In people with impaired glucose tolerance, do lifestyle or pharmacological interventions prevent or delay type 2 diabetes?

**METHODS**

**Data sources:** Medline (1966 to July 2006), EMBASE/Excerpta Medica (1980 to July 2006), Cochrane Central Register of Controlled Trials, Cochrane Database of Systematic Reviews (Issue 2, 2006), references of relevant articles, and experts.

**Study selection and assessment:** randomised controlled trials (RCTs) in any language that evaluated an intervention to delay or prevent type 2 diabetes in people with impaired glucose tolerance and assessed development of diabetes as an outcome. 21 RCTs met the selection criteria, and 17 RCTs (n = 8084, mean age range 39–57 y, mean body mass index range 24–36 kg/m², average follow up range 0.4–4.6 y) were included in the meta-analysis. Among the 17 RCTs, 8 had quality scores >3 out of 5 on the Jadad scale, and 2 had allocation concealment.

**Outcomes:** development of type 2 diabetes and adverse events.

**MAIN RESULTS**

Meta-analysis using a random effects model showed that both lifestyle interventions (diet, exercise, or both) and pharmacological interventions (oral diabetes drugs [acarbose, flumamine, glipizide, metformin, or phenformin] or an anti-obesity drug [orlistat]) reduced the incidence of type 2 diabetes (table). 2 trials assessing troglitazone were excluded from the meta-analysis because the drug had been removed from several markets worldwide because of liver toxicity. In 1 trial, jiangtang bushen (a Chinese herbal) did not reduce diabetes (table). Adverse events related to pharmacological interventions (gastrointestinal and hypoglycaemic symptoms) were more common in the treatment groups (no statistical tests reported).

**CONCLUSION**

In people with impaired glucose tolerance, lifestyle or pharmacological interventions prevent or delay type 2 diabetes.

Lifestyle or pharmacological interventions v placebo to prevent or delay type 2 diabetes in people with impaired glucose tolerance*

<table>
<thead>
<tr>
<th>Outcome at mean 0.4–4.6 y</th>
<th>Comparisons</th>
<th>Number of trials (n)</th>
<th>Hazard ratio (95% CI)</th>
<th>NNT (credible interval)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 2 diabetes</td>
<td>Lifestyle v placebo†</td>
<td>10 (4452)</td>
<td>0.51 (0.44 to 0.60)</td>
<td>7 (5 to 9)</td>
</tr>
<tr>
<td></td>
<td>Oral diabetes drug v placebo‡</td>
<td>8 (4580)</td>
<td>0.70 (0.62 to 0.79)</td>
<td>11 (9 to 15)</td>
</tr>
<tr>
<td></td>
<td>Orlistat v placebo</td>
<td>2 (814)</td>
<td>0.44 (0.28 to 0.69)</td>
<td>6 (5 to 8)</td>
</tr>
<tr>
<td></td>
<td>Jiangtang bushen v placebo</td>
<td>1 (51)</td>
<td>0.32 (0.03 to 3.07)</td>
<td>Not significant</td>
</tr>
</tbody>
</table>

*Abbreviations defined in glossary.
†Lifestyle interventions included diet, exercise, or both.
‡Oral diabetes drugs were acarbose, flumamine, glipizide, metformin, or phenformin.

A modified version of this abstract appears in ACP Journal Club.
Review: lifestyle or pharmacological interventions prevent or delay type 2 diabetes in people with impaired glucose tolerance

_Evid Based Nurs_ 2007 10: 78
doi: 10.1136/ebn.10.3.78

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