Diet and exercise for new-onset type 2 diabetes?

The global burden of diabetes is increasing rapidly. The International Diabetes Federation reports that the disease affects at least 285 million people worldwide, a figure that will increase to 438 million by the year 2030. Each year, roughly 6 million people worldwide develop diabetes; the vast majority (>90%) have type 2 diabetes. The increasing prevalence of obesity—fuelled by excessive calorie intake, suboptimum dietary quality, and sedentary lifestyles—is driving this epidemic. Several large, randomised clinical trials have shown that intensive lifestyle intervention is highly effective in prevention of type 2 diabetes among patients with impaired glucose tolerance, and benefits have been sustained for several years, even after the end of the active intervention. Intensive lifestyle intervention can also lead to sustained weight loss and a significant improvement in glycaemic control and fitness in individuals with pre-existing diabetes.

An appropriate question is whether less-intensive lifestyle intervention is beneficial in managing new-onset type 2 diabetes. In The Lancet, Robert Andrews and colleagues report the Early ACTID (Early ACTivity In Diabetes) trial. It examined the benefits of dietary intervention versus diet plus physical activity for glycaemic control and other metabolic factors among patients with newly diagnosed diabetes. This 52-week, multicentre trial had three groups: usual care (control group, initial dietary consultation and follow-up every 6 months), diet only (dietary consultation every 3 months with monthly nurse support), and diet plus activity (as diet group, plus 30 min brisk walking five times a week); patients were assigned to the groups in a ratio of two:five:five (99 usual care, 248 diet only, and 246 diet plus activity). Because the primary comparison was diet plus activity versus diet only, with only a secondary interest in usual care, an unequal randomisation ratio was justified. At 6 months, glycated haemoglobin A1c (HbA1c) was 0.28% lower in the diet only intervention group than in the usual care group compared with a 0.33% difference between the diet plus activity group and the usual care group, but the difference between the intervention groups was not significant. These benefits were slightly attenuated but remained significant at 12 months. Compared with controls, patients in both the diet and diet and activity groups had significant improvements in the secondary outcomes of weight, waist circumference, and insulin resistance at both 6 months and 12 months, and use of hypoglycaemic medication at 12 months. However, there was no evidence of further benefits from addition of physical activity to dietary intervention.

These findings should be interpreted in the context of the trial, which was undertaken in general practices in the southwest of England, where patients with newly diagnosed type 2 diabetes are routinely provided with a standard health education programme on diabetes management that focuses on dietary advice. Therefore, the investigators set out to test whether more-intensive dietary counselling improved glycaemic control and other outcomes compared with the standard programme, and whether additional activity counselling further improved these outcomes over and above the dietary programme. The results suggest that given the same amount of time, advice on diet only had similar effects over 12 months to combined diet and activity counselling. The researchers argue that, although more intensive dietary advice improved outcomes compared with usual care, there is no justification to add a physical activity component on top of the dietary programme to manage newly diagnosed diabetes.

Why was there no further improvement of outcomes with addition of physical activity to dietary counselling? Participants were advised to achieve more than 30 min of brisk walking on at least 5 days per week; data from...
pedometers showed very good adherence. Previous clinical trials have shown that increased physical activity, including brisk walking, significantly improves glycaemic control among patients with pre-existing diabetes. A combination of aerobic exercise and resistance training, in particular, is more beneficial than aerobic exercise or resistance training alone. The Early ACTID trial did not include a group assigned only physical activity; therefore, the results do not necessarily mean that an increase in physical activity is ineffective for diabetes management. It is possible that modification of two complex behaviours at the same time is no more effective than a change in one—ie, the need for effort in both aspects of life diminishes positive dietary changes by patients in the diet plus activity group. Nonetheless, in subgroup analyses, a combination of diet and exercise worked significantly better than diet only in participants with higher HbA\textsubscript{1c}, insulin resistance, and body-mass index at baseline.

Another question is whether the improvement in outcomes is clinically significant. At 6 months, diet alone improved HbA\textsubscript{1c} by 0·28% versus 0·33% with diet and exercise, from a mean baseline value of 6·7%. The differences are slight but clinically meaningful; a decrease in HbA\textsubscript{1c} of 1% (about 11 mmol/mol) can reduce rates of major cardiovascular disease events by 12% to 16% and microvascular complications by 37%. Moreover, diet and physical activity can exert long-term health benefits beyond improvement of metabolic markers. The reduction in HbA\textsubscript{1c} through diet and exercise in the Early ACTID study was comparable to the effect of sitagliptin phosphate and metformin hydrochloride among patients who had received no previous treatment for type 2 diabetes. In a subset of 381 patients with baseline HbA\textsubscript{1c} of less than 7%, HbA\textsubscript{1c} decreased by 0·20% with sitagliptin and 0·25% with metformin.

Translation of these results into community settings requires concerted efforts by patients, dietitians, and clinicians. In the Early ACTID study, the enhanced dietary programme included 6·5 h of individual counselling throughout the year (2 h with a dietitian and 4·5 h with a nurse). In comparison, the Look AHEAD\textsuperscript{4} participants in the intensive lifestyle intervention group met with dietitians, behavioural counsellors, or exercise specialists every week for the first 6 months, and three times per month for the next 6 months. The long-term effects and cost-effectiveness of these programmes need to be assessed in future studies. There is little doubt that improved nutrition and physical activity are beneficial for individuals with or without diabetes, and research into the most effective way to deliver these benefits (including individual behavioural changes and creation of a supportive food and social environment) deserves high priority.

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