

Effect of Weight Loss by Obese Children on Long-Term Growth

Epstein et al report on their assessment of height growth in a group of children who were treated in a complex weight loss program 10 years previously. Subjects were enrolled in the original study at 6 to 12 years of age and were initially 20% to 100% overweight for age, sex, and height. The children and at least one parent participated in the weight loss program, which included weekly treatment meetings for 8 to 12 weeks, monthly meetings for 6 to 12 months, and a *traffic light* diet that limited energy intake to 3,780 to 5,040 joules/day. The traffic light diet characterizes foods into color-designated categories, including green foods (primarily low-energy vegetables), yellow foods (basic dietary staples needed for a balanced diet), and red foods (high-energy, low-nutrient-dense foods). Red foods were restricted to 4 servings/wk. When the children were within 10% of ideal body weight, they were placed on a maintenance program and taught to increase their energy intake by 420 J/d per 1 week term until they were no longer losing weight. Subjects were followed prospectively, with anthropometric data collected at 5 and 10 years posttreatment.

One hundred fifty-eight subjects participated in the follow-up studies. Most subjects (80%) were weighed and measured by the principal investigator (PI), while 2% were measured by other physicians since they had moved from the area; 18% self-reported their height and weight. Self-reports were adjusted using regression equations developed by the PI from self-reported estimates of height and weight and measured heights and weights of 1,000 children. Child and midparental height percentiles were constructed based on the National Center for Health Statistics standards.

Mean age at the initiation of weight loss therapy was 10.4 ± 1.6 years; mean height was 71.6 ± 26.5 height percentile; and mean overweight was $45\% \pm 16.6\%$. Initially, boys were more overweight than girls. Height percentiles showed a significant decrease from baseline to 5 years, and 5 to 10 years. Weight also changed significantly over time, with boys showing greater

increases in weight than girls. Height percentiles for boys at 0, 5, and 10 years were 71.3 ± 25.3 , 64.0 ± 27.2 , and 54.6 ± 25.9 , respectively. Height percentiles for boys were significantly greater than midparental height percentiles at baseline and at 5 years but not at 10 years. Height percentiles for girls averaged 71.8 ± 25.2 , 60.5 ± 29.4 , and 58.1 ± 26.2 at baseline, 5, and 10 years, respectively. Height percentiles were also greater than midparental height at baseline and 5 years but not at 10 years. There were no significant differences or changes in height percentiles for successful versus unsuccessful weight maintainers. *Thus, the authors conclude that their weight loss program does not lead to significant long-term reductions in height.* They point out that the accelerated height of obese children is often associated with early puberty and earlier growth spurts, but the final height in these children is similar to their midparental height.

Epstein LH, et al. *Am J Dis Child* 1993;147:1076-1080.

Editor's comment: *This is a very important study. Epstein and colleagues have designed and studied weight loss programs for children in a meticulous fashion for a number of years. Their data have demonstrated some success at weight loss (30% of the children were not obese 10 years after treatment) and now the absence of deleterious effects on final height has been documented. There is concern that children whose energy intake, especially fat, is severely restricted may experience poor growth and delay of puberty. The studies of markedly obese children subjected to moderate calorie restriction and followed prospectively have not been reported previously. The data presented by Epstein et al are reassuring and suggest that greater effort should be made by pediatricians to help children lose excess weight and reduce their risk for obesity-associated disorders of adulthood.*

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