LETTERS TO THE EDITOR


Reply to J Brand-Miller

Dear Sir:

We were surprised to read that Brand-Miller finds our title and conclusion too decisive, because we merely stated the findings of our study (both the pros and the cons of low-glycemic-index diets) and specifically pointed out the time frame of 10 wk. Furthermore, we stated that more studies are needed to substantiate our findings.

We deal with the questions raised by Brand-Miller as follows:

We found a significant 10% decrease in LDL cholesterol in the low-glycemic-index group compared with a 2% increase in the high-glycemic-index group. This difference cannot be explained by changes in fat mass, as suggested by Brand-Miller, because we observed no correlation between changes in fat mass and changes in LDL cholesterol (total fat mass: \( r = 0.17, P = 0.27 \); trunk fat: \( r = 0.09, P = 0.56 \)). Nor does inclusion of changes in total or trunk fat mass in the covariance analysis change the significance of the diet effect on LDL cholesterol.

Regarding the power in the study, these calculations were made before the study on the basis of body weight. A postexperimental calculation of power as suggested by Brand-Miller is not appropriate according to an article published in American Statistician (1). As stated in our discussion, we agree with Brand-Miller that a longer study period or inclusion of more subjects might have resulted in a significant difference in body weight. Nevertheless, we maintain that our finding of no significant difference in body weight loss after 10 wk with 22–23 subjects per diet group does at least question the clinical relevance of the glycemic index in body weight control. Furthermore, existing evidence that low-glycemic-index diets are an effective tool for achieving weight reduction is, at present, contradictory (2).

In response to Brand-Miller’s request for data more indicative of visceral fat changes, we reanalyzed our dual-energy X-ray absorptiometry measurements on trunk fat. We found no significant difference between the high-glycemic-index and low-glycemic-index group in trunk fat mass decreases from week 0 to week 10 (low-glycemic-index: \(-0.45 \pm 0.18 \) kg; high-glycemic-index: \(-0.18 \pm 0.20 \) kg; \( P = 0.65 \)). Nor did we find any significant difference between groups in waist circumference changes (low-glycemic-index: \(-1.9 \pm 0.7 \) cm; high-glycemic-index: \(-1.1 \pm 0.7 \) cm; \( P = 0.47 \)).

Brand-Miller also advocates the use of in vivo measurements of glycemic index, but if the glycemic index concept is to make any sense as a tool for consumers, in vivo analysis cannot be a prerequisite for composing a low-glycemic-index diet. Moreover, this requirement is not consistent with Brand-Miller’s own practice. For example, in vivo analysis was not an inclusion criteria in her previously published meta-analysis (3), in which not even in vitro measurements of glycemic index were a requirement. A hydrolysis index of the test foods was the basis for the glycemic index calculation in our study. This method correlates well with in vivo glycemic index determination, especially for starch-rich products such as those used in our study (4, 5). Another laboratory also analyzed the carbohydrate quality of our test foods by using the Englyst method, and the results from this analysis support earlier findings with use of the hydrolysis index method. We also calculated the mean glycemic index value of the 2 groups of test foods with the use of the latest international tables of glycemic index and glycemic load values and found a mean difference of 34.5 units. However, we do agree that it is difficult to predict the glycemic index of a mixed diet from the glycemic index values of the individual food items from table values. Last, we argue that the significant difference in LDL cholesterol between the 2 groups is a good marker for a true difference between the 2 groups of test foods, because the study was designed so that everything other than the glycemic index was similar in the 2 groups.

As reported in our paper, some subjects found the amounts of test food too high (not “far too high” as stated by Brand-Miller). This was not a complaint that continued throughout the study period, but a statement made mostly during the first week of the study period, and for most subjects, it was only addressed when specifically requested. It is not unusual for overweight subjects to complain about quantities of food when they are served low-fat, high-carbohydrate diets that have a high dietary fiber content because these diets are probably more satiating than the subjects’ habitual diets (6).

The dietary instructions were necessarily strict because we wanted to control the glycemic index and macronutrient composition of the subjects’ diets to effectively compare the effects on energy intake of a low-fat, high-carbohydrate diet with either a low or a high glycemic index. However, energy intake was not restricted; we merely supplied the subjects with carbohydrate-rich test foods comprising \( \approx 49\% \) of their estimated total energy intake. Dietary record data from weeks 5 and 10 clearly show that the test foods provided were only part of the subjects’ diets, as intended.

Finally, Brand-Miller suggests performing an intention-to-treat analysis on body weight changes. As could be expected, this analysis only reduces the difference between the 2 groups and increases the \( P \) value (low-glycemic-index, \(-1.55 \pm 0.44 \); high-glycemic-index, \(-1.19 \pm 0.29 \); \( P = 0.57 \)).

