Efficacy of Diet and Exercise in Reducing Body Weight and Conversion to Overt Diabetes

The study by Wing et al. (1) evaluates the efficacy of diet and exercise, separate or combined, in reducing body weight and conversion to overt diabetes. The conversion to diabetes did not significantly differ among the treatment groups. Study participants whose baseline glucose tolerance tests demonstrated impaired glucose tolerance (IGT) were more likely to develop diabetes. Only 6% of those with normal glucose tolerance developed diabetes, compared with 25% of those with IGT. A weight loss of 4.5 kg reduced the risk of developing diabetes in those with normal glucose tolerance at study entry, as well as those with IGT. The study was conducted using the 1979 criteria for diabetes and IGT (2), but the results were similar when the 1997 criteria for diabetes (3) were used to estimate conversion.

CLINICAL IMPLICATIONS — Self-reported exercise and dietary variables did not predict conversion to diabetes within the treatment arms of the Wing et al. study (1). There was also no significant difference in weight loss by treatment arm. When groups were combined, participants who reported lowering calorie and fat intake, and who performed best on the fitness test, had the greatest weight loss at the 2-year evaluation. Participants who lost weight were less likely to develop diabetes. These findings suggest that changing lifestyle can reduce the risk of developing diabetes, but making long-term lifestyle changes remains a difficult challenge. The Institute of Medicine of the National Academy of Sciences suggests criteria for matching an individual's weight-related needs to weight management program characteristics in order to achieve long-term engagement and weight loss (4).

A major barrier to the long-term benefit of a lifestyle intervention is weight recidivism. Factors traditionally associated with this problem include failure to continue attending weight-loss program sessions and to maintain lifestyle changes as well as potential genetic determinants. Although Wing et al. (1) achieved a retention rate of 84% for the 2-year data collection visit, the proportion attending intervention sessions during the 2nd year varied from 15 to 36% among the treatment groups (1). Achieving long-term success and engaging long-term weight-control participants are formidable challenges.

Another aspect of motivation is readiness to make behavioral changes. When participants enter a weight-loss program, they may demonstrate a global readiness to change behavior. However, making the complex behavioral changes required to achieve and maintain weight loss can be overwhelming (4). Continuing reassessment of behavioral strategies may be needed.

The 1994 American Diabetes Association technical review and position statement on nutrition principles stress the importance of weight control in managing diabetes (6,7). The possibility of preventing diabetes is not addressed. The metabolic syndrome that precedes diabetes includes hypertension and dyslipidemia. The lipid profile and blood pressure improved with the initial weight loss in the Wing et al. (1) study. Interestingly, the 4.5-kg loss associated with a lower risk of developing diabetes in this study is also considered to be the critical level of weight loss to control a modest elevation of blood pressure (8).

PUBLIC HEALTH IMPLICATIONS — Obesity, particularly among the relatives of people who have diabetes, is a major factor for the development of type 2 diabetes. There are no available estimates of how many Americans are overweight and have first-degree relatives with diabetes. Data from the National Health and Nutrition Examination Survey suggest that the prevalence of being overweight is increasing. Currently, 58 million adults in the U.S. are considered overweight (9). The number of overweight Americans who have relatives with diabetes is unknown. It would appear then that controlling body weight needs a public health approach. Vinicor (10) focused on the public health significance of diabetes, indicating the benefit of achieving relatively small changes in large population groups. The Diabetes Prevention Program (DPP) (11), a multicenter trial testing the effectiveness of lifestyle versus medication intervention in the risk of developing diabetes, will further address such public health questions. Hopefully, as data is accumulated from diabetes prevention studies, such as Wing et al. (1) and the DPP (11), diabetes recommendations will also be able to address prevention.

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