

Jury Out on Value Of Low-Carb Diets

BY JOHN R. BELL
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Evidence on the overall impact of low-carbohydrate diets on cardiovascular health is insufficient for making general recommendations to patients seeking weight loss advice, according to the findings of a metaanalysis.

Based on a review of five randomized controlled trials comparing low-fat and low-carb diets, Dr. Alain J. Nordmann of the Basel (Switzerland) Institute for Clinical Epidemiology and his colleagues concluded that while low-carb diets lead to greater short-term weight loss, their effect on lipid levels and other cardiovascular risk factors appeared to be mixed.

Across all studies, the 222 participants in the low-carb diet groups were permitted a carbohydrate intake of no more than 60 g/day but had no calorie restrictions. The 225 participants in the low-fat diet groups were allowed no more than 30% of daily calories from fats, and those with a body mass index of 25 kg/m² or more had calorie restrictions (Arch. Intern. Med. 2006;166:285-93).

The 447 participants had a mean age range of 42-49 years. All five trials were unblinded.

At 6 months' follow-up, patients on low-carbohydrate diets had lost more weight than those on low-fat diets and were more likely to have completed the trial than were their low-fat diet counterparts (weight-

ed mean difference -5.3 kg vs. -1.4 kg). The investigators also noted a trend toward lower systolic and diastolic blood pressure among low-carb dieters.

In addition, compared with low-fat dieters, low-carb participants had better HDL and triglyceride levels. However, they also had less favorable total cholesterol and LDL-cholesterol values.

Differences in weight loss between the groups diminished in the three studies with 12-month follow-up (weighted mean difference -3.5 kg vs. -1.5 kg). Also, the attrition advantage for the low-carb group had become statistically insignificant, and the low-carb group's blood pressure advantage over the low-fat group was no longer detectable.

Moreover, the low-fat dieters' more favorable serum LDL and total-cholesterol profile remained favorable at the 12-month mark, as did their more favorable change in serum triglyceride, while the HDL-level advantage seen at 6 months for the low-carb group was no longer definitive at 12 months.

The authors concluded that "there is still insufficient evidence to make recommendations for or against" low-carb diets, "especially for durations longer than 6 months." It's uncertain whether the positive effects of a low-carb diet on HDL cholesterol and triglyceride levels outweigh its less favorable effects on serum LDL cholesterol levels, they said. ■

Thin and Unfit Bests Fat And Fit for CHD Risk

DALLAS — Is it better from the standpoint of cardiovascular risk to be fat and fit, or lean and unfit?

That's a question in the minds of many roly-poly regular exercisers and skinny couch potatoes who are contemplating a lifestyle change. And Dr. Charles B. Eaton provided the answer at the annual scientific sessions of the American Heart Association.

Young adults who are lean and have poor cardiorespiratory fitness have a coronary heart disease risk profile that is clearly better than that of overweight individuals with high fitness. But the best CHD risk factor profiles of all belong to individuals with high fitness and a normal body mass index (BMI), according to Dr. Eaton of Brown University, Providence, R.I.

He analyzed cross-sectional data on a representative sample of 2,178

Americans aged 20-49 years who were included in the National Health and Nutrition Examination Survey for 1999-2002. Dr. Eaton categorized the subjects as having low, medium, or high cardiorespiratory fitness based upon their estimated VO₂ max compared with age- and gender-specific norms. He further cross-stratified participants as normal-weight—meaning a body mass index of less than 25 kg/m²—overweight, or obese as defined by a BMI in excess of 30.

When Dr. Eaton plugged in data on each subject's total cholesterol, HDL, blood glucose, and insulin levels, as well as insulin resistance and systolic blood pressure, the composite CHD risk factor profile that emerged shot down the hypothesis that fat but fit is better than lean but unfit.

—Bruce Jancin

ALTERNATIVE MEDICINE

AN EVIDENCE-BASED APPROACH

Pomegranate for Cardiovascular Disease

History of Use

In Greek mythology, Persephone was the daughter of Zeus, king of the gods, and Demeter, the goddess of agriculture. Persephone was pursued and abducted by Hades, the god of the underworld, and Demeter retaliated for the loss of her daughter by ruining the harvest and causing starvation. Zeus finally convinced Hades to give up the girl—but this would be possible only if she had eaten nothing in the underworld. Unfortunately, she had eaten four pomegranate seeds, so a compromise was reached: Persephone would spend part of the year on earth—the months that corresponded to the growing season—and would spend the remaining months in the underworld with Hades.

