A lifestyle intervention continued to prevent type 2 diabetes in high-risk patients after the program was stopped


Clinical impact ratings: GIM/FP/GP ★★★★★★☆ Endocrinology ★★★★★☆

QUESTION
In overweight patients with impaired glucose tolerance, are the benefits of a lifestyle intervention for preventing type 2 diabetes maintained after the program is stopped?

METHODS
Design: Randomized controlled trial.
Allocation: Unclear allocation concealment.*
Blinding: Blinded [study nurse and laboratory staff].†
Follow-up period: Median 7 years (median 3 y postintervention).
Setting: 5 centers in Finland.
Patients: 522 patients [40 to 65 years of age]† (mean 55 y, 67% women) with [body mass index ≥ 25 kg/m²]† and impaired glucose tolerance [(plasma glucose level 140 to 200 mg/dL [7.8 to 11.0 mmol/L] 2 h after a 75-g oral glucose tolerance test and fasting plasma glucose level < 140 mg/dL [7.8 mmol/L])]† on 2 occasions. Exclusion criteria included [previous diagnosis of diabetes and life expectancy < 6 y]†.
Intervention: Lifestyle intervention, involving a median 20 individual dietary counseling sessions with a nutritionist and advice to increase physical activity, including the opportunity to participate in individualized training sessions, continued for a median 4 years (n = 265), or general oral and written information about diet and exercise (control) (n = 257).

OUTCOMES: Type 2 diabetes (fasting plasma glucose level ≥ 140 mg/dL [7.8 mmol/L] or plasma glucose level > 200 mg/dL [11.0 mmol/L] 2 h after a glucose challenge) and proportion of patients who achieved ≥ 4 of the 5 goals of the intervention (weight loss ≥ 5%, < 30% of energy intake from fat, < 10% of energy intake from saturated fat, fiber intake ≥ 15 g/1000 kcal, and moderate physical activity ≥ 30 min/d).
Patient follow-up: 91% (intention-to-treat analysis).

MAIN RESULTS
The incidence of type 2 diabetes was lower in the intervention group than in the control group over both the entire follow-up period and the postintervention period (Table). During the intervention period, the intervention group achieved lower mean body weight and intake of total and saturated fat and higher mean intake of dietary fiber and physical activity levels than the control group. These benefits were maintained in the intervention group (in patients who had not developed diabetes) after stopping the intervention. 18% of the intervention group and 7% of the control group achieved ≥ 4 of the 5 lifestyle goals at 1 year postintervention (P = 0.004).

CONCLUSION
In overweight, middle-aged patients with impaired glucose tolerance, a lifestyle intervention continued to prevent type 2 diabetes for at least 3 years after the program was stopped.

Sources of funding: Academy of Finland; Julio Vainio Foundation; Ministry of Education; Novo Nordisk Foundation; Yrjö Jahnsson Foundation; Finnish Diabetes Research Foundation.
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*Lifestyle intervention vs oral and written information (control) to prevent type 2 diabetes in overweight, middle-aged patients with impaired glucose tolerance†

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Follow-up</th>
<th>Incidence per person-y</th>
<th>RRR (95% CI)</th>
<th>NNT (CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetes</td>
<td>7 y</td>
<td>4.3%</td>
<td>7.4%</td>
<td>4% (23 to 56)</td>
</tr>
<tr>
<td></td>
<td>Last 3 y†</td>
<td>4.6%</td>
<td>7.2%</td>
<td>38% (2 to 61)</td>
</tr>
</tbody>
</table>

†Abbreviations defined in Glossary; RRR, NNT, and CI calculated from hazard ratios in article.
§Postintervention period.

COMMENTARY
50% of persons with impaired glucose tolerance will develop type 2 diabetes mellitus over the next 10 years. There is considerable interest among health care providers and policy makers worldwide in avoiding the diagnosis and its long-term adverse effects on morbidity and mortality (1, 2).

The study by Lindström and colleagues, an unplanned extended evaluation of a lifestyle intervention in 522 Finnish patients with impaired glucose tolerance, was done because the 3-year analysis of the Finnish Diabetes Prevention Study showed a 58% relative risk reduction for diabetes (3), which would be clinically useful if sustained. By comparing a group having a median of 20 counseling sessions over 4 years with a control group, the study provided evidence that an intensive lifestyle intervention can reduce risk for type 2 diabetes in high-risk persons.

It was underpowered because the development of diabetes was a censoring event and patients with diabetes were no longer followed. Patients in the control group were informed of their at-risk status and had an intervention (advice and leaflets) as well as follow-up, so the real effect of the Finnish program may be even more marked for at-risk persons who have not been identified or given advice.

Questions about whether avoiding or delaying the development of diabetes will produce overall benefits in terms of important morbidities or mortality remain open.

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References