Arterial Function Deteriorates on Atkins Diet

BY NEIL OSTERWEIL

BOSTON — Proponents of the Atkins low-carbohydrate/high-saturated-fat diet say that you can have your steak and eat it, too, and still lose weight.

But the adverse metabolic consequences are too heavy a price to pay, Australian investigators reported at a symposium sponsored by the International Atherosclerosis Society.

After 1 year, overweight and obese patients randomly assigned to the Atkins diet or to a low-saturated-fat, high-carbohydrate diet lost similar amounts of weight. But patients on the Atkins diet had a deterioration in flow-mediated arterial dilatation, a marker for cardiovascular disease, and higher levels of LDL cholesterol than at baseline, reported Dr. Peter Clifton of the Commonwealth Scientific and Industrial Research Organization (CSIRO) in Adelaide, South Australia.

"What I really want to know is, does the early elevation of HDL, which has been shown convincingly [with the Atkins diet], and lowering of triglycerides plus the lowering of blood pressure and glucose outweigh the rise in LDL cholesterol that you see in some individuals in some studies?" he said.

"Of course, there are no Atkins end point studies, which is a bit disappointing since there are a fair number of advocates of the Atkins diet," he added.

Dr. Clifton and his colleagues analyzed the effects of two diets on flow-mediated dilatation (FMD), a measurement of the ability of blood vessels to dilate in response to increases in blood flow. FMD is reduced in both cardiovascular disease and diabetes, but whether it improves with significant weight loss is unclear; if so, it might be related to either decreases in glucose or in LDL, Dr. Clifton said.

The study's aim was to evaluate the effects on markers of endothelial dysfunction and cardiovascular disease risk of a very-low-carbohydrate/high-saturated-fat diet, and an isocaloric high-carbohydrate/low-saturated fat diet.

The outcomes were FMD and markers of endothelial dysfunction, including cellular adhesion molecules, inhibitors and promoters of fibrinolysis, adiponectin, glucose, insulin, C-reactive protein (CRP), lipids, and apolipoprotein B.

The study involved 70 men and women aged 16-60 years with body mass index between 27 and 40 kg/m^2, and markers for the presence of metabolic syndrome.

Endothelial function decreased by almost half from baseline among patients on the Atkins diet, compared with no change among patients on the low-fat diet.

The Atkins diet consisted of 35% protein, 61% fat (20% saturated fat), and 4% carbohydrates. The low-fat diet was composed of 30% fat (less than 8% saturated), 46% carbohydrates, and 24% protein.

"We managed to keep people on the Atkins diet for a year without too many complaints, and certainly they had no constipation or halitosis," Dr. Clifton said. These effects often result from the ketogenic state induced by the Atkins diet.

After 1 year, the 33 patients on the Atkins diet lost slightly more weight on average (14.5 kg) than did the 36 patients on the low-fat diet (11.5 kg), but this difference was not significant. Body fat decreased by a mean 11.3 kg among the Atkins dieters, and by 9.4 kg among the low-fat dieters, a difference that was not significant. Loss of muscle mass was significantly greater among those on the meat-heavy diet, at a mean of 3.2 vs. 2.3 kg for the low-fat, high-carb diet.

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Flow-mediated dilatation "deteriorated after 12 months on a high-saturated-fat Atkins diet, despite [patients'] fantastic weight loss and improvement" on other measures.

There was no diet-specific effect on blood pressure, glucose, insulin, or CRP, but the Atkins diet was superior to the low-fat diet at decreasing triglycerides and increasing HDL. The Atkins diet also was associated with increases in LDL levels. In addition, apolipoprotein B, a marker for cardiovascular disease, increased with the Atkins diet and declined with the low-fat diet, although this difference was not significant.

Overall, 49 patients (26 on the Atkins diet, 23 on the low-fat diet) underwent FMD assessment. Endothelial function decreased by almost half from baseline among patients on the Atkins diet, compared with no change among patients on the low-fat diet. Pulse-wave velocity, a measure of arterial stiffness, improved significantly over baseline in both groups, with no diet-specific effect; another measure of stiffness, augmentation index, did not change in either group.

"So overall, FMD deteriorated after 12 months on a high-saturated-fat Atkins diet, despite their fantastic weight loss and improvement in all those other things," Dr. Clifton said. "Solely because the LDL increased, it outweighed all the other measures of weight loss. The other measures of endothelial function that we took actually improved except ICAM-1 on the Atkins diet, so there seems to be a separation of endothelial functions as expressed by nitric oxide and these other endothelial markers.

