

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 (\pm SD) adjusted metabolic rate at rest was lower in those who gained weight (1694 \pm 103 vs. 1764 \pm 109 kcal per day; P less than 0.02) and increased to 1813 \pm 134 kcal per day (P less than 0.01) after a mean weight gain of 15.7 \pm 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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