Effect of Exercise Timing on Postprandial Lipaemia

Re: Acute effects of shortly pre- versus postprandial aerobic exercise on postprandial lipoprotein metabolism in healthy but sedentary young women

Dear Editor,

We read with interest the recent article in the Journal by Hashimoto and colleagues examining the effect of 30 minutes of moderate-intensity aerobic exercise, taken 20 minutes after (Experiment 1) or 50 minutes before (Experiment 2) ingestion of a fat test cream, on postprandial lipoprotein responses in young, healthy, sedentary Japanese women. The key findings were, in comparison with a rest control trial: 1) moderate-intensity walking performed 20 minutes after consuming the test meal lowered postprandial apolipoprotein B-48 concentrations, but not postprandial triacylglycerol or remnant-like particle-triaclylglycerol concentrations; and 2) moderate-intensity walking performed 50 minutes before consuming the test meal had no effects on postprandial apolipoprotein B-48, triacylglycerol or remnant-like particle-triaclylglycerol concentrations. Hashimoto and colleagues stated that, 'The major finding of this study is that postprandial aerobic exercise is more effective than preprandial exercise shortly before fat ingestion for the amelioration of postprandial lipemia.' (the first sentence of the discussion). We would like to offer some comments regarding the issue of exercise timing.

Evidence favouring the effect of aerobic exercise performed shortly before compared with after the consumption of fat test meals on postprandial triacylglycerol concentrations is unclear. Hashimoto and colleagues cited one investigation in young healthy men which found that both preprandial and postprandial exercise was equally effective in ameliorating postprandial triacylglycerol concentrations. However, data from another randomised crossover trial in young recreationally trained men suggests that exercise taken 1 hour post-ingestion of a high fat meal is less effective than exercise taken 1 hour before consumption of the same meal. Thus, previous work in this area in healthy populations is divided. One interesting aspect of the study by Hashimoto and colleagues, which may explain some of the different findings, was the use of a smaller fat load (0.35 g fat per kg body weight) than is typical in many studies (1-1.5 g per kg body weight). Certainly, at least one other study has shown that postprandial triacylglycerol responses were not significantly reduced in young men by up to 90 minutes of moderate-intensity exercise performed immediately before consumption of two sequential test meals of moderate fat content.

We think, however, that timing may not be the most important factor in the reduction of postprandial lipaemia as long as exercise is performed regularly. We previously demonstrated that exercise taken intermittently throughout the day, before and after consumption of test meals, reduces day-long triacylglycerol concentrations. Other researchers have demonstrated reductions in postprandial triacylglycerol concentrations when exercise was performed both before and after the consumption of test meals. Moreover, meta-analysis found no effect of exercise timing on postprandial triacylglycerol concentrations as long as the exercise was taken <24 hours before consumption of the test meal. Finally, we (M. Miyashita and S.F. Burns) recently demonstrated that older adults who meet physical activity guidelines for health (i.e. 150 min/week) have a lower postprandial lipemic response than those who do not meet these guidelines. Thus, regular exercise/physical activity may be important in keeping circulating concentrations of postprandial triacylglycerol low.

One final point is that from a purely practical standpoint, Hashimoto and colleagues state that, 'It is difficult for individuals to realize the effects of exercise performed several hours before a meal (usually on the previous day), while it is easier for individuals to accept that exercise shortly after a meal can mitigate postprandial lipemia.' We argue that, whilst this may be true, it should be considered that postprandial exercise of moderate intensity or higher is possibly less enjoyable than exercise undertaken in the post-absorptive state due to the feelings of fullness and perhaps postprandial lethargy, which are associated with the digestion of recently ingested food.

References

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