Insulin Therapy for Intensive Glycemic Control in Hospital Patients

Michelle F. Magee, MD

This month's quiz is based on the article "Insulin Therapy for Intensive Glycemic Control in Hospital Patients," which begins on page 17 of this issue. Choose the single best answer for each question.

CASE

A 66-year-old man with long-standing type 1 diabetes is admitted to the hospital with nausea and fever of unknown origin. His home insulin regimen is neutral protamine Hagedorn (NPH) insulin 32 U in the morning and 10 U at bedtime. He is also taking 10 U of regular insulin with each meal. On this regimen, his last glycosylated hemoglobin was approximately 7%.

1. **Insulin drips are not available outside the intensive care unit in this hospital. What is the most appropriate programmed/scheduled subcutaneous insulin regimen for this patient?**
   (A) Regular insulin 10 U every 6 hours
   (B) Insulin aspart 15 U every 6 hours
   (C) NPH insulin 10 U twice daily with 4 U of insulin aspart every 6 hours
   (D) Glargine insulin 20 U once daily with 4 U of insulin aspart every 4 hours
   (E) Glargine insulin 40 U once daily

CASE CONTINUED

The patient is made NPO and started on sliding-scale rapid-acting insulin as follows: blood glucose of 150–200 mg/dL, give 2 U; 201–250 mg/dL, give 4 U; 251–300 mg/dL, give 6 U; 301–350 mg/dL, give 8 U; 351–400, give 10 U and call the physician. For the first 2 days of the hospital stay, the patient's fingerstick blood glucose (FSBG) level ranges from 165 mg/dL into the 300s. At 11 PM on hospital day 2, his FSBG is 139 mg/dL. The nurse reads the sliding-scale insulin orders and does not give a dose of insulin because the scale instructs her to give insulin only if the blood glucose is 150 mg/dL or higher. At 7 AM, the patient is found unresponsive in complete cardiorespiratory arrest. Laboratory evaluation of blood drawn at the code reveals that his glucose level was 499 mg/dL and that the pH was 6.8.

For answers, see page 56.

2. **What is the most likely cause of cardiorespiratory arrest in this patient?**
   (A) Diabetic ketoacidosis
   (B) Hypoglycemia
   (C) Hypovolemia due to uncontrolled diabetes
   (D) Hyperglycemia
   (E) Hyperglycemic hyperosmolar state

3. **Up to what percentage of patients admitted to the hospital have been shown to have hyperglycemia that is either not recognized or not documented as diabetes by the physician in the medical record?**
   (A) 4% (C) 20% (E) 37.5%
   (B) 12.6% (D) 25%

4. **Which of the following is included in a physiologic insulin regimen for a patient being treated with subcutaneous insulin in the hospital?**
   (A) Intermediate-acting NPH insulin administered once daily at bedtime with rapid-acting insulin analog during the day
   (B) Basal insulin glargine administered once daily in the morning with correction-dose insulin prior to each meal
   (C) Basal insulin glargine administered once daily with a rapid-acting insulin analog with each meal and correction-dose insulin for hyperglycemia
   (D) Basal insulin glargine calculated as 30% of the estimated total daily insulin requirement plus regular insulin with meals and correction-dose insulin for hyperglycemia

5. **According to guidelines for intensive blood glucose control in the hospital, what is the recommended blood glucose target in the non–critical care setting?**
   (A) < 110 mg/dL at all times
   (B) ≤ 100 mg/dL fasting
   (C) 80–140 mg/dL
   (D) 110–180 mg/dL
   (E) < 200 mg/dL at all times

Dr. Magee is director, MedStar Diabetes Institute, Washington Hospital Center, Washington, DC.

Answers to the Clinical Review Quiz on page 28. The article on insulin therapy for glycemic control in hospital patients begins on page 17.

1. (E) Glargine insulin 40 U once daily
2. (A) Diabetic ketoacidosis
3. (E) 37.5%
4. (C) Basal insulin glargine administered once daily with a rapid-acting insulin analog with each meal and correction-dose insulin for hyperglycemia
5. (D) 110–180 mg/dL