ΕΛΛΗΝΙΚΗ ΕΠΙΘΕΩΡΗΣΗ ΔΙΑΙΤΟΛΟΓΙΑΣ-ΔΙΑΤΡΟΦΗΣ 2011, 2(2), 73–77

Review

Dieting, weight & exercise
Finding a healthy balance

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ABSTRACT We've all heard (and may have offered) the advice: If you want to lose weight, simply eat a little less and exercise a little more. But if eating less and exercising more is so "simple," why are we still dealing with an obesity epidemic? Do we need to rethink our messages? This talk will focus on dieting and exercise myths that perpetuate difficulty with weight reduction: **Myth 1**: *The more you exercise, the more fat you will lose*. False. The more you exercise, the more likely you are to compensate with reduced activity the rest of the day. Dieters need to become more aware of their 24-hour energy expenditure, not just the time spent exercising. **Myth 2**: *To lose 0.5 kg body fat per week, a dieter needs to reduce food intake by 2 MJ (500 kcal) per day*. False. The number of MJ that contributes to fat loss depends on how much fat the person has to lose, with an obese person losing fat faster than a lean person. While a 2-MJ per day deficit may be a standard weight reduction prescription, would a smaller deficit be more sustainable, hence more successful? The session will conclude with information about gastric bypass athletes. An estimated 6% of gastric bypass patients become highly active and train for marathons, triathlons, and other endurance events. As health professionals, we need to be aware of this emerging clientele, understand their sports nutrition issues, and help them stay out of the medical tents.

Key words: Weight loss theories, weight reduction, exercise for weight loss, obesity epidemic, gastric bypass athlete.

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INTRODUCTION

We've all heard (and may have offered) the advice: If you want to lose weight, simply eat a little less and exercise a little more. But if eating less and exercising more is so "simple," why do so many people struggle to lose undesired body fat? And why are we still dealing with an obesity epidemic? Perhaps we need to rethink our messages.

This article will focus on two dieting and exercise myths that perpetuate difficulty with weight reduction:

Myth 1: *The more you exercise, the more fat you will lose.*

Myth 2: *To lose 0.5 kg body fat per week, reduce food intake by 500 kcal (2 MJ) per day.*

The article ends with information about the emerging population of gastric bypass endurance athletes. These dedicated athletes struggle with finding the right balance of diet and exercise. They need –and welcome– support for learning how to fuel themselves adequately. With proper nutrition education, they will be able to enjoy exercise for both the short- and long-term. Sports nutrition education can also help them stay out of the medical tents at endurance sport events such as marathons and triathlons.

Myth 1: The more you exercise, the more fat you will lose

Some people seem to easily lose weight with exercise. Others struggle and lose less weight than might be expected based on a theoretical, mathematical approach to fat loss. While poor compliance can account for some of the unachieved weight loss, poor compliance is not always the case.[1] Dieters need to become more aware of their 24-hour energy picture, and not just the time they spend exercising.

Di Blasio et al[2] studied 34 postmenopausal women who participated in a 34-week walking program. They identified two differing responses to the walking program: one group showed reduced spontaneous physical activity, while another group maintained their baseline level of daily activity.

Church et al[3] studied sedentary overweight or obese women who did no exercise (control group) or supervised exercise at 50% VO_2 max for six months. The subjects who exercised for 72 and 136 minutes per week (equivalent to 4 or 8 kcal/kg body weight/week, respectively) lost the predicted amount of weight. In contrast, the group that completed 194 minutes of exercise per week (equivalent to 12 kcal/kg/week) lost only about half of the predicted weight loss. This suggests the subjects compensated in some way to conserve energy and challenges the belief "the more you exercise, the more weight you will lose." The more you exercise, you may end up doing less activity throughout the rest of the day.

Myth 2: To lose 0.5 kg body fat per week, reduce food intake by 500 kcal (2 MJ) per day

Based on the assumption 0.5 kg of fat equates to about 3,750 kcal, reducing energy intake by 500 kcal per day would theoretically equate to losing about 0.5 kg body fat every week. Yet, individual variation impacts ability to lose weight. An obese person tends to lose fat-weight faster than a lean person. The rate of fat loss depends on how much excess body fat a person has to lose.[4]

Dieters lose both muscle and fat; the weight lost by most non-exercising dieters reflects about 70% fat and 30% muscle. Obese dieters, as compared to leaner dieters, lose a greater proportion of fat than muscle, while the lean dieters lose a greater proportion of muscle than fat.[5] Loss of muscle reduces the resting metabolic rate. Exercise can help minimize muscle loss. Hence, dieters who want to be able to maintain a higher calorie intake need to strength-train to protect against muscle loss.