"This really calls into question that fantastic elevation of HDL [with the Atkins diet] as being a good thing or having anything much to do with cardiovascular health," he added, noting that when changes in HDL in clinical trials are adjusted for LDL changes, any potential relationship of HDL to cardiovascular disease outcomes disappears.

Dr. Clifton disclosed that he has coauthored diet books, but they do not include the information he presented. ■

Weight-Loss Diets Best When Matched to Patient Preferences

BY NEIL OSTERWEIL

BOSTON — The most successful diet for weight loss is the one that patients will stick with, provided that it has a balance of protein, fats, and carbohydrates.

"Successful diets for weight loss can emphasize a large range of macronutrient intakes," Dr. Frank Sacks said at a symposium sponsored by the International Atherosclerosis Society.

"Diets should be made with foods that reduce the risk of cardiovascular events in and of themselves," added Dr. Sacks, professor of cardiovascular disease prevention at the Harvard School of Public Health in Boston.

In one study, a low-carbohydrate ketogenic (Atkins) diet produced a greater degree of weight loss over 6 months than did a low-fat diet. But the ketogenic diet was associated with more adverse events, including constipation, halitosis, myalgia, and headache (Ann. Intern. Med. 2004;140:769-77).

In a separate, 1-year trial comparing a low-carbohydrate Atkins-style diet with a low-fat diet, patients on the former lost weight more quickly during the first 6 months, but then began to gain it back. Patients on the low-fat diet had a steady and continual decline in weight over 1 year, with the two curves converging so that weight loss between the groups was similar at the end of the study (Ann. Intern. Med. 2004;140;778-85).

"You wonder if the curves are going to converge at some point, and is the tortoise going to catch up with the hare," Dr. Sacks said in commenting on that study.

Dr. Sacks and his colleagues took a different approach in a 2001 pilot study that compared a Mediterranean-style diet with moderate fat levels to a low-fat diet (Int. J. Obes. Relat. Metab. Disord. 2001;25:1503-11).

Dieters in both groups lost a mean of about 13.5 pounds within 6 months. But patients on the low-fat diet began to regain more weight, and at 18 months their mean weight loss was only about 6 pounds from baseline, while patients on the moderate-fat diet maintained a mean weight loss of 11 pounds from baseline. Only 20% of patients randomized to the low-fat diet were still on it 18 months later, compared with 54% of those randomized to the moderate-fat arm. In both arms, patients who dropped out had a net gain of 9 pounds over starting weight at 18 months, while those who stayed in the program—low-fat or high-fat—had a net loss of 11 pounds.

A common problem with comparative weight-loss trials is that there is no obvious pattern of results favoring a specific fat, carbohydrate, or protein content for weight loss. Also, many diets induce weight loss over 3-6 months, but the loss is not sustained for 1 or 2 years. In addition, up to half of all participants in some studies drop out, and study results may be influenced by the novelty of diets, marketing, or media attention, he said.

To try to cut through the background noise, Dr. Sacks and his colleagues conducted the 2-year PoundsLost study comparing four diets (N. Engl. J. Med. 2009; 360:859-73) The investigators randomly assigned 811 overweight adults to one of four diets, with targeted percentages of energy derived from fat, protein, and carbohydrates, respectively, of 20%, 15%, and 65%; 20%, 25%, and 55%; 40%, 15%, and 45%; or 40%, 25%, and 35%. Foods were similar among the four diets, and participants were offered group and individual weight-loss instruction sessions for the duration of the study.

At 2 years, there were no significant differences in weight loss between the 20% and 40% fat-content diets, 15% and 25% protein-content diets, or 35% and 65% carbohydrate diet. About 80% of all participants completed the study, and satiety, hunger, satisfaction with the diet, and attendance at group sessions were similar among all diet groups. The authors found that educational support was a strong predictor of weight loss, with each session attended associated with an average 0.2 kg weight loss. All of the diets improved lipid levels and fasting insulin levels.

"We feel these results have an optimistic message for people," Dr. Sacks said. "Successful diets for weight loss can be tailored to an individual's personal and cultural preferences to achieve long-term success. It's not so important to focus on particular contents of fat or protein, but more on what people feel comfortable with and can sustain for the long run."

Dr. Sacks reported that he has received consulting fees and/or performed contracted research for ISIS and Genzyme. ■