Reduced rate of energy expenditure as a risk factor for body-weight gain.

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The contribution of reduced energy expenditure to the development of obesity has been a point of controversy. We measured 24-hour energy expenditure (adjusted for body composition, age, and sex), in a respiratory chamber, in 95 southwestern American Indians. Energy expenditure correlated with the rate of change in body weight over a two-year follow-up period (r = -0.39, P less than 0.001). The estimated risk of gaining more than 7.5 kg in body weight was increased fourfold in persons with a low adjusted 24-hour energy expenditure (200 kcal per day below predicted values) as compared with persons with a high 24-hour energy expenditure (200 kcal per day above predicted values; P less than 0.01). In another 126 subjects, the adjusted metabolic rate at rest at the initial visit was also found to predict the gain in body weight over a four-year follow-up period. When the 15 subjects who gained more than 10 kg were compared with the remaining 111 subjects, the initial mean (+/- SD) adjusted metabolic rate at rest was lower in those who gained weight (1694 +/- 103 vs. 1764 +/- 109 kcal per day; P less than 0.02) and increased to 1813 +/- 134 kcal per day (P less than 0.01) after a mean weight gain of 15.7 +/- 5.7 kg. In a group of 94 siblings from 36 families, values for adjusted 24-hour energy expenditure aggregated in families (intraclass correlation = 0.48). We conclude that a low rate of energy expenditure may contribute to the aggregation of obesity in families.

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