Insulin glargine: potential benefits over insulin suspension isophane

The flatter metabolic profile of insulin glargine*, compared with that of insulin suspension isophane [NPH insulin], '*could prove to be advantageous in accommodating the basal insulin requirements of patients with diabetes*', says Dr John Buse from the University of North Carolina, Durham, US.[1]

Dr Buse's comments are made in relation to a euglycaemic glucose clamp study of the pharmacodynamic profile of insulin glargine, compared with insulin suspension isophane, in healthy volunteers.[2] In the study, 15 volunteers received single SC doses of insulin glargine [HOE 901] 0.4 U/kg, insulin suspension isophane 0.4 U/kg and placebo, in a crossover fashion.** Study days were separated by washout periods of ≥ 7 days. The glucose infusion rates required to keep blood glucose levels at 5 mmol/L were measured for 30 hours after study drug administration; volunteers also received a continuous infusion of IV insulin 0.15 mU/kg/min.

Constant metabolic activity

Metabolic activity increased after administration of insulin glargine, reaching a plateau within 4 hours and remaining fairly constant for the rest of the 30-hour period. With insulin suspension isophane administration, a pronounced peak was seen after 4–6 hours. After reaching the peak, there was a constant decline in metabolic activity, although it did not return to baseline levels within the 30-hour period.

After insulin glargine, compared with insulin suspension isophane, administration, the time to maximum metabolic activity was significantly longer (8.6 *vs* 5.4 hours) and the metabolic activity over 30 hours ($AUC_{0–30h}$ of glucose infusion rates) was significantly lower (7.92 *vs* 9.24 g/kg).

The researchers say that the metabolic profile and duration of action suggest that insulin glargine is '*a promising candidate*' for use as a once-daily basal insulin substitute.

'*Potential significance*'

In another study involving 534 patients with type 1 diabetes mellitus who were randomised to continue receiving their existing insulin suspension isophane regimen or to change to insulin glargine, patients who received insulin glargine, compared with those receiving insulin suspension isophane, experienced significantly less hypoglycaemia and had significantly lower fasting plasma glucose levels.[3†;‡] Reductions in glycosylated haemoglobin levels were similar in the 2 groups.

Dr Buse notes that this finding '*does not lessen glargine's potential significance*', as '*reducing hypoglycaemia is a worthy end in itself*'.[1]

Dr Buse says that it will take time for clinicians to learn '*how to actually exploit the theoretical advantages of insulin glargine*'. He suggests that '*the passage of time and the accumulation of clinical experience will enable us to take full advantage of the pharmacodynamics of this product*'.

* Aventis Pharma; registered

** The study was supported by Aventis, Inc.

† The study was supported by Hoechst Marion Roussel.

‡ See Inpharma 1217: 9–10, 11 Dec 1999; see Inpharma 1217 p9-10; 800763236

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