Points/Statistical Analysis

- Primary endpoint – a composite of MI, stroke and death from CVD
- Secondary endpoints – stroke, MI, death from CV causes and death from any cause
- Yearly interim analysis began at two years
- The stopping boundary for the benefit of the Mediterranean diet was crossed at the fourth interim evaluation
- DSMB recommended stopping the trial on the basis of endpoint documentation
Results

- Participants were followed for a median of 4.8 years.
- Drop out rates were higher in the control group (11.3%) than in the Mediterranean diet groups (4.9%).
- Participants in the three groups reported similar adherence to the diet at baseline; during follow-up scores on the 14-item Mediterranean diet screener increased for the participants in the two Mediterranean diet groups.
- Changes in biomarkers also indicated compliance.
Results

- The two Mediterranean diet groups significantly increased weekly servings of fish and legumes, and significantly increased consumption of extra-virgin olive oil and nuts.
- There was no significant difference in changes in physical activity among the three groups.
Endpoints

- A total of 288 primary outcome events occurred, 96 in the group assigned to a Mediterranean diet with extra-virgin olive oil (3.8%), 83 in the group assigned to a Mediterranean diet with nuts (3.4%), and 109 in the control group (4.4%)
- Regarding components of the primary endpoint, only the comparisons of stroke risk reached statistical significance
Discussion

- In this trial, an energy-unrestricted Mediterranean diet supplemented with either extra-virgin olive oil or nuts resulted in an absolute risk reduction of approximately 3 major CV events per 1000 person-years, for a relative risk reduction of approximately 30% among high-risk persons who were initially free of CVD.

- Findings are consistent with those of prior observational studies of the CV protective effect of the Mediterranean diet, olive oil and nuts.

- The results support the benefits of the Mediterranean diet for primary prevention of CVD.
Lower Risk of PAD

- For the first time, a RCT suggests a Mediterranean diet may be linked with a lower risk of PAD
- Nonprespecified exploratory analysis of patients in the PREDIMED trial showed those who followed a Mediterranean diet supplemented with extra nuts had half the risk of developing symptomatic PAD
- Those who followed a Mediterranean diet supplemented with extra-virgin olive oil had one third the risk of this outcome
Lower Risk of PAD

- Although the study was blinded and adjusted for biases, it had a small number of events and it is still too early to draw a conclusion.
- Further study is needed to ascertain whether the observed association is due to a reduced incidence of asymptomatic PAD or to a reduced conversion from this early stage of PAD to symptomatic and clinically meaningful PAD.
“Whole Diet” Approach

- People who adopt a “whole diet” approach, such as the Mediterranean diet, have a lower risk of heart attack and cardiovascular-related death than those who follow a strictly low-fat diet.
- Investigators analyzed studies from 1957 to present that looked at the relationship between food and heart disease (Dalen et al. 2014).
“Whole Diet” Approach

- Nearly all the clinical trials in the 1960s, 70s and 80s compared usual diets to those characterized by low total fat, low saturated fat, low dietary cholesterol and increased polyunsaturated fats.
- These diets did reduce cholesterol levels; however, they did not reduce the incidence of MI or CHD deaths.
“Whole Diet” Approach

- The Mediterranean diet mainly focuses on increasing intake of fruits, vegetables, whole grains, pasta and fish, eating products made from vegetable and plant oils and eating less meat.
- This diet incorporates foods that are low in saturated fat, but it also encourages intake of monounsaturated fats that are known to lower cholesterol.
- Their findings show consuming a variety of cardioprotective foods in a diet is better at preventing heart disease than a standard low-fat diet.
Mediterranean Diet and Exercise

- High-intensity interval training combined with a Mediterranean diet “supersizes” heart health
- A study released at the Canadian CV Conference says that lifestyle programs which are focused on high-intensity interval training in combination with nutrition counseling on the Mediterranean diet have been associated with dramatic results for improving the heart health of people with abdominal obesity
Mediterranean Diet and Exercise

- Dr. Mathieu Goyda, one of the study’s authors and an exercise physiologist at the Montreal Heart Institute, says heart health benefits include dramatic improvements in body fat mass, muscle endurance, weight loss, waist circumference, cholesterol and blood pressure levels, exercise capacity, resting heart rate and blood sugar control.
Healthy Behaviors Protect Heart Health

- A report released from the Heart and Stroke Foundation (2013) finds healthy behaviors protect your heart and can help you gain healthy years of life.
- A sedentary lifestyle results in about four lost quality years of life.
- Eating a poor diet results in about three lost quality years of life.
- Quitting smoking can ADD two and a half more quality years of life.
Healthy Behaviors Protect Heart Health

- Excessive stress can cost you nearly two years of quality life
- Excessive alcohol consumption may cost you two quality years of life
- Bottom line – staying in shape and eating well is vital for good cardiac health and longevity with a high quality of life
- The Mediterranean diet offers optimal nutrition for heart health, especially combined with exercise and other healthy lifestyle practices
Educating Our Patients

- The “latest research” information is often conflicting and confusing to our patients
- Need to help them sort out the barrage of information from so many sources – journals, news reports, the internet, advertising, testimonials and social media
- Need to individualize and focus on what works for each person
- Many tools available to assist the patient – use of food diaries, exercise trackers, online tools, smart phone apps, as well as customized handouts
The Final Word

- With the challenges of managing familial hypercholesterolemia and seeing patients with complex disorders, every treatment strategy needs to be implemented, including the benefits of a cardioprotective diet.

- We as practitioners, whether physician, nurse, exercise specialist, dietitian, nurse practitioner, physician assistant, etc. are truly blessed with the ability to positively impact the lives of our patients through our treatment and education.