The "500-kcal deficit per day weight loss rule" fails to account for the dynamic physiological adaptations that change both the resting metabolic rate as well as the energy cost of physical activity.[6] While weight loss in overweight and obese people can be almost linear for about six months, these dieters commonly hit a plateau.

The reasons for a weight plateau are unclear. Do the dieters:

- Adhere less strictly to their diet?
- Conserve energy to match their reduced energy intake?
- Fail to not account for reduced energy needs?

Metabolic rate slows by about 18 kcal per kg body weight lost per day. Hence, dieters need to continually consume less energy as they lose weight – or they need to increase their energy expenditure.[4] For example, an obese 115 kg person who loses 45 kg requires about 800 fewer calories per day, as compared to their baseline energy needs.

A helpful tool for predicting rate of weight loss is the Body Weight Simulator (http://bwsimulator.niddk.nih.gov), developed by the National Institute

of Diabetes and Digestive and Kidney Disease of the National Institutes of Health in Washington, DC. The simulator challenges the simplistic, static and erroneous "weight loss rule" that reducing energy intake by 500 kcal (2 MJ) per day will result in slow but steady weight loss of about 0.5 kg per week.[4] By inserting the body weight, desired weight, and time allotted to lose the weight, a person can determine the changing energy deficit needed to reach the goal (assuming perfect adherence).

Sex differences also affect weight loss. The mechanisms that maintain body fat are more effective in women than in men. Even with exercise, women tend to maintain weight. Women commonly experience a post-exercise increase in energy-regulating hormones that stimulate the appetite.[7]

According to Bryant et al,[8] people on a diet and exercise program who fail to lose the expected amount of weight tend to eat more compared to those who do not compensate for the increase in exercise-related energy expenditure. Exercise can trigger hunger, increased energy intake, and may actually contribute to weight gain. Yet, other dieters can tolerate sustained periods of exercise-induced energy deficit.[1]

CONCLUSION

Weight loss is far more complex than eating less and exercising more. Some of the confusion regarding the "best" ways to lose weight can be traced to incoherent obesity research. Current research strategies fail to reflect the complexity of the problem. That is, the psychologists, exercise physiologists, and nutritionists rarely study the same factors.[5] We need to study both the psychological as well as physiological responses to diet and exercise.

Researchers also overlook individual variability; they generally take the average of all the results and report the mean data. Yet the combined response is not representative of all individuals. A group response fails to reflect the true spectrum of weight loss from responders to non-responders.[1,6]

If we, as health professionals, could identify why some people gain weight easily and some lose weight more easily than others, we would be able to improve strategies that promote weight loss and enhance health. While a 500-kcal per day deficit may be the standard weight reduction prescription, would another approach be more successful?

Regardless of weight loss, exercise contributes to very important health improvements. As practitioners, we need to focus more on the health benefits associated with exercise: reduced waist circumference, lower blood pressure, improved aerobic fitness, etc. These are more meaningful outcomes than change in weight.[5] We also need to remember that short-term weight loss does not predict what will happen in the future. We need to better understand obese people and their psychological processes.

Current Diet and Exercise Concern: The Gastric Bypass Athlete

A new type of dieter is appearing in the offices of sports dietitians: people who have undergone gastric bypass and other forms of bariatric surgery. An estimated 6% of gastric bypass patients become "highly active" (as defined by taking ≥12,500 steps/day).[9] While walking is the primary form of exercise for majority of gastric bypass patients, a small subgroup aspire to be more athletic and strive to become marathoners, triathletes, and other types of endurance athletes.

Because some of these novice athletes have had minimal exercise or sports experience earlier in their lives, they may lack knowledgeable about what to eat to fuel their exercise programs. They have questions about hydration, protein, carbohydrates, and fueling before and during exercise. Yet, published sports nutrition guidance for the gastric bypass athlete is lacking. Until more research is done, sports dietitians can only suggest trial-and-error experiments that will help each bypass athlete figure out the best fueling practices for his or her unique and evolving body.

Standard nutrition advice for gastric bypass patients

Bypass patients are given standard nutrition advice[10,11] that often creates confusion and contradictions for their needs as athletes. This standard advice includes:

- *Eat high-protein meals and snacks, targeting 60 to 80 grams of protein/day.* A high protein intake is indeed important to build and repair muscles. Most bypass patients are told to eat protein first and other food groups as room permits in the new stomach pouch. But by focusing on protein, the

bypass athlete may select a diet that lacks the carbohydrates needed to adequately fuel the brain and replenish the depleted glycogen stores that occur with endurance exercise.

