Chapter 14  Drugs for Treating Diabetes Mellitus

Case Study
The girl’s lacrosse team you are covering is into its third overtime. You know that Cate, the team’s center, has played the entire game and continues to play as the game goes into its fourth overtime. You also know that she has had type 1 diabetes mellitus since she was 4 years old. She takes very good care of herself (eg, controls her diabetes with her insulin pump, eats a healthy diet, uses regular glucose testing), so she is usually not a concern for you. However, you notice that Cate has not been attentive to the game during the past several minutes, missing several passes. She is also stumbling and is not her normally coordinated self. During the break between the third and fourth overtimes, you have Cate test her blood glucose level and find that she has a reading of 58 mg/dL. As you observe her testing her glucose level, you notice other signs that tell you she is having a hypoglycemic episode. You inform the coach that Cate will not be able to play in the next overtime period. What are the hypoglycemic signs you are likely to see in Cate? What are your options to manage her hypoglycemia?

Answer: The initial symptoms of hypoglycemia include sweating, inability to concentrate, palpitations, tachycardia, tremor, and anxiety. As hypoglycemia progresses, the patient may develop a headache, blurred vision, drowsiness, and confusion. Ultimately, this can proceed to coma. However, remember that some patients may not experience all of the symptoms of hypoglycemia. For example, some type 1 diabetic patients may develop hypoglycemia unawareness and must rely on glucose testing to monitor for this complication. Beta-blockers such as propranolol can also mask some of the symptoms of hypoglycemia. If a patient is experiencing hypoglycemia, a source of glucose needs to be provided. Fifteen to 20 g of glucose orally is recommended. Examples of carbohydrates containing 10 g of glucose include one-half cup of orange juice or 6 Life Savers (Wm. Wrigley Jr. Company).

Exam Questions
1. Which of the following would be classified as a long-acting insulin?
   a. Insulin aspart (NovoLog).
   b. Insulin glargine (Lantus).
   c. Regular insulin (Humulin R).
   d. Neutral protamine Hagedorn (NPH) insulin (Humulin N).

2. Insulin is stable at room temperature for approximately:
   a. 1 week.
   b. 2 weeks.
   c. 1 month.
   d. 3 months.

3. Which of the following best describes common symptoms of hypoglycemia?
   a. Sweating, confusion, tachycardia.
   b. Excitability, double vision, tachycardia.
   c. Drowsiness, impaired gait, bradycardia.
   d. Headache, insomnia, bradycardia.

4. Which agent can be used in combination with insulin for the treatment of type 1 diabetes mellitus?
   a. Metformin (Glucophage).
   b. Liraglutide (Victoza).
c. Pramlintide (Symlin).
d. Acarbose (Precose).

5. The sulfonylureas lower glucose levels by:
   a. Inhibiting glucose prevention in the liver.
   b. **Increasing the release of insulin from the pancreas.**
   c. Promoting glucose uptake by skeletal muscle.
   d. Blocking reabsorption of glucose by the kidney.

6. Which adverse effect is associated with the sodium-glucose–linked transporter (SGLT) inhibitors?
   a. **Increased risk of urinary tract infections.**
   b. Increased risk of pancreatitis.
   c. Increased risk of myocardial infarction.
   d. Increased risk of lactic acidosis.

7. Which of the following antidiabetic agents is considered contraindicated in patients with New York Heart Association Functional Class III heart failure?
   a. Acarbose (Precose).
   b. **Rosiglitazone (Avandia).**
   c. Liraglutide (Victoza).
   d. Sitagliptin (Januvia).

8. The injection site that gives the most consistent insulin absorption is the:
   a. Thigh.
   b. Arm.
   c. **Abdomen.**
   d. Buttock.

9. Which class of medications can mask the symptoms of hypoglycemia?
   a. β-receptor agonists.
   b. **β-receptor antagonists.**
   c. Corticosteroids.
   d. Thiazide diuretics.

10. A fasting plasma glucose greater than or equal to ____ mg/dL meets the criteria for diagnosis of diabetes mellitus.
    a. 100.
    b. **126.**
    c. 180.
    d. 200.