

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.
 - Y.L. is experiencing the 3 P's, polyuria, polydipsia, and polyphagia. Y.L. is also experiencing a pins and needles feeling in her feet which is a classic sign of DM. Y.L. had her A1C drawn, and that came up to be 10.4 which is a positive diagnosis of DM. Her fasting blood glucose was 184, and she's experiencing symptoms, therefore a positive diagnosis can be drawn from that. A UA is looked at, and can confirm that glucose is in the urine. Lastly, her cholesterol is 256 (normal below 200), triglycerides are 346 (normal below 150), and her LDL is 155 (normal below 100). All these lab values along with the symptoms she's been experiencing proves that she has a positive diagnosis of DM.
2. Identify three functions of insulin.
 - Insulin binds to receptors on cells which allow glucose to flood the cell. This brings down the blood glucose level.
 - Insulin helps increase cell's permeability to K⁺, Phosphate, and Mg.
 - Insulin inhibits the breakdown of fat in adipose tissue.
3. Insulin's main action is to lower blood sugar levels. Several hormones produced in the body inhibit the effects of insulin. Identify three.
 - Epinephrine
 - Cortisol
 - Glucagon
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?
 - It is important to teach Y.L. that Glargine is a long-acting insulin. This means it stays in the body and has an effect for about 24hrs. Because of this, glargine needs to be taken at the same time every day. It can be taken any time during the day as long as it's the same every day. It's also important to teach that glargine shouldn't be mixed with any other insulin.
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?

-Lispro is a rapid acting insulin. It takes about 15-30 minutes to begin working, so it's very important to eat a meal immediately after administering Lispro. Lispro peaks at about 30-90 min and only last 3-5 hrs. Whereas, regular insulin takes about 30-60 minutes to begin working, peaks at 2-3 hrs, and lasts 5-7 hrs. The most important thing to remember is to eat a meal within 15 minutes of administering Lispro.

6. What is the peak time and duration for lispro insulin?

-The peak time for Lispro is 30-90 minutes and it's duration is 3-5 hrs.

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?

-The provider chose Lispro insulin to have a faster acting insulin in the body to use when eating meals since she has a busy schedule throughout the day. This places her at a lower risk for hyperglycemia. They chose glargine to provide more coverage over the span of the whole day. Whereas, regular insulin takes longer to kick in than Lispro, and NPH covers a less period of the day compared to glargine.