Many religions have ascribed significance to the fruit of *Punica granatum*. In Judaism, the pomegranate is said to contain 613 seeds, one for each of the commandments in the Torah. The pillars of King Solomon's temple and the robes of kings were adorned with depictions of pomegranates. In Buddhism, the pomegranate, the citrus, and the peach are considered the three blessed fruits.

In Christianity, the fruit is a symbol of resurrection and often included in depictions of Christ and his mother. In the Koran, paradise is described as having gardens in which pomegranate trees are found, and, according to Islamic legend, each earthly pomegranate fruit contains one seed from paradise (BMJ 2000;321:1153-4).

Rationale for Use

Like other berries and grapes, pomegranates possess significant antioxidant properties deriving from components such as polyphenolics, tannins, and anthocyanins. Animal studies have suggested that dietary supplementation with these plant antioxidants inhibits events associated with atherosclerosis, including LDL oxidation and macrophage foam cell formation.

Clinical Investigations

A group of researchers from the Lipid Research Laboratory, Rappaport Family Institute for Research in the Medical Sciences, Rambam Medical Center, Haifa, Israel, have been investigating the effects of pomegranate juice on various aspects of cardiovascular disease.

In their early studies, they observed that pomegranate juice consumption reduced oxidative stress, atherogenic modifications to LDL, and platelet aggregation in mice and humans (Am. J. Clin. Nutr. 2000;71:1062-76). They also found that it inhibited serum angiotensin-converting enzyme activity and lowered systolic blood pressure in a small group of hypertensive patients (Atherosclerosis 2001;158:195-8).

They then investigated the effects of pomegranate juice on various clinical parameters in patients with carotid artery stenosis.

A group of 19 patients ranging in age from 65 to 75 years with asymptomatic, severe carotid artery stenosis were randomized to receive 50 mL of pomegranate juice or placebo each day for 1 year.

At baseline, B-mode ultrasound images of carotid artery wall boundaries were obtained, and intimal medial thickness (IMT) was measured at the far wall of the distal common carotid arteries. Atherosclerotic plaques were imaged and their length and width assessed, and flow velocities in the internal carotid arteries were calculated at sites of stenosis.

Among the 10 patients who consumed pomegranate juice, the mean IMT of the left and right common carotid arteries decreased by 13%, 22%, 26%, and 35% at months 3, 6, 9, and 12, respectively. In the placebo group, mean IMT increased significantly, by 9%, from 1.52 mm to 1.65 mm (Clin. Nutr. 2004; 23:423-33). Average IMT in middle-aged men ranges from 0.7 mm to 1.2 mm.

Mean systolic blood pressure fell from 174 mm Hg at baseline to 153 mm Hg at 12 months, and mean peak systolic velocity in both left and right carotid arteries fell by 21% in the pomegranate juice group.

In the pomegranate group, serum oxidative state—evaluated by measurement of the concentration of antibodies against oxidized LDL—fell by a significant 24% in the first month and by an additional 19% by the third month.

Serum glucose and lipid concentrations were not significantly altered, but the lipid peroxide content in the atherosclerotic lesions of patients in the pomegranate group was significantly reduced, by 61% and 44% at 3 and 12 months, respectively.

The authors noted that, "in addition to the regression of the carotid lesion size, the lesion itself may be considered less atherogenic after pomegranate juice consumption, as its cholesterol and oxidized lipid content decreased, and since its ability to oxidize LDL was significantly reduced."

A group of California researchers including Dr. Dean Ornish also has been evaluating pomegranate juice in 45 patients with coronary heart disease and myocardial ischemia. Patients were randomized to receive 240 mL/day of pomegranate juice or a sports drink of similar caloric content, taste, and appearance. They were evaluated by single-photon emission computed tomographic scintigraphy at rest and during treadmill or pharmacologic stress testing at baseline and at 3 months, and the degree of inducible ischemia was calculated.

Myocardial perfusion improved by an average of 17% in the pomegranate group after 3 months, and worsened by an average of 18% in the control group, for a relative between-group difference of 35% (Am. J. Cardiol. 2005;96:810-4). Angina episodes decreased by 50% in the treatment group and increased by 38% in the control group.

The benefits were seen without any change in cardiac medications.

The investigators acknowledged that their sample size was small, but said that the clinically and statistically significant improvements seen "suggest that daily consumption of pomegranate juice may have important clinical benefits in this population."

—Nancy Walsh

► Pomegranate fruit has a long history of use in the folk medicine of many cultures.

► Small clinical studies suggest possible benefits of pomegranate juice in atherosclerosis and coronary heart disease.