

## Greater Reduction in Inflammatory Markers with a Low Carbohydrate Diet than

### with a Calorically Matched Low Fat Diet

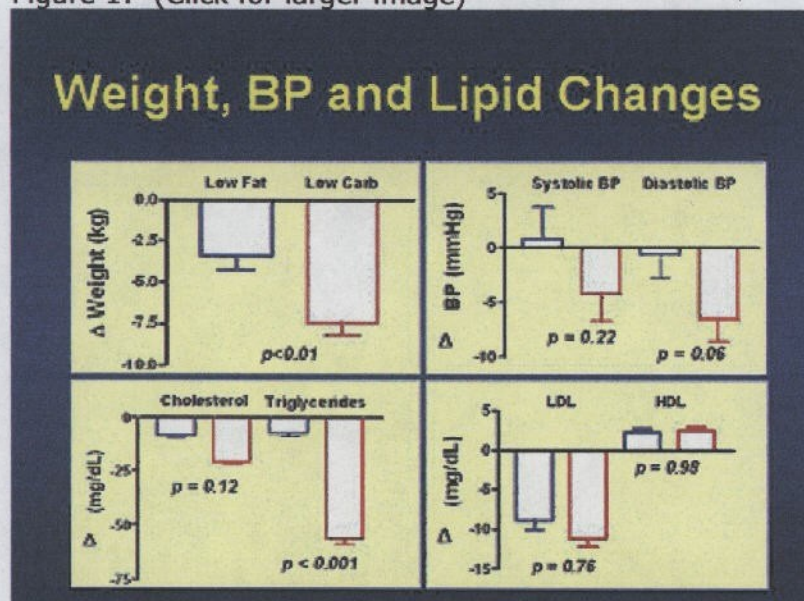


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**Disclosure:** No relationships to disclose

Contradicting expectations, short-term adherence to a low-carbohydrate diet led to greater reductions in markers of inflammation than did a low-fat diet in a small clinical study of obese women. Both C-reactive protein (CRP) and serum amyloid A (SAA) decreased more with the low-carbohydrate diet. "The findings were surprising because they were completely the opposite of what we expected to find on the basis of animal studies and even on the basis of previous studies in humans, showing that people on a low-fat diet have reduced CRP levels," said Kevin O'Brien, MD, associate professor of medicine at the University of Washington in Seattle. "At the very least, the results suggest that we cannot dismiss alternative diets completely out of hand. Maybe we need to tailor the type of dietary prescription to what an individual patient might best be able to follow." Between 1990 and 1999, the prevalence of obesity in the United States increased by 67%. The increase was accompanied by growing interest in weight-loss therapy, especially dietary regimens that differ substantially from diets that emphasize limitations on intake of dietary fat, such as the American Heart Association and American Diabetic Association dietary recommendations. However, alternative diets have never been rigorously tested, said Dr. O'Brien. In particular, alternative diets have not been carefully tested against standard low-fat diets. In the absence of data from comparative trials, concern has arisen about potential adverse effects of alternative dietary regimens, especially low-carbohydrate diets. "We have a generalized idea that fat in the diet is bad," he said. "We were absolutely convinced that we would find some parameter that showed a disadvantage of the low carbohydrate diet compared to the low-fat. Of all the parameters we looked at, we could not find a single one that showed the low-fat diet was superior." The findings came from a randomized comparison of two dietary regimens in obese women. Dr. O'Brien reported data on the effects of the diets on inflammatory markers. Another report, focused on the effects of the two diets on weight loss, lipids, blood pressure, and other coronary risk factors was presented recently at the American Dietetics Association meeting in Philadelphia. Dr. O'Brien reported findings on 41 women who had a mean body mass index was 33.6 kg/m<sup>2</sup>. The women were randomized to one of two calorie-restricted dietary regimens, containing approximately 1200 kcal/day. One group followed a diet that derived approximately 50% of calories from carbohydrate, 30% from fat, and 15% from protein. The other patients were assigned to a diet that emphasized carbohydrate restriction, 20 g/day for one week, followed by 40-60 g/day thereafter in the presence of ketosis by urinary self-testing. The patients were followed for 6 months, during which time a variety of parameters were evaluated, including weight, blood pressure, lipids, and inflammatory markers. Dr. O'Brien presented 3-month findings on inflammatory markers. At baseline, the women had similar diets that derived 47% of calories from carbohydrate, 37-38% from fat, and 15-16% from protein. Caloric intake averaged 1600-1700 kcal/day. After 3 months on the assigned dietary regimen, women in the low-fat group had a mean carbohydrate intake that accounted for 54% of calories, fat intake accounting for 28% of calories, and protein accounting for 18% of calories. In the low-carbohydrate group, 15% of calories came from carbohydrate, 57% from fat, and 28% from protein. "By any recognized dietary standard, the women on the low-carbohydrate



diet were consuming a large proportion of their calories as fat," said Dr. O'Brien. Both diets had favorable effects with respect to weight loss, blood pressure, and lipids. However, to the surprise of the investigators, the low-carbohydrate diet appeared to outperform the low-fat diet on every parameter. The Atkins-type diet resulted in significantly greater weight loss and triglyceride reductions, and the reduction in diastolic blood pressure showed a strong trend in favor of the low-carbohydrate diet. Figure 1: (Click for larger image)



With respect to inflammatory markers, patients on the low-carbohydrate diet also fared better. The median log CRP was 0.54 at baseline. The median was unchanged after 3 months in the low-fat group (-0.01), whereas patients in the low-carbohydrate group experienced a significant decline of -0.16. However, the difference in log CRP change between the two diet groups did not reach statistical significance. SAA levels were similar at baseline (0.70) and decreased slightly (-0.03) after 3 months in the low-fat group. In contrast, patients randomized to the low-carbohydrate diet had a decrease in serum log SAA level (-0.10) that was significantly greater than that of patients who followed the low-fat diet. "Contrary to our hypothesis, patients on the low-carbohydrate diet had significantly greater weight loss and reduction in triglyceride levels and similar reductions in blood pressure and in total and LDL cholesterol," said Dr. O'Brien. "The low-carbohydrate diet was associated with a significantly greater decrease in serum amyloid A, and there was a trend toward a greater decrease in CRP levels." The results should not be interpreted as an endorsement of a low-carbohydrate diet, Dr. O'Brien emphasized. Instead, the results indicate a need for long-term studies to evaluate the effects of a low-carbohydrate and other diets on cardiovascular risk factors. "People can lose weight on a lot of diets over the short term," he said. "However, a 3-month study like this one really doesn't address the issue of whether people are able to maintain weight loss with this diet better than people can with a low-fat diet. The results do not mean that a low-carbohydrate diet will be superior over the long term."