Case Study 3: Y.L.

Scenario

Y.L. makes an appointment to come to the clinic where you are employed. She has been complaining of chronic fatigue, increased thirst, constantly being hungry, and frequent urination. She denies any pain, burning, or low back pain on urination. She tells you she has a vaginal yeast infection that she has treated numerous times with OTC (over-the-counter) medication. She admits to starting smoking since going back to work full time as a clerk in a loan company. She also complains of having difficulty reading numbers and reports making frequent mistakes. She says by the time she gets home and makes supper for her family, then puts her child to bed, she is too tired to exercise. She reports feet hurt; they often "burn or feel like there are pins in them." She reports that after her delivery, she went back to her traditional eating pattern which you know is high in carbohydrates.

In reviewing Y.L.'s chart, you notice she has not been seen since the delivery of her child 6 years ago. She has gained a considerable amount of weight; her current weight is 173 lb. Today her BP is 152/97 mm Hg and her plasma glucose is 291 mg/dL. The PCP (primary care provider) orders the following labs: UA, HbA1c (hemoglobin A1c), fasting CMP, CBC, fasting lipid profile, and a baseline 24-hour urine collection to assess Creatinine clearance. The lab values are as follows: fasting glucose 184 mg/dL, A1c 10.4, UA +glucose, -ketones, cholesterol 256 mg/dL, triglycerides 346 mg/dL, LDL (low-density lipids) 155 mg/dL, HDL (high-density lipids) 32 mg/dL, ratio 8.0. Y.L. is diagnosed with type 2 diabetes.

After meeting with Y.L. and discussing management therapies, the PCP decides to start MDI (multiple dose injection) insulin therapy and have the patient count carbohydrates. Y.L. is scheduled for education classes and is to work with the diabetes team to get her blood sugar under control.

1. Identify the three methods used to diagnose DM.
   - **Hemoglobin A1C (6.5 and above)**
   - **Fasting blood glucose (greater than 126)**
   - **Random Blood glucose (greater than 200) with present symptoms of DM.**

2. Identify three functions of insulin.
   - **Is a lock and key, that allows glucose to go into a cell to be used as energy.**
   - **Brings hyperglycemic levels back down to normal range.**
   - **Used as treatment for both Type 1 and Type 2 DM.**

3. Insulin's main action is to lower blood sugar levels. Several hormones produced in the body inhibit the effects of insulin. Identify three.
   - **Glucagon**
   - **Epinephrine**
   - **Stress hormone: Cortisol**

4. Y.L. was stated on lispro (Humalog) and glargine (Lantus) insulin with carbohydrate counting. What is the most important point to make when teaching the patient about glargine?

Glargine needs to be administered the exact same time every single day, it does not matter if you chose to administer it in the morning or evening.

5. Because Y.L. has been on regular insulin in the past, you want to make sure she understands the difference between regular and lispro. What is the most significant difference between these two insulins?

Insulin Lispro is a rapid acting insulin with an onset of 15-30 minutes and peaks in 30-90 minutes compared to regular insulin being a slower acting insulin with an onset of 30-60 minutes and peaks in 2-3 hours. So Lispro needs to be administered with meals or eat within 15 minutes to prevent hypoglycemia.

6. What is the peak time and duration for lispro insulin?
Peak time is thirty to ninety minutes and the duration is three to five hours.

7. Y.L. wants to know why she can't take NPH and regular insulin. She is more familiar with them and has taken them in the past. Explain why the provider chose lispro and glargine insulin over NPH and regular insulin?

Lispro and Glargine provide better glycemic control since Lispro provides a faster onset of 15-30 minutes compared to Regular insulin and Glargine keeps blood levels steady by releasing insulin at a slow rate over 24 hours without a peak time compared to NPH having a peak time of 4-6 hours.