

Case Study Responses

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Note: Readers are encouraged to visit www.InsulinJournal.com to review the details of a Case Study published in the January 2006 issue of *Insulin*.

This is an interesting case of an Hispanic woman who develops diabetes with an insulin requirement at a young age in the context of a history of gestational diabetes mellitus (GDM).

The first question this case raises is which type of diabetes this patient has. She has some features suggestive of type 2 diabetes mellitus (DM), including her ethnicity, her body habitus, and her substantial insulin requirements, totaling 150 units daily. However, her young age at onset and poor response to oral agents raise the question of type 1 DM. Although she has symptomatic hyperglycemia after 2 weeks of insulin omission, she is otherwise well and can be assumed to have preserved insulin production. Therefore, it is most likely that this patient has type 2 DM. (Note: This response addresses Question 4 posed at the end of the Case Study.)

GDM is defined as carbohydrate intolerance of variable severity with onset or first recognition during pregnancy. Pregnancy, especially during the later trimesters, is associated with a rise in hormones, including cortisol, progesterone, and human placental lactogen, that increases insulin resistance. Patients with greater underlying insulin resistance or those with compromised β -cell reserves are predisposed to hyperglycemia in the later trimesters. Typically, this hyperglycemia resolves postpartum; nonetheless, GDM is recognized as a risk factor for the subsequent development of type 2 DM. Current estimates of the incidence of type 2 DM post-GDM are variable but are generally about 40%. Type 2 DM post-GDM typically appears within the first 5 to 10 years after the diagnosis of GDM.

Question 1. What is the most appropriate therapy for this patient?

Answer: d. Obtain a basic chemistry panel that includes electrolytes and blood gases, administer a regular or short-acting insulin, and initiate treatment with long-acting insulin using a dose appropriate for an insulin-naïve patient.

Because this patient is well, appearing with no physical evidence of dehydration, she does not require hospital admission. Instead, the most appropriate intervention is to reinstate insulin. In addition, it is reasonable to obtain serum chemistries to rule out evidence of incipient ketosis as evidenced by an abnormal anion gap (>10 mEq/L). A blood gas test can be helpful to confirm the presence and determine the severity of diabetic ketoacidosis (DKA). The presence of urine ketones is not specific for DKA and can be seen in the setting of short-term starvation (ketones are concentrated in the urine and are found in situations in which minimal serum ketones are detected).

I would give this patient an initial dose of rapid-acting insulin and then reinstate treatment with basal insulin. Because of the uncertainty regarding her previous medical care, I would not initiate insulin at her prior doses but rather initiate basal insulin (either glargine or neutral protamine Hagedorn [NPH]) at a starting dose of 0.2 unit/kg, with the intention of titrating the dose upward to optimize glycemia.

The majority of readers selected the above-mentioned response (d.) as the most appropriate therapy for this patient. A few readers indicated their preference to either: (1) admit this patient to the hospital with a presumptive diagnosis of DKA and begin work-up; or (2) administer 10 units of regular or short-acting insulin and then add one half of her previously prescribed dose of NPH and regular insulin.

Question 2. Which set of data would best confirm a diagnosis of DKA?

Answer: b. Glucose, 250 mg/dL; Urine pH level, 7.3; Bicarbonate (HCO_3) level, 12; Anion gap, 12 mmol.

DKA is a metabolic derangement defined by hyperglycemia, ketonemia, and acidosis. It is most typically seen in type 1 DM, and more rarely in type 2 DM, in the context of insulin omission and an additional physical stressor. The criteria for the diagnosis of DKA include: (1) serum glucose >250 mg/dL; (2) arterial pH <7.3 ; (3) serum HCO_3 <15 mEq/L; (4) serum osmolality <320 mOsm/kg; and (5) urine ketones >3 and positive serum ketones. Answer (b.) most closely approximates these criteria.

With only one exception, all readers who responded to this question chose (b.) as the best set of data that would confirm a diagnosis of DKA.

Question 3. When switching a patient from NPH/regular insulin twice daily to insulin glargine plus short-acting insulin, one should:

Answer: b. Reduce the dose of insulin glargine by 20% compared with the total daily IU dose of NPH insulin, and adjust as needed.

When switching from NPH BID to glargine, it is recommended that the total dose be reduced by 20%, with subsequent titration based on blood glucose monitoring. When switching from NPH QD to glargine, no dose adjustment is required.

The majority of readers selected the above-mentioned response (b.) as the appropriate approach to switch a patient from NPH/regular insulin BID to insulin glargine plus short-acting insulin. It is not recommended to use the same total dose of insulin for both regimens. Nor is it recommended to treat the patient as one would an insulin-naive patient with insulin glargine (10 units QD and adjust as needed).

Question 4. What type of diabetes does this patient have? What are the differences between gestational diabetes and type 2 DM?

Answer: Type 2 DM. See the discussion above.

Readers expressed a diversity of opinions in response to this question, with the majority concluding type 2 DM is the appropriate diagnosis. Some readers reflected an acute awareness that GDM is a sign of insulin resistance, pointing toward a 50% likelihood of developing type 2 DM. One reader suggested that obesity is regarded as the main trigger for this patient, using the term “diabesity” to describe this situation. Several readers highlighted the need to provide practical guidance and ongoing follow-up care about the benefits of lifestyle changes (namely, diet and exercise), encouraging this patient and others who have experienced GDM to make lifestyle changes that help reduce the risk of diabetes complications.

Readers are invited to consider a new Case Study (see page 79) and submit responses to www.InsulinJournal.com before the deadline.