LE Magazine December 2003

COVER STORY

How You Can Help End the Heart Disease Epidemic

By Heather Lindsey

The latest science coupled with advanced nutrition is providing us with a road map to help end heart disease. Research now confirms that a scientific program based on blood testing, supplements, exercise and nutrition can help lower your risk of developing cardiovascular disease. Life without this disease could become a reality.

Around the world, scientists have been putting together the pieces of the heart disease puzzle. The studies are impressive and the results extremely promising. For example, some of the latest research has found that C-reactive protein levels in the blood may be a better predictor of heart disease than low- density lipoprotein (LDL). Researchers have also found that supplements such as fish oil can reduce coronary deaths, while coenzyme Q10 has a positive impact on cardiac arrhythmias and exercise tolerance.

Life Extension has consolidated all of the latest research and assembled a step-by-step plan that if followed should drastically reduce your chances of heart disease.

Dietary Approaches to Stop Hypertension (DASH)

Dietary Approaches to Stop Hypertension, or the DASH diet, is an eating plan low in saturated fat, cholesterol and total fat designed to reduce blood pressure. It emphasizes fruits, vegetables and low-fat dairy foods, but also includes whole grains, beans, fish, poultry and nuts. Additionally, the DASH diet reduces intake of red meat, sugar and alcohol.

In a landmark 1997 study,[3] researchers studied diet in 459 adults with systolic blood pressures of less than 160 mm Hg and diastolic blood pressures of 80 to 95 mm Hg.

For three weeks, the subjects were fed a control diet low in fruits, vegetables and dairy products, with a fat content typical of an average American diet. Participants were then randomly assigned to receive for eight weeks the control diet, a diet rich in fruits and vegetables, or a “combination” diet rich in fruits, vegetables, and low-fat dairy products, with reduced saturated and total fat—in other words, the DASH diet.

Researchers found that DASH reduced systolic blood pressure by 5.5 mm Hg and diastolic blood pressure by 3.0 mm Hg compared to the control (typical American) diet. The fruits and vegetables diet also reduced systolic and diastolic blood pressure but not as much as DASH. Among the 133 people with hypertension, the DASH diet reduced systolic and diastolic blood pressure even more (by 11.4 and 5.5 mm Hg, respectively). Researchers concluded that the combination or DASH diet can substantially lower blood pressure.

It is commonly known that reducing your salt intake can also help to lower blood pressure. An additional DASH study found that reducing salt consumption to levels below the current recommendation of 100 mmol per day and following the DASH diet will lower blood pressure substantially, with greater effects in combination.[4]

The DASH-low sodium diet also appeared to lower the levels of total cholesterol (TC) and low-density lipoprotein (LDL). People on the DASH-low sodium eating plan reduced their TC levels by 7.3%, and their levels of LDL by 9%.[5]

Fish Consumption Lowers Risk

In addition to the benefits of the DASH diet and lowering sodium intake, researchers have been interested in the specific heart-healthy impact of fish. Scientists have found that consuming fish can help to substantially lower the risk of heart disease.

In a recent study,[6] investigators determined that eating certain types of fish decreases the risk of ischemic heart disease (IHD), a condition in which the blood flow is restricted to the heart muscle, as well as myocardial infarctions or heart attack. Specifically, eating broiled or baked fatty fish such as salmon, tuna and herring at least once or twice a week lowered arrhythmic IHD death by 58% and the risk of a fatal heart attack by about 50%.

Eating fried fish or fish sandwiches was not associated with lower risk of total IHD death, arrhythmic IHD death or nonfatal heart attack, but instead was associated with trends toward higher risk.

The American Heart Association (AHA) recommends that healthy adults eat at least two servings of fish a week, particularly fish such as mackerel, lake trout, herring, sardines, albacore tuna and salmon. These fish contain two heart healthy omega-3 fatty acids: eicosapentaenoic (EPA) and docosahexaenoic (DHA).

Exercise benefits your health

In addition to diet, another well-known way to reduce the risk of developing heart disease is to exercise. According to the AHA, the relative risk of coronary heart disease associated with physical inactivity ranges from 1.5 to 2.4, an increase in risk comparable with that observed for high cholesterol, high blood pressure and cigarette smoking.

AHA notes that participating in low-to-moderate intensity activities such as walking, climbing stairs, gardening, housework, dancing and home exercise for at least 30 minutes a day can benefit your heart health. More vigorous aerobic activities, such as brisk walking, running, swimming, bicycling, roller skating and jumping rope done most days of the week for at least 30 minutes are best for improving the fitness of the heart and lungs, according to the AHA.