- *Avoid concentrated sweets to avoid dumping syndrome*. Endurance athletes commonly consume concentrated sweets in the form of gels and sports drinks that offer 12 to 20 g carbohydrate per 8 ounce serving. A bypass athlete would experience "dumping."
- *Sip fluids, targeting 8 to 12 ounces per waking hour (12 cups/day)*. Bypass athletes who sweat heavily may inadequately replace sweat losses if they cannot tolerate a larger volume of liquid.
- *Do not drink while eating and do not drink for 60 minutes after eating*. This may compromise daily fluid intake and contribute to chronic dehydration.
- *Maintain weight by eating 1,200 to 1,600 calories per day*. Bypass athletes who exercise for an hour or two each day my burn 500 to 1,000 calories on exercise alone. A 1,200 to 1,600 calorie intake would likely result in muscle wasting, depleted muscle glycogen, needless fatigue, and reduced performance – to say nothing of carbohydrate cravings, urges to binge-eat, and lack of enjoyment of exercise.

Suboptimal food and fluid intake

Two major concerns that hinder athletic performance include lack of fuel and lack of fluids. The bypass athlete commonly views food as fattening (as opposed to food being essential fuel) and fails to consume adequate fuel before and during bouts of endurance exercise that last longer than 1.5 to 2 hours.

Bypass athletes commonly get told that they will burn more fat if they exercise without having first eaten. While this may be true, the athletes interpret this to mean they will lose more body fat. Wrong. The truth is creating a calorie deficit by the end of the day determines body fat loss for that day.

Failing to consume appropriate pre-exercise fuel can contribute to reduced stamina and endurance, to say nothing of workouts that feel like drudgery. By consuming 200 to 300 calories, as tolerated, pre-exercise, the bypass athlete will be able to exercise harder and get better results from the workouts. They will also better enjoy their exercise program; this enjoyment will hopefully help sustain an active lifestyle for years to come. Exercise that feels like punishment for having undesirable body fat is unlikely sustainable for the long run.

Replacing sweat losses

Large people commonly sweat heavily during exercise and lose significant amounts of fluid. Hence, bypass athletes should learn their sweat rates by weighing themselves before and after a typical exercise session, being sure to account for fluid consumed during that exercise session. One kilogram (kg) of weight loss represents one liter of sweat loss. Bypass athletes should match that sweat loss, and even target 50% more fluid intake.[12]

Monitoring urine is another way to determine if the bypass athlete has rehydrated with adequate fluids. The goal is to void a significant volume of urine every 2 to 4 hours throughout the day to reach that goal, bypass athletes may need to carry a water bottle with them and continually drink in sips throughout the day to maintain hydration.

- *Fear of eating food/drinking fluids that contribute to dumping syndrome*. Athletes typically eat carbohydrate-rich foods before and during endurance exercise that lasts for more than 60 to 90 minutes, with 75 g of carbohydrates recommended for a 75 kg athlete within the hour pre-exercise and about 60 g per hour during exercise.[10] Bypass athletes commonly choose to avoid foods with 10 or more grams of sugar per portion. This may limit their ability to fuel well before and during endurance exercise. They may also be afraid to re-introduce carbohydrates, if they previously had struggled with a self-defined "carbohydrate addiction"

Each athlete needs to learn which foods and fluids work best for his or her intestinal tract. Some bypass athletes report tolerating sports drinks, gels, and energy bars, whereas others are afraid to eat any carbohydrates. One long distance runner described oatmeal as a "gentle carb" that he tolerated well, but noted that refined sugar and white flour created intestinal problems within half an hour. Dried fruits were tolerated well, but (white) pasta was not. Clearly, each bypass athlete needs to learn through trial and error what foods settle well, and how much can be tolerated at one time.

CONCLUSION

Gastric bypass surgery enhances weight loss, but exercise appears to be a key to long-term weight loss success. Bypass athletes need special attention, to be sure they consume a performance enhancing balance of carbohydrates, protein, fat, calories and fluids, as well as vitamins and minerals. They need to be careful to not overexercise to the extent they get injured. Injuries that result in reduced ability to exercise could easily result in weight regain.

A lack of research limits the sports dietitians' ability to counsel bypass athletes. Given the growing number of people who are having bypass surgery, there is a growing need for information on how to best care for this small subgroup of reduced obese people who choose to become endurance athletes.

Δίαιτα απώλειας βάρους και σωματική δραστηριότητα Αναζητώντας την υγιή ισορροπία

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