

## Meta-analysis of high and low glycaemic index diets in diabetes

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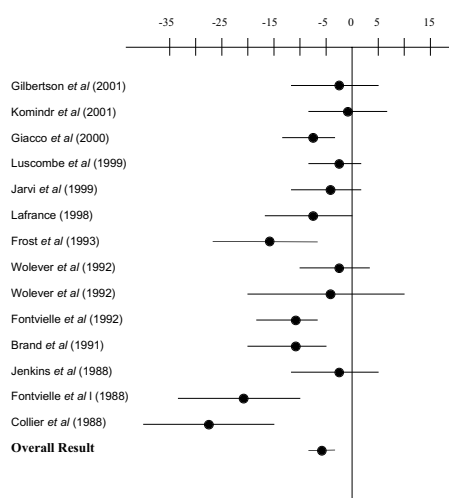
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The most recent position statement on nutrition from the American Diabetes Association (1) concluded that while low glycaemic index (GI) diets may reduce postprandial glycemia, there was no convincing evidence that they improved HbA<sub>1c</sub> or fructosamine. This conclusion contrasts with that of the European Association for the Study of Diabetes that recommends the substitution of low GI foods for high GI foods to help improve glycaemic control. (2). To provide a more objective basis on which to base future recommendations, a meta-analysis of studies was performed to compare the effect of high and low GI diets on glycated hemoglobin (HbA<sub>1c</sub>) and fructosamine levels.

Relevant studies were identified by Medline and World Wide Web searches using the key words *glyc(a)emic index* and *diabetes*. The studies met the following inclusion criteria: published between 1981 and 2001 in English, were randomised crossover or parallel experimental design of at least 2 weeks duration, included diabetic patients (Type 1 and/or Type 2) as subjects, included HbA<sub>1c</sub> or fructosamine as outcome measures and modified at least two meals a day (or >50% total carbohydrate) to constitute a high or low GI diet. The steps used to execute the meta-analysis were drawn from Petitti (3). The primary outcome was the mean % difference in HbA<sub>1c</sub> or fructosamine between the two diets.

Results. Literature searches identified fourteen studies, comprising 356 subjects, that met the inclusion criteria. In the 8 studies in which HbA<sub>1c</sub> was assessed, the mean difference between the low and high GI diet was  $-0.43$  HbA<sub>1c</sub> % points, CI ( $-0.72, -0.13$ ) in favour of the low GI diet. Taking both HbA<sub>1c</sub> and fructosamine data together and adjusting for baseline differences, glycated proteins were significantly reduced on the low GI diet compared with the high GI diet (mean  $-7.4\%$  (CI  $-8.8$  to  $-6.0\%$ ), as shown in the figure. This result was stable and changed little if the data were unadjusted for baseline levels or excluded studies of less than 6 weeks duration. Systematically taking out each study from the meta-analysis did not change the confidence intervals. Hence no one study made a major impact on the mean difference.

We conclude that targeting postprandial hyperglycemia via choice of low GI carbohydrate in place of high GI foods, has consistent, clinically important effects on long term glycaemic control. A 7% fall in HbA<sub>1c</sub> or fructosamine can be compared with the effects of oral hypoglycemic agents (average fall 10%) and insulin analogues (1–2% reduction). Low GI diets may be the only therapy that improves blood glucose levels without a concomitant increase in the risk of hypoglycaemia.



### References

1. ADA. Evidence-based nutrition principles and recommendations for the treatment and prevention of diabetes and related complications. *Diabetes Care* 2002; 25: S50–S60.
2. The Diabetes and Nutrition Study Group of the European Association for the Study of Diabetes. *Euro J Clin Nutr* 2000; 54: 353–5.
3. Petitti, *Metanalysis, decision analysis and cost-effectiveness*, 2001.