Lifestyle Changes Effective in Preventing Type 2 Diabetes

LEICESTER, England, Jan. 19 -- Lifestyle changes appear to be at least as effective as drugs in preventing type 2 diabetes among patients with impaired glucose tolerance, according to a meta-analysis.

Both lifestyle changes and pharmacotherapy cut diabetes risk in half when maintained long term, said Clare L Gillies, M.Sc., of the University of Leicester, and colleagues, in a study published online in the *BMJ*.

The researchers said that lifestyle interventions may be preferable for reducing diabetes risk for these high-risk patients though compliance issues for lifestyle interventions and adverse effects for pharmacologic interventions need to be better understood.

"Determining the best approach to intervention, be it pharmacological or lifestyle, depends not just on their performance in trial settings but on issues not yet resolved," they wrote. "Also should what is fundamentally a lifestyle issue really be treated with a lifelong course of medication?"

The meta-analysis of 17 randomized, controlled studies included more than 8,000 participants with impaired glucose tolerance.

The researchers included all relevant papers from Medline, Embase, and the Cochrane library from 1979 through July 2006 on interventions including diet, exercise or the combination, oral diabetes drugs, the anti-obesity drug Xenical (orlistat), and the Chinese herbal remedy jiangtang bushen recipe. Rezulin (troglitazone) was excluded because liver toxicity caused it to be withdrawn.

They found "overwhelming evidence" of benefit for interventions to prevent or delay type 2 diabetes. The efficacy findings for lifestyle interventions were:

Overall reduced relative risk of developing diabetes by 49% compared with standard advice (hazard ratio 0.51, 95% confidence interval 0.44 to 0.60, $P<0.001$),

Diet alone had a hazard ratio of 0.67 (95% CI 0.49 to 0.92, $P=0.013$),

Exercise alone had a hazard ratio of 0.49 (95% CI 0.32 to 0.74, $P=0.001$), and

The combination of diet and exercise had a hazard ratio of 0.49 (95% CI 0.40 to 0.59, $P<0.001$).

For pharmacologic interventions, the results were:

Xenical reduced relative risk by 56% (HR 0.44, 95% CI 0.28 to 0.69, $P<0.001$), and

Oral diabetes drugs reduced the relative risk of developing diabetes by 30% compared to control (HR 0.70, 95% CI 0.62 to 0.79, $P<0.001$).

In the only trial looking at an herbal intervention, jiangtang bushen recipe tended to reduce risk compared with standard diabetes advice though the difference was not significant (HR 0.32, 95% CI 0.03

to 3.07, *P*=0.323).

Among the trials overall, the five-year cumulative incidence of diabetes was 37.1%, similar to that found with other studies. Baseline risk of type 2 diabetes was not consistent between trials and ranged from 2.6 to 30.0 cases per 100 person-years.

The absolute reduction in the occurrence rate of diabetes by intervention was:

15.8% for lifestyle intervention (95% CI 19.8% to 11.9%),

9.3% for oral diabetes drugs (95% CI 12.4% to 6.7%),

18.4% for Xenical (95% CI 24.6% to 13.1%), and

22.7% for the jiangtang bushen (37.9% to −11.7%).

The numbers needed to treat for benefit were:

6.4 for lifestyle intervention (95% CI 5.0 to 8.4),

10.8 for oral diabetes drugs (95% CI 8.1 to 15.0),

5.4 for Xenical (95% CI 4.1 to 7.6), and

4.0 for jiangtang bushen (NNT for harm 16.9 to NNT for benefit 24.8).

Lifestyle interventions were more effective among those with higher baseline body mass index (BMI). For each one unit increase in BMI at baseline, the hazard ratio for developing diabetes with lifestyle interventions fell 7.3% (95% CI 13.6% to 0.9%), *P*=0.029). However, the researchers cautioned that this finding was based on study level rather than patient level data, which may lead to aggregation bias.

The investigators also found a widely varying adverse event profile among the trials. However, all were more common in intervention than placebo groups and tended to be gastrointestinal events in the drug trials. Long-term impact appeared to be poor after withdrawal of the interventions.

Even minor adverse events, they noted, "take on greater importance if interventions have to be taken for life."

"Generally we can assume that lifestyle interventions incur fewer and less serious side effects than drug treatment, but, as with the pharmacological interventions, their effect may not be permanent and advice on diet and exercise may need to be reinforced on a regular basis," they added.

Because the studies included in the meta-analysis had to have enrolled patients already identified as having impaired glucose tolerance, the findings may not be applicable to individuals without impaired glucose tolerance or who have already progressed to diabetes.

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