Assessing Your Risk

Before deciding upon any dietary measures or what type of physical activity to pursue, you may want to assess your risk for cardiovascular disease.

Testing for C-reactive protein

In addition to the more familiar ways of screening for heart disease, such as monitoring cholesterol and checking blood pressure, clinical studies have found that screening for the presence of C-reactive protein (CRP) is very important.

Research suggests that inflammation, the way the body responds to injury, plays a role in arteriosclerosis, the process in which fatty deposits build up in the lining of arteries.[7] CRP levels increase during systemic inflammation and testing the levels of this protein in the blood can help assess cardiovascular disease risk. In fact, CRP may be a stronger predictor of heart disease than LDL cholesterol level.[8] A high sensitivity assay for CRP (hs-CRP) is now widely available.

High levels of CRP can predict new coronary events in patients with stable coronary artery disease. Additionally, large-scale studies have shown that high hs-CRP levels predict risk of future heart attack, stroke, peripheral arterial disease and vascular death in people

without known cardiovascular disease.[10-14] High CRP has also been associated with increased vascular events in people with acute ischemic heart disease, stable angina and a history of heart attack.[10]

According to the AHA, if a person has an intermediate risk of cardiovascular disease, a CRP test can help predict a cardiovascular and stroke event and help direct further evaluation and therapy. The benefits of such therapy based on this strategy, however, remain uncertain. A person at high risk or who has established heart disease or stroke should be treated intensively regardless of hs-CRP levels, states the AHA.

COVER STORY

How You Can Help End the Heart Disease Epidemic

By Heather Lindsey

Testing homocysteine levels

Testing your homocysteine levels is another way to determine your risk of heart disease. Homocysteine is an amino acid in the blood, too much of which is related to an elevated risk of coronary heart disease in patients already at high risk.[15] Homocysteine is also associated with stroke[16] and peripheral vascular disease.[17]

This marker may also predict risk of the development of congestive heart failure in adults with no history of heart attack[18] and predicts cardiac death in stable patients following premature heart attack.[19] Homo-cysteine may also be an independent risk factor for atherosclerosis.[20]

Homocysteine levels and nutrients

Dietary factors tend to influence homocysteine levels in blood plasma. Folic acid, trimethylglycine (TMG), vitamins B6 and B12 have the greatest effects on homocysteine, helping to break down the amino acid in the body.[21-23]

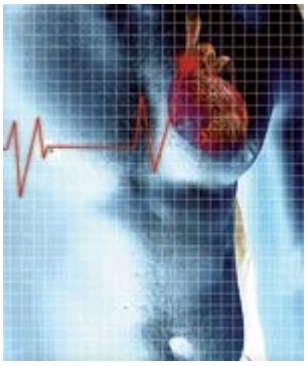
According to one study, a daily multivitamin that contains 400 mcg of folic acid should be considered for patients who have documented coronary heart disease, especially when other risk factors are absent or in patients with premature atherosclerosis, and for men and women who have cardiovascular risk factors.[24] Increasing vitamins B6 and B12 in the diet of patients with high levels of homocysteine also helps to lower the amino acid.[21,25] Higher blood levels of B vitamins are related, at least partly, to lower concentrations of homocysteine.[26]

In addition to folic acid and vitamins B6 and B12, a variety of other supplements may help to keep cardiovascular disease at bay.

Fish oil

You already know that adding fish to your diet can help lower your risk of heart disease. Can taking fish oil supplements have the same impact? Research indicates that it might.

One recent study of more than 11,000 patients showed that fish oil supplements (1 gram per day) reduced the risk of cardiac deaths after six to eight months in people who have had a prior heart attack. At the end of the trial, patients who took fish oil supplements had a 45% lower death rate than those who did not.[27]



The American Heart Association notes that people who have elevated triglycerides may need 2-4 grams of EPA and DHA per day provided as a supplement. Those taking more than 3 grams of omega-3 fatty acids from supplements should do so only under a physician's care. The Food and Drug Administration has noted that high intake could cause excessive bleeding in some people.

Policosanol

Policosanol, a cholesterol-lowering supplement purified from sugar cane wax and taken in doses of 5-20 milligrams daily, may help to lower cholesterol levels.

