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But how much physical activity?[1,2]

Dale A Schoeller

One of the most difficult questions encountered in clinical nutrition is "how much?" The prescription of increased physical activity to improve the efficacy of obesity treatment with regard to weight loss is so common that it can be considered "textbook" knowledge, but the issue of the appropriate amount of physical activity to prescribe is far more complex.

Retrospective studies of weight loss have generally found that persons who are successful in achieving a weight loss that is retained after 6, 12, or more months are more physically active than are those who fail to maintain their weight loss, but many of these studies, as recently reviewed by Anderson et al (1), did not offer quantitative information on the amount of exercise. In a similar vein, Pavlou et al (2) prospectively showed that they could effectively switch off and on weight regain after an initial dietary weight loss by starting and stopping, respectively, the patient's regular participation in exercise, but, again, the question of how much could not be addressed without undue experimental complexity.

Only in the past decade did investigators begin to investigate how much exercise is required to maintain weight loss over the long term. Klem et al (3) performed a retrospective analysis of the exercise habits of subjects in the National Weight Control Registry and found that those persons who successfully maintained long-term weight loss reported an energy expenditure of 2800 kcal/wk. Using more objective measurement methods, Schoeller et al (4) performed a cross-sectional study, in which an energy expenditure of 2400 kcal/wk was associated with improved 12-mo weight-loss maintenance. In an unusual display of consistency across studies, Jakicic et al (5) also performed a retrospective analysis of the amount of physical activity reported by participants in a diet and exercise study and found significantly better 12- and 18-mo weight-loss maintenance among those who reported an energy expenditure of 2200 kcal/wk than among those who reported an energy expenditure of only 1300 kcal/wk.

Despite the quantitative agreement among the above 3 studies, none of them prospectively tested the efficacy of a prescription of the amount of physical activity for long-term weight loss. Jeffery et al (6) compared the efficacy of 2 physical activity prescriptions in a weight-loss treatment combining diet and exercise, and their report is published in this issue of the Journal. One group of participants (n = 93) was asked to initiate a physical activity program with an energy expenditure goal of 1000 kcal/wk, and the other group (n = 109) was given an energy expenditure goal of 2500 kcal/wk; both groups received a prescription to restrict energy intake to 1000–1500 kcal/d with 20% of energy from fat. At 6 mo, there was no difference in weight loss between the groups, but, between 6 and 12 mo, the high physical activity (HPA) group maintained their weight (0.5 kg gain in 6 mo), whereas the low physical activity (LPA) group had a 2-kg regain. The difference in rate of regain disappeared during the interval between 12 and 18 mo, but the HPA group still had a significantly greater mean (±SD) weight loss at 18 mo than did the LPA group (6.7 ± 8.1 compared with 4.1 ± 8.3 kg). Compliance with the physical activity prescription was very good. According to their self-reporting, the LPA group actually exceeded their prescription by ≈500 kcal/wk on average, whereas the HPA group fell short of their goal by 100–200 kcal/wk.

As noted, Jeffery et al found no difference in weight loss at 6 mo, although the HPA group averaged a 0.9-kg greater loss (NS). This is consistent with findings in a large body of literature comparing short-term weight loss for dietary restriction with and without exercise (7). Only meta-analysis reveals the fact that the added physical activity does indeed lead to a fat loss that is significantly greater by ≈1 kg, although weight-loss differences are small or not significant (8). The small size or absence of the short-term effect appears counterintuitive, but it should be remembered that the various amounts of physical activity add only 100–350 kcal/d to energy expenditure, whereas the energy-restricting diets reduce energy intake by 900–1600 kcal/d. The energy deficit from energy restriction, therefore, far exceeds that from added physical activity, and the small added deficit from physical activity is lost quickly in the variance with respect to individual compliance.

However, Jeffery et al did not simply prescribe an energy expenditure goal of 2500 kcal/wk. Participants were also provided social support in the form of friends and family who were allowed to enroll in the treatment, exercise coaches, and a small monetary inducement. With these special inducements, self-reported compliance with the exercise prescription was excellent in the HPA group. The proportion of HPA group participants who completed the 18-mo study was 70%, and the proportion of LPA group participants who completed the study was 78%.

Although it was concluded by Jeffery et al that an energy expenditure prescription of 2500 kcal/wk or ≈75 min of brisk walking/d is effective for long-term weight loss, the efficacy waned during the period between 12 and 18 mo. This finding is almost identical to the findings of Jakicic et al (5). Inspection of the self-reported energy intake and physical activity amounts reported by Jeffery et al provides no indication of why the HPA group began to regain weight. They did not report mean increases in energy intake or reductions in physical activity. Indeed, both

[1] From the Department of Nutritional Sciences, University of Wisconsin-Madison, Madison.

[2] Reprints not available. Address correspondence to DA Schoeller, Department of Nutritional Sciences, University of Wisconsin-Madison, 1415 Linden Drive, Madison, WI 53706. E-mail: dschoell@nutrisci.wisc.edu.

values trended in the opposite direction. This failure to identify the component of energy balance that changed is probably a limitation of self-reporting. Both self-reported energy intake and physical activity are subject to misreporting in studies of weight loss (9, 10). This should not detract from the importance of the findings of Jeffery et al but, rather, should provide motivation for further studies using more objective measures of energy balance that can answer the question of which treatment component is subject to the faltering compliance that leads to weight regain.

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