

Considering Options for Attenuating Postmeal Glucose Excursions

Attenuating postmeal blood glucose excursions is a clinical challenge. While strategies for modifying the quantity and quality of carbohydrate consumed are widely used to reduce postprandial blood glucose peaks, we have paid relatively little attention to how premeal snacks and their composition may alter meal responses. In this issue, Chen et al. (1) reported that feeding a snack of soybeans (30 g) and yogurt (75 g) 2 h before breakfast lowered the post-breakfast blood glucose excursion by 40%. While their article did not provide the macronutrient composition of the snack, it was described as a high-protein, low-carbohydrate snack.

Chen et al. (1) appear to attribute the glycemic effects of the soy-yogurt primer to its high-protein, low-carbohydrate composition. However, they also mention that the suppression of postprandial free fatty acids of the snack was similar to the effects of arginine infusion in previous research from their laboratory (2). This line of research raises interesting questions about the role of insulin secretion and postprandial free fatty acid levels in creating the second-meal effect. Other research has addressed the longer-term metabolic effects of high protein intake and the variability in the effects of milk proteins (casein or whey) and specific amino on glycemia and regulators of glycemia (3–5). Reported benefits of high-protein, low-carbohydrate diets included reducing serum triacylglycerol, increasing HDL cholesterol, increasing LDL particle size, reducing blood pressure, reducing fasting and postprandial blood glucose, improving insulin response, and reducing glycated hemoglobin (6).

Examining how the amount and type of protein may alter metabolism in the management of diabetes is intriguing. Mortensen et al. (7) have reported that adding whey to a high-fat meal blunts the postprandial lipemic response more than casein or the other proteins that were evaluated. Their whey feeding also resulted in a significantly lower area under the curve for

glucose response with a trend for lower response for gastric inhibitory protein (GIP) response and higher response for glucagon-like peptide 1 response. While much of this research that has been conducted is small sample studies, investigation of how the properties of food may affect metabolic modulators such as gastric inhibitory protein and glucagon-like peptide 1 may change how we look at nutrition with regard to diabetes management in the future.

The dairy industry has been examining methods to increase the whey content of yogurts in the development of probiotic functional foods for over a decade (8). Future research will need to determine whether there is any potential benefit of premeal snack primers such as soy-yogurt or from functional foods rich in whey with regard to diabetes medical nutrition therapy. If such strategies prove to be beneficial metabolically, we will then consider behavioral intervention strategies to help people incorporate these foods into their approaches for glucose control.

Strategies to reduce postprandial blood glucose excursions usually involve self-monitoring of blood glucose before and after meals (9). In patient-center counseling, self-monitoring of blood glucose can address self-perception, self-reflection, and self-regulation (10). Health providers can discuss patient food and glucose monitoring diaries to elicit perceptions about how glycemic control is related to concerns about threats posed by diabetes (e.g., short- and long-term complications). Discussing lifestyle in relation to glucose values encourages patients to reflect and understand the causes of glycemic fluctuation. Brainstorming approaches with the patient that would improve metabolic control encourages self-regulation in relation to how to reduce the impact of postmeal blood glucose excursions. The findings from the study by Chen et al. (1), if corroborated, will increase patients' options for managing their glucose control.

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