One clinical study showed that in patients with high cholesterol, policosanol at 5 mg reduced LDL by about 17%, while 10 mg reduced LDL by about 24%. Policosanol at the same doses also lowered total cholesterol by approximately 13% and 16%, respectively. The supplement also increased HDL ("good" cholesterol), which can protect against heart disease.[28]

Policosanol may rival some statins, commonly prescribed to lower cholesterol, in helping to increase HDL while having minimal side effects. Researchers compared policosanol to the drug atorvastatin, a common lipid-lowering drug, in doses of 10-80 mg/day. Atorvastatin was more effective than policosanol in reducing LDL and total cholesterol; however, policosanol, but not atorvastatin, increased serum HDL levels. Policosanol was also better tolerated than atorvastatin, as revealed by overall frequency of adverse events such as muscle cramps, gastritis, uncontrolled hypertension, abdominal pain and myalgia.[29]

Coenzyme Q10

Coenzyme Q10 (CoQ10) is a fat-soluble, vitamin-like substance found in all human cells and has shown benefit as an additional treatment to standard treatment methods in people with congestive heart failure (CHF).

CoQ10 produces energy in cells and acts as an antioxidant. It is naturally present in many types of food, including organ meats

such as the heart, liver and kidney, as well as in beef, soybean oil, sardines, mackerel and peanuts. CoQ10 is also available as a dietary supplement.

Scientists recently evaluated data from 1974 through 2000 to provide recommendations regarding the safety, effectiveness and dosing of CoQ10 in the management of CHF, angina and hypertension. They found that CoQ10 taken orally appears to be safe and well tolerated in the adult population. Researchers noted that because CoQ10 has favorable effects on ejection fraction (the measure of the amount of blood pumped out when the heart contracts), exercise tolerance, cardiac output (the total volume of blood pumped by the ventricle per minute) and stroke volume (the amount of blood pumped out of one ventricle of the heart as the result of a single contraction), it may be recommended as an additional therapy in selected patients with CHF.[30]

According to the study, however, CoQ10 therapy in angina and hypertension cannot be substantiated until additional clinical trials demonstrate consistent beneficial effects. Additionally, CoQ10 should not be recommended as monotherapy or first-line therapy in any disease state.[30]

Earlier research found that patients with CHF benefited from taking CoQ10 in a number of ways. For example, improvements in symptoms were experienced by about 78% of patients with cyanosis (blue skin), 79% with edema, 78% with pulmonary edema, 53% with dyspnea, 53% with heart palpitations, 80% with sweating, 80% with arrhythmia and 73% with vertigo.[31]

The American Heart Association says that until more data are available, nutritional supplements such as CoQ10 cannot be recommended to treat heart failure.[32] (In Japan, CoQ10 has been an approved drug for congestive heart failure for the past 30 years.)

Serrapeptase

Serrapeptase is a protein-dissolving enzyme that can have an anti-inflammatory effect in patients, according to published studies.[32-34] For instance, scientists have reported that serrapeptase can reduce inflammation in patients with ear, nose and throat disorders.[32]

While anecdotal evidence indicates it may have antiatherosclerotic benefit, no published studies have yet been conducted to confirm this. Hans A. Nieper, M.D., an internist from Hannover, Germany, studied the effects of serrapeptase on plaque accumulations in the arteries, which can lead to hardening of the arteries, stroke and heart attack. He found that the enzyme helped to prevent plaque build-up though its protein-dissolving properties. Further studies are needed to validate this finding.[35]

Testosterone

The influence of sex hormones, especially testosterone, on coronary artery disease in men has been relatively ignored.[36]

Men with coronary artery disease, however, have lower concentrations of testosterone in their blood than those with normal heart health.[37] Additionally, hypogonadism, a glandular disorder resulting in low testosterone levels, is twice as common in men with heart disease than in the general population.[36]

Low testosterone is also associated with high LDL, low HDL and high triglycerides, as well as high blood pressure. Administration of testosterone also may help open up blood vessels,[37] improve exercise tolerance and reduce angina in men with coronary artery disease.[38]

Low testosterone in older men may have a negative impact on atherosclerosis and explain their higher incidence of coronary heart disease.

Researchers note that improved formulations of testosterone are gradually becoming available in patches, gels and buccal release.

The bottom line

Although heart disease continues to be an epidemic, you can take a number of steps to lower your risk of developing the condition. Before starting any eating plan, exercise program or nutrition supplement program, be sure to consult with your physician. In addition to checking your blood pressure and cholesterol, make sure your blood is tested for C-reactive protein, homocysteine and free testosterone. If you are overweight, check your fasting insulin blood levels to rule out Type II diabetes. Excess fasting insulin can indicate a pre-diabetic or frank diabetic state. With the proper health strategy, you can help make the heart disease epidemic a problem of the past.

COVER STORY

How to Be Proactive with Your Doctor

Part of taking care of your heart is becoming a proactive participant in your health care and communicating with your doctor. Following are some of the questions you should ask your physician to determine your risk for cardiovascular disease.

What is my blood pressure and how does it compare with new national guidelines?

