## New protocols for the management of hyperglycemia in hospitalized patients

In spite of the fact that about one-quarter of hospitalized individuals suffer from hyperglycemia, which is associated with numerous adverse effects, there are no standardized treatment strategies for glycemic control in hospitalized patients. DeSantis and colleagues report the results achieved by two protocols—based on either intravenous or subcutaneous insulin—developed for patients at a tertiary-care hospital in Chicago. Educational sessions and step-by-step instructions (including conversion tables) for nurses were essential elements of both protocols that were closely monitored by a 'glucose-management team'.

The intravenous-insulin protocol aimed to achieve target blood glucose levels of between 80 and 110 mg/dl, and was used in 276 critically ill patients. The insulin drip rate was adjusted according to the capillary blood glucose level, which was recorded at least every 2 h. In patients treated with intravenous insulin, the mean capillary blood glucose level was 135.3 mg/ml. Hypoglycemia was recorded in 1.5% of 4,058 blood glucose measurements, and hyperglycemia in 0.06%.

The subcutaneous-insulin protocol was followed in 922 patients whose illness had been stabilized. This protocol used a long-acting insulin analog (glargine) and a rapid-acting insulin analog (aspart). Doses were titrated according to blood-glucose levels, which were measured at least four times a day. In patients treated with subcutaneous insulin, the mean capillary blood glucose concentration was 145.6 mg/ml. Of 18,067 blood glucose measurements, 58.6% were in the target range for this protocol (80–150 mg/dl) and 74.3% were in the clinically acceptable range (80–180 mg/dl). Hypoglycemia and hyperglycemia were recorded in 1.3% and 0.4% of these measurements, respectively.

The authors conclude that both of these protocols provide safe, efficient and cost-effective glycemic control for hospitalized patients, while reducing their risk of hypoglycemia.

**Original article** DeSantis AJ *et al.* (2006) Inpatient management of hyperglycemia: the Northwestern experience. *Endocr Pract* **12:** 491–505

## Dose escalation of pramlintide improves its tolerability and efficacy

Amylin, a pancreatic hormone cosecreted with insulin, is involved in the regulation of postprandial blood glucose levels. The amylin analog pramlintide is used as a supplement to insulin treatment in patients with type 1 diabetes, because it improves control of hyperglycemia; in the initial trials, however, pramlintide also increased nausea and the risk of severe hypoglycemia. In a double-blind, randomized trial, Edelman and colleagues assessed whether the effect of pramlintide could be optimized by administering gradually increasing doses of pramlintide while simultaneously reducing doses of mealtime insulin, which was not done in previous studies.

In total, 296 adult patients who had used intensive insulin therapy for at least 1 year were randomly allocated to receive either pramlintide or placebo while continuing their insulin regime. Pramlintide treatment was started at a dose of 15 μg per meal, followed by a gradual increase (by 15 μg per meal per week, over 4 weeks) to 60 μg per meal, which was used throughout the 25-week maintenance period. Meanwhile, the insulin dose was adjusted according to blood glucose levels, which were monitored by the patients. Pramlintide substantially reduced postprandial elevations of glucose levels during the 29-week trial compared with placebo. Mean body weight and mealtime insulin doses were also markedly reduced in the pramlintide group compared with the placebo group. In both groups, patients experienced only mild or moderate nausea and nonsevere hyperglycemia.

The authors conclude that gradual dose escalation of pramlintide increases its tolerability, while the concomitant reduction of insulin dose increases the safety of the protocol compared to that used in previous trials, and results in favorable glycemic and body weight changes.

**Original article** Edelman S *et al.* (2006) A double-blind, placebo-controlled trial assessing pramlintide treatment in the setting of intensive insulin therapy in type 1 diabetes. *Diabetes Care* **29:** 2189–2195