Case Study 17: Adult Type 2 Diabetes Mellitus: Transition to Insulin

Nicole Alai

San Francisco State University

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1. The Standard diagnostic criteria for T2DM include a BMI at or greater than 25, old age, physically inactive, relative with diabetes, member of high risk ethnic population, diagnosed with gestational diabetes, hypertensive, impaired glucose tolerance, conditions with insulin resistance and history of vascular disease. Mitch is 53 years old, mildly obese, no physical activity, mom had T2DM, has HTN, has acute hyperglycemia, hyperlipidemia and gout.

2. Metformin is a Biguanid and it decreases hepatic glucose production and increases insulin uptake into the muscles and it helps with weight control and has cardiovascular benefits. Some side effects seen include: transient diarrhea, nausea, bloating anorexia, flatulence, lactic acidosis (rare) not okay for individuals with renal insufficiency, liver failure, or treated CHF. Possible food interactions are decreased folate and vitamin B absorption, alcohol influenced and to decrease GI distress take with meals. Glyburide is a second generation sulfonylurea agent and it stimulates insulin secretion and some side effects are hypoglycemia mostly seen in another drug in the same class and it isn't suitable for individuals with renal insufficiency. Alcohol should be avoided when taking this drug because it has possible food-drug interactions.

5. HHS also called hyperglycemic hyperosmolar syndrome is characterized by blood glucose levels of greater than 600 mg/dL, serum osmolality of greater than 320 mOsm/kg of water, and an absence of ketoacidosis. Symptoms are dehydration, polyuria, polydipsia, polyphagia, confusion, warm/dry skin, fever, and sleepiness. These symptoms are not noticeable and can be easily overlooked. DKA also know as diabetic ketoacidosis a severe form of hyperglycemia and is life threatening. Symptoms include nausea, vomiting, stomach pain, fruity or acetone breath, kussmaul respirations and mental status changes. The information and signs that support Mitch’s diagnoses of HHS include: glucose levels were 1524 mg/dL (2.5 times the normal levels), his dry mucous membranes, cloudy, amber colored urine, coworker reports seeing patient look confused and drowsy, a temperature of 100.5, and high osmolality serum levels.

9. The insulin therapy that was started for Mitch from the previous doctor include glyburide to help stimulate the release of insulin from the pancreas. Lispro is a rapid-acting insulin analog and it happens within 5-15 minutes of injection. It peaks at 30-90 hours and lasts for 3-5 hours.
Glargine is a long-acting analog on the onset is 2-4 hours and it has not peak and its duration is 20-24 hours.

11. The basic principles for Mitch’s nutrition therapy in controlling DM involve restricting stabilizing calories, distributing carbohydrates evenly throughout the day, adjusting amount of carbohydrates to glucose tolerance, modifying fat intake by decreasing saturated and trans fat, incorporating simple carbohydrates into the meal plan, providing nutrition counseling based on patients age and literacy levels, and encouraging physical activity.

12. Mitch’s current weight and BMI are 214 lb and 31kg/meters squared. his ideal body weight is 160. A healthy weight range for Mitch would be 10% of his current weight so roughly around 192lb so a rang of 185-195lbs.

13. Mitch’s laboratory results show a low sodium and phosphate, and high levels of blood urea nitrogen, creatinine serum, glucose and osmolality characteristics of hyperosmolar hyperglycemic state. Signs include: dehydration, high blood sugar and high osmolarity. After hydration and an initial treatment consisting of some electrolyte replacement, intravenous fluids and insulin, we saw an increase in sodium and phosphate levels and a decrease in blood urea nitrogen, creatinine serum, glucose and osmolality.

14. Mitch’s energy and protein requirements for weight management are 1,902 kcal/kg and 58g/kg respectively. Energy intakes recommended for weight management vary depending on whether it is carbohydrate, fat or protein. The amount of carbohydrates that can be consumed per meal is 45-60 grams and, 20-35 grams of fiber should be consumed per day. Carbohydrate must be roughly 50-60% of his daily calories. Energy intake for protein must be 10-20% of total calories and fat should be 25% of calories, less than 7% should be from saturated fat.

15. The first PES statement can be excessive energy intake related to eating out frequently as evidence by patient intake history. The second is excessive weight gain related to no physical activity as evidence by BMI of 31.
16. Diabetics require 50-60% of their calories to be carbohydrates. Mitch’s initial carbohydrate prescription based on the assessment of his energy requirement should have been 951-1141 of his calories per day. His intake consisted of one bagel at 96 cal., one jimmy john sub at 192 cal., 64 cal. for chips, 3 cal. for soda, 464 cal. from two potatoes consumed at dinner, and 8 calories for a salad. Mitch falls slightly below the 50-60% range of required carbohydrates per day based on his usual carbohydrate intake for the past several months.

17. The first nutritional goal to assist with weight loss is to consume less than 7% saturated fat of total calories. A second nutritional goal would be to increase physical activity 3-5 day a week with 30 minutes of walking or jogging.