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REFERENCES
3. Brand-Miller J, Hayne S, Petocz P, Colagiuri S. Low-glycemic index
More support for dietary patterns involving high-fiber, high-complex carbohydrates

Dear Sir:

The experimental design of Gerhard et al (1) was refreshingly respectful of normal patterns of eating by examining the effects of varying macronutrient composition on serum lipids under ad libitum eating conditions and by varying the content of dietary fiber proportional to the amount of carbohydrate in each diet. In keeping with what one would expect from a dietary pattern similar to the high-fiber, low-fat diets consumed for millennia by Mediterranean and Asiatic peoples, the results of adopting a high-carbohydrate (65% of energy) diet yielded more desirable glucose and triglyceride concentrations. These findings appeared to be in contrast with previous studies in which the effects of adopting a high-carbohydrate diet were examined only under ischemic eating conditions and were found to yield less desirable serum glucose and triglyceride concentrations.

The authors might not have been as surprised by their results had they cited a couple of pertinent studies. One of these studies reported the clinical experience of 652 diabetic inpatients consuming a complex carbohydrate (70–75% of energy), low-fat diet ad libitum continuously for 3 wk. Barnard et al (2) reported a 33% decrease in serum triglyceride concentrations with this diet. A second, less obviously pertinent, study (3) was conducted, ironically, by the authors of one of the isocaloric macronutrient comparisons tested in diabetic patients. Garg et al (4) contrasted a high-carbohydrate (55% of energy) diet with a high-monounsaturated-fat diet (40% of energy from carbohydrate) under isocaloric conditions and purported to show that diabetic patients who adopted a high-carbohydrate diet experienced an undesirable 24% increase in serum triglyceride concentrations. A critique of this study (5) pointed out that the observed rise in serum triglyceride concentrations with their high-carbohydrate diet could have been an artifact of the isocaloric design of the study and a consequence of the authors failing to increase the dietary fiber intake commensurate with the increase in carbohydrate intake. In a study designed to test this critique, Chandalia et al (3) reported that the adoption by diabetics of a diet providing 30 g fiber/d (and 55% of energy from carbohydrate) for 6 wk was associated with a desirable 10.2% decrease in plasma triglyceride concentrations.

Despite these supportive studies validating the results of Gerhard et al, readers might still wonder about the long-term clinical applicability of their 6-wk findings to community-living diabetics. Fortunately, Esposito et al (6) recently reported that Europeans diagnosed with the metabolic syndrome and randomly assigned to a high-carbohydrate (50–60% of energy), Mediterranean-style diet were able to adhere to it for 2 y, with salutary consequences for markers of vascular function, a 12% decrease in serum triglyceride concentrations, and a 5.4% decrease in body weight. The consumption of complex carbohydrates with high contents of intact fiber and water, as is characteristic of classic Mediterranean and Asian diets, appears to yield salutary benefits with respect to serum triglyceride concentrations and long-term weight control that appear to be sustainable long-term by adults at risk of diabetes.

The author consults occasionally for the Pritikin Longevity Center, a residential lifestyle change rehabilitation center that features a high-carbohydrate, low-fat diet.

William J McCarthy

REFERENCES

Reply to W J McCarthy

Dear Sir:

We thank McCarthy for his comments regarding our study “Effects of a low-fat diet compared with those of a high–monounsaturated fat diet on body weight, plasma lipids and lipoproteins, and glycemic control in type 2 diabetes” (1). We agree that the results from the studies of Barnard et al (2, 3) are consistent with our findings. In those studies, the amount of dietary fat was limited to 10% of total energy, and the amount of carbohydrate was very high—75% of energy. In our study, dietary fat was restricted to 20% of total energy, and carbohydrate provided 65% of energy. This contrasted with the high–monounsaturated fat group of our study, who consumed 40% of energy as fat. There are at least 2 important effects of a high dietary fat consumption: one direct and one indirect. Unlike carbohydrate, except for fructose, dietary fat does not induce satiety; thus, the hormonal cues to stop eating are not operative (4). In our study, the diabetic subjects on the low-fat diet consumed 212 kcal less energy than they did on the high–monounsaturated fat diet. They then lost 1.53 kg of weight from the low-fat diet because of this energy deficit. Second, if less dietary fat is consumed, carbohydrate-containing foods rich in fiber and water can be increased. High-carbohydrate diets do induce satiety (4). The high-fiber content of the high-carbohydrate diet promotes weight loss and better lipid and