Management of type 1 diabetes

What does the future hold for NPH insulin?

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Prior to its launch, the theoretical concept of insulin glargine was very attractive. We were offered the possibility of an insulin with a peakless metabolic action, which should mirror the normal fasting state and reduce the chances of hypoglycaemia, particularly of nocturnal hypoglycaemia. Substituting NPH insulin with glargine did result in a reduction in the frequency of hypoglycaemic episodes and significant improvements in glycaemic control as measured by HbA_{1c} in some, but not all people.

Until now there has been no clinical trial data to support this observation. There is often a problem in translating the findings of clinical trials into clinical practice. The initial papers showed a reduction in the rate of hypoglycaemic episodes and fasting glucose, but no differences in overall glycated haemoglobin concentrations. This is partly because all patients in clinical trial settings receive a great deal of clinical input and this includes the control group. The control groups tend to end up better controlled than we would normally achieve in everyday care and as such it is often difficult to demonstrate significant reductions in HbA_{1c}.

The use of insulin glargine in the clinic setting has strongly suggested that we are seeing clinically significant falls in HbA_{1c}. This paper by a group in Perugia, Italy, supports this, showing a statistically significant improvement in the group treated with insulin glargine as the basal insulin in comparison with a matched group treated with NPH insulin.

This study is useful in supporting what we have suspected for some time, but is perhaps a little late in coming. The current question in clinical practice must surely be – is there now any place for NPH insulin? We also need to know why glargine works well for some people but not so well for others and whether the new long-acting analogue insulin detemir will be any better. We need trial data to establish the appropriate place for these two quite different preparations.

DIABETIC MEDICINE

Glargine more suitable than NPH for type 1 diabetes

Readability	✓✓✓
Applicability to practice	✓✓✓✓✓
WOW! factor	✓✓✓✓

1 The objective of this study was to test the superiority of glargine against NPH insulin on long-term blood glucose and responses to hypoglycaemia.

2 Participants comprised a total of 121 people with type 1 diabetes on intensive therapy of four-times daily NPH and lispro insulin at every meal.

3 Participants were randomised to continuation of NPH four-times daily (n=60) or once-daily glargine at dinner time (n=61) for one year, and lispro insulin at meal-time was continued in both groups.

4 Responses to stepped hyperinsulinaemic hypoglycaemia were measured before and after treatment of one year in 11 participants from each group.

5 Mean daily blood glucose levels were lower with glargine than with NPH insulin.

6 HbA_{1c} at four months decreased with glargine, but did not change with NPH insulin, and frequency of mild hypoglycaemia was lower with glargine than NPH insulin.

7 After one year, glargine plasma glucose, thresholds and maximal responses of plasma adrenaline and symptoms of hypoglycaemia improved, but NPH treatment resulted in no change of responses to hypoglycaemia.

8 The researchers conclude that glargine seems to be more suitable than NPH as basal insulin for the intensive treatment of type 1 diabetes.

Porcellati F, Rossetti P, Pampanelli S et al (2004) Better long-term glycaemic control with the basal insulin glargine as compared with NPH in patients with type 1 diabetes mellitus given meal-time lispro insulin. Diabetic Medicine **21**: 1213–20

BRITISH JOURNAL OF NUTRITION

Meta-analysis supports the use of the GI tool

Readability	✓
Applicability to practice	✓✓✓
WOW! factor	✓

1 The aim of this meta-analysis was to analyse the scientific evidence that low-glycaemic index (GI) diets have beneficial effects on carbohydrate and lipid metabolism compared with high GI diets.

2 Randomised controlled trials with a crossover or parallel design published between 1981 and 2003 that investigated the effect of low-GI vs high-GI diets on markers for carbohydrate and lipid metabolism were searched for.

3 The random effects model was used to examine unstandardised differences in mean values.

4 The main outcomes were fructosamine, HbA_{1c}, HDL-cholesterol, LDL-cholesterol, total cholesterol and triacylglycerol levels.

5 Sixteen studies that met the strict inclusion criteria were identified in the literature searches.

6 Compared with high-GI diets, low-GI diets significantly reduced fructosamine, HbA_{1c} and total cholesterol, and tended to reduce LDL-cholesterol in type 2 diabetes.

7 No changes were observed in HDL-cholesterol and triacylglycerol concentrations, and no substantial heterogeneity was detected which suggests that the effects of low-GI diets in the studies were uniform.

8 The meta-analysis thus supports the use of the GI as a scientifically-based tool that enables selection of food containing carbohydrate to reduce total cholesterol and improve the metabolic control of people with diabetes.

Opperman AM, Venter CS, Oosthuizen W, Thompson RL, Vorster HH (2004) Meta-analysis of the health effects of using the glycaemic index in meal-planning. British Journal of Nutrition **92**: 367–81