The National Heart Blood and Lung Institute (NHBLI) issued new blood pressure guidelines in May 2003 that state the following:[1]

Normal:
less than 120/
less than 80 mm Hg

Prehypertension:
120-139/
80-89 mm Hg

Stage 1 hypertension:
140-159/
90-99 mm Hg

Stage 2 hypertension:
at or greater than 160/
at or greater than 100 mm Hg
It is crucial that blood pressure remain in the normal range.

What is my total cholesterol and lipoprotein profile?

A lipoprotein profile measures total cholesterol; high-density lipoprotein (HDL), which helps prevent cholesterol from building up in the arteries; low-density lipoprotein (LDL), which causes cholesterol to build up in the arteries; and triglycerides, which are another form of fat in the blood.[2]
The following guidelines have been established by conventional doctors to assess cardiovascular risk:

Total cholesterol:
less than 200 mg/dL is desirable
200-239 is borderline high
240 and above is high

LDL:
less than 100 mg/dL is optimal
100-129 is near optimal
130-159 is borderline high
160-189 is high
190 and above is very high

HDL:
less than 40 mg/dL is
considered a risk factor
more than 60 lowers your risk

Triglycerides:
Under 100 mg/dL is ideal
150-199 is borderline high
200 or more is high

If I'm taking a statin, should I be taking Coenzyme Q10 supplements?

While millions of Americans take statins to reduce their cholesterol levels, many do not realize these drugs can also lower levels of Coenzyme Q10 (CoQ10). This enzyme produces energy in cells and helps the heart muscle function. Consequently, if you are taking a statin drug, you may want to talk to your doctor about taking a CoQ10 supplement.[6]

References

1. Centers fror Disease Control and Prevention. About Cardiovascular Disease. Available at: http://www.cdc.gov/cvh/aboutcardio.htm Accessed June 5, 2003

2. Healthy People 2010. Chapter 12. Heart Disease and Stroke. Available at: http://hin.nhlbi.nih.gov/cvd_frameset.htm. Accessed on June 5, 2003.

3. Appel LA, et al. Effects of dietary patterns on blood pressure. N Engl J Med. Apr 17;336 (16):1117-1124.

4. Sacks FM, et al. Effects on blood pressure of reduced dietary sodium and the Dietary Approaches to Stop Hypertension (DASH) diet. DASH-Sodium Collaborative Research Group. N Engl J Med. 2001 Jan 4;344(1) 3-10.

5. Obarzanek E, et al. Effects on blood lipids of a blood pressure-lowering diet; the Dietary Approaches to Stop Hypertension (DASH) Trial. Am J Clin Nutr. 2001 Jul;74(1):80-89.

6. Mozaffarian D, et al. Cardiac benefits of fish consumption may depend on the type of fish meal consumed: The Cardiovascular Health Study. Circulation. 2003 Mar 18;107(10):1372-1377.

7. Auder J, et al. C-reactive protien and coronary artery disease. Jpn Heart J. 2002 Nov;43(6):607-619.

8. Ridker PNM, et al. Comparison of C-reactive protein and low-density lipoprotein cholesterol levels in the prediction of first cardiovascular events. N Engl J Med. 2002 Nov 14;347(20):1557-1565.

9. Speidl WS, et al. High-sensitivity C-reactive protein in the prediction of coronary events in patients with premature coronary artery dis- ease. Am Heart J. 2002 DSep;144(3):449-455.

10. Ridker PM, et al. High-sensitivity C-reactive protein: potential adjunct for global risk assessment in the primary prevention of cardio- vascular disease. Circulation. 2001 Apr 3; 103(13):1813-1818.

11. Ridker PM, et al. C-reactive protein and other markers of inflammation in the prediction of cardiovascular disease in women. N Engl J Med. 2000 Mar 23;(342)12:836-843.

12. Kuller LH, et al. Relationship of C-reactive protein and coronary heart disease in the MRFIT nested case-control study. Am J Epidemiol. 1996;144:537-547.

13. Mendall MA, et al. C-reactive protein relation to total mortality, cardiovascular mortality and cardiovascular risk factors in men. Eur Heart J. 2000Oct;21(19):1584-1590.

14. Ridker PM, et al. Plasma concentration of C- reactive protein and risk of developing periph- eral vascular disease. Circulation. 1998 Feb 10;97(5):425-428.

15. De Bree A, et al. Homocysteine determinants and the evidence to what extent homocysteine determines the risk of coronary heart disease. Pharmacol Rev. 2002 Dec;54(4):599-618.

