Does a low-GI diet improve glycaemic control in people with diabetes?

A recent Cochrane review gathered evidence on whether a low-glycaemic diet can improve diabetes control and whether it reduces hypoglycaemic events.

BACKGROUND
The management of diabetes aims to normalise blood-glucose levels, since improved blood-glucose control is linked to a reduction in the development and progression of complications.

While dietary factors affect blood-glucose levels, there is no universal approach to the optimal dietary strategy for diabetes. There is controversy concerning how useful the glycaemic index (GI) or glycaemic load (GL) actually is in meal planning for people with diabetes.

The authors of this Cochrane review point out that improved glycaemic control through diet could lessen the risk of diabetic complications, improve patients’ quality of life, increase life expectancy and minimise – or even avoid – the need for expensive medication and diabetic health care.

WHAT EVIDENCE DID THE REVIEW FIND?
This Cochrane review assessed the effects of low-GI or low-GL diets on glycaemic control in people with diabetes. The authors carried out electronic searches of the Cochrane library (Issue 2, 2008), Medline, Embase and Cinahl up to June 2008 with no language restriction.

They assessed randomised controlled trials of four weeks or longer that compared a low-GI or low-GL diet with a higher GI/GL or other diet for people with either type 1 or type 2 diabetes mellitus, whose condition was not optimally controlled. The reviewers identified 11 studies that met the inclusion criteria, involving a total of 402 participants.

Ten studies compared a low-GI diet with a higher-GI diet, and one study compared the low-GI diet with a diet using measured carbohydrate exchanges. Primary outcome measures were glycaemic control and adverse events. Secondary outcome measures included insulin action.

Glycaemic control
The review found that pooled data from the six studies reporting HbA1c in participants where this was suboptimal showed there was a significant decrease in these levels in people following low-GI diets. The decrease of 0.5% (weighted mean difference) in HbA1c levels indicated improved glycaemic control.

In the study comparing the low-GI diet with the carbohydrate-exchange diet, by 12 months the mean difference in HbA1c levels between the groups was not significant. However, twice as many participants in the low-GI group (45%) achieved acceptable levels compared with only 22% in the carbohydrate-exchange group.

In four studies, percentage HbA1c was also significantly lower after the low-GI diet compared with after the high-GI diet.

Adverse effects
The review found two trials that reported on hypo- or hyperglycaemic events but did not give further information on whether these were mild, moderate or severe.

In one study, where the control diet was a higher-GI diet, episodes of hypoglycaemia were significantly fewer with the low-GI diet compared with the control diet.

In the second study, in which the control diet was a measured carbohydrate-exchange diet in children with type 1 diabetes, the proportion of participants reporting more than 15 episodes of hyperglycaemia per month was significantly lower for the low-GI diet group compared with the control group.

Insulin action
Five studies reported on parameters related to insulin action. One study found that whole-body peripheral insulin sensitivity, measured by euglycaemic-hyperinsulinaemic clamp, was significantly higher after the low-GI diet than after the high-GI diet.

REFERENCE

Another study found no significant differences in insulin or drug needs, or in insulin binding to erythrocytes.

WHAT DID THE REVIEW CONCLUDE?
The authors say this review indicates that glycaemic control in people with diabetes improved significantly with a low-GI diet, compared with those on higher-GI diets or measured carbohydrate exchange diets.

They add the decrease of 0.5% in HbA1c is clinically significant and is similar to falls achieved through medications for newly diagnosed type 2 diabetes. Improvements of this size have been linked to significantly reduced risk of microvascular complications.

The authors say that improved glycaemic control was also linked to a decrease in adverse outcomes.

They point out that, as participants included both adults and children, the results would be relevant to a range of age groups in similar communities. The inclusion criteria for studies were either type 1 or type 2 diabetes, or both, so the results are relevant to both types.

The authors conclude this review provides data that low-GI diets can significantly improve diabetic control in people with suboptimal control by lowering HbA1c levels by 0.5%. In addition, reduction in glycated haemoglobin with the low-GI diet was linked to a reduced risk of hypoglycaemic episodes.

The improvement seen in insulin sensitivity may benefit patients by reducing or even avoiding the need for medication. The review says that lowering the GI of foods appears to be an effective method of improving glycaemic control without compromising the number of hypoglycaemic episodes.