Changes in diet and physical activity prevented type 2 diabetes mellitus in people with impaired glucose tolerance

Tuomilehto J, Lindström J, Eriksson JG, et al, for the Finnish Diabetes Prevention Study Group. ***Prevention of type 2 diabetes mellitus by changes in lifestyle among subjects with impaired glucose tolerance.*** *N Engl J Med 2001 May 3;**344**:1343–50.*

QUESTION: In patients with impaired glucose tolerance, is a lifestyle intervention programme effective for preventing type 2 diabetes mellitus?

Design

Randomised (allocation concealed*), unblinded,* controlled trial with mean follow up of 3.2 years (the Finnish Diabetes Prevention Study).

Setting

5 locations in Finland (Helsinki, Kuopio, Oulu, Tampere, and Turku).

Patients

522 patients between 40 and 65 years of age (mean age 55 y, 67% women) who were overweight (body mass index ⩾ 25 kg/m^2) and had impaired glucose tolerance (mean plasma glucose level between 7.8 and 11.0 mmol/l 2 h after receiving 75 g of oral glucose on 2 occasions, in patients with plasma glucose levels < 7.8 mmol/l after an overnight fast). Exclusion criteria included diabetes mellitus and advanced chronic disease. Follow up was 92%.

Intervention

Patients were allocated to receive individualised counselling aimed at reducing weight by ⩾ 5%, reducing total and saturated fat intake, increasing intake of fibre, and increasing physical activity to at least 30 minutes per day (intervention group, n = 265) or general oral and written information about diet and exercise (control group, n = 257).

Main outcome measures

The primary outcome measure was incidence of newly diagnosed type 2 diabetes (confirmed by 2 oral glucose tolerance tests). A secondary outcome measure was amount of weight loss.

Main results

Analysis was by intention to treat. At 2 years, people in the intervention group had a greater mean weight loss than did those in the control group (3.5 *v* 0.8 kg, p < 0.001). At 4 years, the incidence of diabetes was lower in the intervention group than in the control group (p < 0.001) (table).

Conclusion

An individualised lifestyle intervention programme aimed at improving dietary habits and increasing physical activity was effective for preventing type 2 diabetes mellitus in people with impaired glucose tolerance.

*See glossary.

Lifestyle intervention programme v control for the prevention of type 2 diabetes mellitus in patients with impaired glucose tolerance at a mean follow up of 3.2 years†

Outcome	Lifestyle intervention	Control	RRR (95% CI)	NNT (CI)
Diabetes	10%	23%	56% (33 to 71)	8 (5 to 15)

†Abbreviations defined in glossary; RRR, NNT, and CI calculated from data in article.

COMMENTARY

People who have a family history of type 2 diabetes, gestational diabetes, or signs of metabolic syndrome (ie, abdominal obesity, hypertriglyceridemia, or impaired fasting glucose) are at high risk for developing type 2 diabetes.[1] A 6 year randomised trial done in China[2] suggests that diet and exercise may decrease the risk for diabetes in these patients. In practice, some patients do not start or sustain these non-pharmacological interventions, and clinicians are usually sceptical about the efficacy of lifestyle modification interventions. Consequently, researchers are also evaluating medications (eg, acarbose, metformin, and angiotensin-converting enzyme inhibitors) that may prevent or delay the development of diabetes.

The study by Tuomilehto *et al* offers evidence for the sustained effectiveness of an intensive dietary and exercise intervention in patients with impaired glucose tolerance. This evidence is weakened by the lack of blinding of investigators. Furthermore, the intervention may not be as effective in usual practice because of differences that may exist between the volunteer participants and usual patients, and because of the inability of usual practice systems to provide intensive and individualised dietary and exercise interventions.

Nevertheless, clinicians should not be overly sceptical about their ability to modify a patient's lifestyle. This study suggests that such goals may not need to be ambitious to be effective. Patients who are at high risk for diabetes may benefit from intensive and individualised diet, and at-risk patients should collaborate with their physicians in establishing exercise programmes.

Victor Montori, MD
Mayo Clinic
Rochester, Minnesota, USA

1 Mahon J, Dupre J. Early detection and prevention of diabetes mellitus. In: Gerstein HC, Haynes RB, eds. *Evidence-based Diabetes Care*. Hamilton, Ontario, Canada: BC Decker, 2001.
2 Pan XR, Li GW, Hu YH, *et al*. Effects of diet and exercise in preventing NIDDM in people with impaired glucose tolerance. The Da Qing IGT and Diabetes Study. *Diabetes Care* 1997;**20**:537–44.

Sources of funding: Finnish Academy; Ministry of Education; Novo Nordisk Foundation; Yrjö Jahnsson Foundation; Finnish Diabetes Research Foundation.

For correspondence: Professor J Tuomilehto, National Public Health Institute, Department of Epidemiology and Health Promotion, Diabetes and Genetic Epidemiology Unit, Mannerheimintie 166, FIN-00300 Helsinki, Finland. Fax +35 89 4744 8338.

Evid Based Med: first published as 10.1136/ebm.6.6.176 on 1 November 2001. Downloaded from http://ebm.bmj.com/ on December 6, 2021 by guest. Protected by copyright.