16. Kelly PJ, et al. Homocysteine, MTHFR677C --T polymorphism and risk of ischemic stroke: results of a meta-analysis. Neurology. 2002 Aug 27;59(4):529-536.

17. Kuan YM, et al. Homocysteine: An aetiological contributor to peripheral vascular arterial dis ease. ANZ J Surg. 2002 Sep;72 (9):668-671.

18. Vasan RS, et al. Plasma homocysteine and risk for congestive heart failure in adults without prior myocardial infarction. JAMA 2003 Mar 12;89(10):1251-1257.

19. Retterstol L, et al. Plasma total homocysteine levels and prognosis in patient with previous premature myocardial infarction: a

10-year follow-up study. JIntern Med. 2003 Mar;253(3):284-292.

20. Nehler MR, et al. Homocysteinemia as a risk factor for atherosclerosis: a review. Cardiovas Surg. 1997;5:559-567.

21. Chambers JC, et al. Improved vascular endothelial function after oral B vitamins: An effect mediated through reduced concentra- tions of free plasma homocysteine. Circulation. 2000 Nov 14;102(20):2479-2483.

22. Selhub J, et al. Relationship between plasma homocysteine and vitamin status in the Framingham study population. Impact of folic acid fortification. Public Health Rev. 2000;28(1-4):117-145.

23. Verhoaf P, et al. Homocysteine metabolism and risk of myocardial infarction: relation with vita- mins B6, B12 and folate. Am J Epidemiol. 1996 May 1;143(9):845-859.

24. Abby SL, et al. Homocysteine and cardiovascu- lar disease. J Am Board Fam Pract. 1998 Sep- Oct;11(5):391-398.

25. Undas A, et al. Treatment of hyperhomocys- teinemia with folic acid and vitamins B12 and B6 attenuates thrombin generation. Thromb Res. 1999 Sep 15;95(6):281-288.

26. Chao CL, et al. Effect of short-term vitamin (folic acid, vitamins B6 and B12) administra- tion on endothelial dysfunction induced by post-methionine load hyperhomocysteinemia. Am J Cardio. 1999 Dec 1;84(11):1359-1361.

27. Marchioli R, et al. Early protection against sud- den death by n-3 polyunsaturated fatty acids. Circulation. 2002 Apr 23;105 (16):1897-1903.

28. Castano G, et al. Effects of policosanol in older patients with type II hypercholesterolemia and high coronary artery risk. J Gerontol A Biol Sci Med Sci. 2001 Mar;56(3):M186-192.

29. Castano G, et al. Comparisons of the efficacy and tolerability of policosanol with atorvastatin in elderly patients with type II hypercholes- terolemia. Drugs Aging 2003;20(2):153-163.

30. Tran MT, et al. Role of coenzyme Q10 in chron- ic heart failure, angina and hypertension. Pharmacotherapy. 2001 Jul;21 (7):797-806.

31. Baggio E, et al. Italian multicenter study on the safety and efficacy of coenzyme Q10 as adjunc- tive therapy in heart failure. CoQ10 Drug Surveillance Investigators. Mol Aspects Med. 1994;15 Suppl:s287-294.

32. Guidelines for the Evaluation and Management of Chronic Heart Failure in the Adult. Available at:http://www.acc.org/ clinical/guidelines/failure/hf_index.htm. Accessed May 25, 2003.

33. Esch PM, et al. Reduction of postoperative swelling. Objective measurement of swelling of the upper ankle joint in treatment with ser- rapeptase-a prospective study. Fortschr Med. 1989 Feb 10;107(4):67-8,71-2.

34. Majima Y, et al. The effect of an orally admin- istered proteolytic enzyme on the elasticity and viscosity of nasal mucus. Arch Otohinolaryngol. 1988;244(6):355-359.

35. Mazzone A, et al. Evaluation of Serratia pepti- dase in acute or chronic inflammation of otorhinolaryngology pathology: a multicenter, double-blind, randomized trial versus placebo. J Int Med Res. 1990 Sep-Oct;18(5):379-388.

36. Brewer Science Library website. Available at: http://www/mwt.net/~drbrewer/niep_art.htm. Accessed May 28, 2003.

37. Channer KS, et al. Cardiovascular effects of testosterone: implications of the “male menopause?” Heart 2003 Feb;89(2):121-122.

38. English KM, et al. Men with coronary artery disease have lower levels of testosterone than those with normal coronary angiograms. Eur Heart J. 2000 Jun;21(11):890-894.

39. English KM, et al. Low-dose transdermal testosterone therapy improves angina thresh- old in men with chronic stable angina: A ran- domized, double-blind, placebo-controlled study. Circulation. 2000 Oct 17;102(16):1906-1911.