Exercising tactically for metabolic control

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TO THE EDITOR: After decades of studies showing moderate aerobic exercise done during the mid-postprandial period improving blood glucose and triglycerides, it is gratifying to note that resistance exercise under similar conditions also offers similar results. Heden and colleagues (1) find resistance exercise at the 45-min postmeal mark more effective than premeal resistance exercise in lowering glucose and triglycerides. I have two observations to make in this context.

1) Now we can directly compare the effect of resistance exercise (1), high-intensity exercise (2), and moderate aerobic exercise by Larsen and colleagues (2), all starting at 45-min postmeal, on glycemia. The postmeal glucose iAUC values for the three trials are lower by 30, 27, and 50%, respectively, indicating that the effect of resistance exercise (1) is closer to that of the high-intensity exercise (2). The secondary peak that forms after the activity stops, the 4-hour glucose value, and the postmeal glucose iAUC are much better in the aerobic trials. Larsen and colleagues use the same energy expenditure for their two studies, and it is the moderate intensity trial that offers the better glycemia. Other studies—at 30-min postmeal, 45-min postmeal, and 60-min postmeal—also demonstrate that when different intensities are compared at the same exercise timing, glycemia is usually better at the lower intensity. It could be that exercise intensity makes the difference: in addition to the glucose still arriving from the gut, extra hepatic glucose production is triggered in response to activities at higher intensity, leading to the observed postexertion glucose elevation. Although higher intensity improves body composition, physical fitness, and insulin sensitivity, patients with diabetes need to be mindful of the glycemic consequence of exaggerated counterregulation.

2) My second concern is about the common practice of using incremental AUC values with various baselines. Jettisoning part of the actually observed results, as iAUC does, opens the way to any number of other arbitrary, calculation-dependent outcomes. The impetus here appears to be that through calculation shopping “less prominent differences” could be made to look otherwise (3). This practice is analogous to depicting the per capita incomes of the residents of Canada (US $37,000) and the United States (US $43,000) on a vertical bar chart with a baseline starting at US $31,000 and then intimating that people in the United States are twice as wealthy as Canadians. Regardless of the perceived utility and apparent success of incremental AUC calculations, it remains that total AUC is the legitimate way to go.

On balance, a timely moderate postmeal exercise is what helps with glucose control, a fact known for at least three decades now. Indications are that a combined endurance and resistance training at <80% \( \bar{V}_{O_2} \text{max} \), three times a week, improves body composition, physical fitness, and metabolic parameters. As the authors point out, lifestyle studies involving postmeal resistance exercise would be beneficial.

DISCLOSURES

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