

# Low Carb Beats Low Fat for Lipids and Weight Loss

BY SHERRY BOSCHERT  
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SAN DIEGO — People on very-low-carbohydrate diets who consumed three times as much daily saturated fat as people on high-carbohydrate, low-fat diets, lost more weight and had twice the reduction in saturated fat levels compared with the latter, according to a report on a small study presented at a symposium on obesity sponsored by the American Society of Bariatric Physicians.

"If you still believe that you are what you eat, [you are] wrong. You are what you save when you eat," because the level of carbohydrate intake dictates how the body makes use of dietary fatty acids, Dr. Stephen D. Phinney said.

Total circulating saturated fats decreased by 57% over the 12-week study on the low-carbohydrate diet and by 24% on the low-fat diet, he reported.

The unpublished data came from a recent randomized study of 40 patients that was led by Jeff S. Volek, Ph.D., of the University of Connecticut, Storrs, with Dr. Phinney and associates.

Two groups of 20 patients (10 men and 10 women in each) with triglyceride lev-

els above 150 mg/dL and low HDL-cholesterol levels (less than 40 mg/dL in men or less than 50 mg/dL in women) were put on either a low-carbohydrate, ketogenic diet or on a low-fat, high-carbohydrate diet.

All of the patients consumed about 1,500 calories per day. The low-carbohydrate diet contained more protein than the low-fat diet (28% of calories vs. 20%, respectively), more total fat (59% vs. 24%), and more saturated fat (37 g/day vs. 12 g/day).

Although people tend to assume that the low-carbohydrate diet "would be dangerous with all that fat," said Dr. Phinney of Elk Grove, Calif., and a professor of medicine, emeritus, University of California, Davis, patients in the low-carbohydrate group lost more weight than did those on the low-fat diet (10 kg vs. 5 kg) and more fat (6 kg vs. 4 kg).

In addition, those on the low-carbohydrate diet also lost more abdominal fat (828 g), compared with those in the low-

fat diet group (526 g).

Besides fat loss, water loss accounted for most of the weight loss, he said.

The study results suggested benefits in lipid levels, Dr. Phinney reported. Triglyceride levels decreased by 51% on the low-carbohydrate diet and by 19% on the low-fat diet. HDL-cholesterol levels increased by 13% on the low-carbohydrate diet and remained essentially unchanged on the low-fat diet.

There were no significant differences between groups in LDL-cholesterol levels,

although LDL-cholesterol particle size increased by 3% in the low-carbohydrate group and did not change in the low-fat group. This may be significant because smaller, denser LDL particles increase cardiovascular risk, said Dr. Phinney.

Saturated fats as a percentage of triglycerides decreased by 12% in the low-carbohydrate group and by 5% in the low-fat group.

Fatty acids esterified to cholesterol ester decreased by 10% in the low-carbohydrate

group and by 5% in the low-fat group.

"So it's a uniform decrease in both compartments of circulating lipids," he said.

Dietary saturated fatty acids seem to be of much less concern when consumed during a carbohydrate-restricted diet, Dr. Phinney explained.

"The human machinery [seems to be] well equipped to handle this kind of diet," he said.

He also reviewed separate data showing that serum cholesterol levels tend to decrease during weight loss of up to 10% of body weight in people on low-carbohydrate diets.

Total cholesterol and LDL-cholesterol levels then rise transiently as weight loss approaches 20% of baseline body weight, but lipid levels stabilize (with decreases in LDL cholesterol and increases in HDL) when the patient switches to a maintenance diet.

"If you look at cholesterol during weight loss, this can be alarming, but it's pre-owned" cholesterol that was stored in fat cells and is secreted into plasma during weight loss on low-carbohydrate diets, he explained. Return to a maintenance diet should stabilize lipid levels, he noted. ■

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## Insulin Resistance May Increase Spontaneous Abortion Risk

BY BARBARA RUTLEDGE  
Contributing Writer

Insulin resistance may be an independent risk factor for spontaneous abortion in women who undergo treatment for infertility, Dr. Li Tian of Beijing University and colleagues reported.

The researchers examined the incidence of spontaneous abortion among ethnic Chinese patients who became pregnant following assisted reproductive technology (ART) treatment at the Reproductive Medicine Centre of Beijing University. The study population consisted of 107 patients who successfully conceived, among 327 women who underwent in vitro fertilization or intracytoplasmic sperm injection at the clinic from June 2003 to July 2005 (J. Clin. Endocrinol. Metab. 2007 Jan. 23 [Epub doi:10.1210/jc.2006-1123]).

All patients undergoing ART treatment were tested for insulin resistance before initiating pituitary suppression with a gonadotropin-releasing hormone agonist prior to follicle-stimulating hormone/human chorionic gonadotropin stimulation. Insulin resistance was defined using a homeostasis model, and calculated as the product of fasting insulin and fasting glucose concentrations, divided by 22.5. Patients with an insulin resistance index of greater than 4.5 were considered to have insulin resistance.

The mean age of the study population was 30.8 years (range: 21-39 years), and mean body mass index (BMI) was 22 (range: 16-33). Nineteen women were con-

sidered obese, with a BMI of 25 or greater, and 13 women had polycystic ovarian syndrome (PCOS). None of the women had type 2 diabetes, but 23 patients were considered insulin resistant.

Nineteen patients (17.8%) experienced spontaneous abortion. Eleven of 23 patients with insulin resistance (47.8%) had spontaneous abortion, compared with 8 of 84 patients without insulin resistance (9.5%). Overall, patients with insulin resistance had a greater than eightfold increased risk of spontaneous abortion, compared to patients without insulin resistance (odds ratio, 8.32).

In logistic regression analysis, advanced age (35 years or older), high BMI (25 or greater), and PCOS were all factors positively associated with increased risk of spontaneous abortion, but none was associated with significantly increased odds ratios. Only insulin resistance was significantly associated with increased risk of spontaneous abortion, and the association remained significant after controlling for possible confounding effects of advanced age, high BMI, and PCOS.

"Increased insulin resistance may be an independent risk factor for spontaneous abortion after ART treatment," concluded the study authors. "Patients with high insulin resistance should be advised before ART treatment regarding the need of weight reduction or taking metformin, in order to reduce their risk of spontaneous abortion."

The authors reported no conflicts of interest. ■