**January 2017 StuNews Clinical Case**

**Reviewed by 2016 Clinical Pharmacy Challenge Exam Review Panel**

Vignette: A 45-year-old African American woman comes to her primary care appointment for a follow-up on her chronic conditions, but also because of recent edema. She is also seeking treatment of obesity.

Medical History: Hypertension, type 2 diabetes, osteoarthritis, obesity, depression

Social History: Negative for smoking, alcohol intake, illicit drug use

Family History: (+) Diabetes in mother and paternal grandmother; father died of myocardial infarction at age 79; mother died of massive stroke at age 78; siblings (five) are alive and well

Current Medications: Metformin 1000 mg by mouth twice daily; lisinopril 20 mg by mouth once daily; pravastatin 10 mg by mouth at bedtime; amlodipine 10 mg orally once daily; sertraline 50 mg by mouth once daily; hydrocodone/acetaminophen 5/325 mg by mouth every 6 hours as needed for pain

Allergies: No known drug allergies

Vital Signs: BP 148/94 mm Hg; HR 80 beats/minute; Temp 98.5°F (36.9°C); RR 18 breaths/minute; weight 85 kg (188 lb) (83 kg [184 lb] 6 months ago); height 152 cm (60 inches); body mass index 36.7 kg/m2

Laboratory Values: Sodium 140 mEq/L (140 mmol/L); Potassium 4.0 mEq/L (4.0 mmol/L); Chloride 95 mEq/L (95 mEq/L); BUN 14 mg/dL (4.99 mmol/L); SCr 0.8 mg/dL (70.72 micromoles/L); glucose 175 mg/dL (9.7 mmol/L); A1C 7.5% (0.075%); ALT 15 IU/L; AST 21 IU/L; LDL 176 mg/dL (4.56 mmol/L); TG 292 mg/dL (3.3 mmol/L); TC 280 mg/dL (7.25 mmol/L)

Procedures: ECG = normal sinus rhythm

Other: 10-year atherosclerotic cardiovascular disease (ASCVD) risk = 20.1% using the Pooled Cohort Equation

**Question 1**

What is the patient’s A1C goal, according to the American College of Clinical Endocrinologists (AACE) guidelines?

1. Less than 7.5% (0.75%)
2. Less than 7% (0.07%)
3. Less than 6.5% (0.065%)
4. Less than 6% (0.06%)

Answer: 3. Less than 6.5% (0.065)

Rationale: According to AACE, a patient’s concurrent illnesses and risk of hypoglycemia should be considered when determining a more or less stringent goal. Although the patient has chronic conditions, she has no significant microvascular (i.e., retinopathy) or macrovascular (i.e., myocardial infarction) complications. In addition, she is only taking metformin, which has a low risk of hypoglycemia. Therefore, a more stringent goal is warranted at less than 6.5% (0.065%), which is recommended by AACE. An A1C of less than 8% ( 0.08%)is generally recommended by the American Geriatrics Society. Option 1 is not a general goal for any guidelines. Option 2 may be a general goal of the American Diabetes Association (ADA). Option 4 is very stringent and is not a current recommendation by any guideline; also, it may be associated with a significant risk of hypoglycemia.

Citation: Abrahamson MJ, Barzilay JI, Blonde L, et al. AACE comprehensive diabetes management algorithm 2013. Endocr Pract 2013;19:327-36.

**Question 2**

Which of these medications is most likely contributing to the patient’s edema?

1. Acetaminophen
2. Amlodipine
3. Lisinopril
4. Pravastatin

Answer: 2. Amlodipine

Rationale: Amlodipine is the most likely agent to cause edema, which may be contributing to the patient’s weight gain. The other medications are not associated with edema or weight gain.

Citation: Malone M. Medications associated with weight gain. Ann Pharmacother 2005;39:2046-55.

**Question 3**

Which statin recommendation (given orally at bedtime) is MOST appropriate according to the American College of Cardiology/American Heart Association 2013 guideline on cholesterol?

1. Atorvastatin 5 mg orally at bedtime
2. Pravastatin 40 mg orally at bedtime
3. Rosuvastatin 20 mg orally at bedtime
4. Simvastatin 40 mg orally at bedtime

Answer: 3. Rosuvastatin 20 mg orally at bedtime

Rationale: The patient would fit into one of the four patient populations requiring a statin therapy to prevent cardiovascular events. She is 40–75 years of age but also has a diagnosis of diabetes. Therefore, a moderate- to high-intensity statin is warranted. In patients with diabetes (40–75 years, LDL 70–189 mg/dL [1.8 – 4.9 mmol/L]), a high-intensity statin should be considered with a 10-year ASCVD risk of 7.5% or greater. Because her ASCVD as calculated by the Pooled Cohort Equation is 20.1%, a high-intensity statin is preferred. Rosuvastatin (option 3) is the only listed choice with a high-intensity dose. Options 1 and 2 are considered low intensity. Option 4 is moderate intensity; however, it would not be optimal if the patient continues taking amlodipine because of increased myopathy risk.

Citation: Goff DC, Lloyd-Jones DM, Bennett G, et al. 2013 ACC/AHA guideline on the assessment of cardiovascular risk: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. Circulation 2014;129(25 suppl 2):S49-73.

**Question**

Which medication is the most appropriate option for the treatment and management of the patient’s obesity?

1. Bupropion and naltrexone
2. Liraglutide
3. Lorcaserin
4. Phentermine and topiramate

Answer: 2. Liraglutide

Rationale: Option 1 is contraindicated because the patient is taking hydrocodone for osteoarthritis (i.e., opioid antagonist plus opioid agonist). Option 4 would not be best because the patient’s blood pressure is uncontrolled and above the desired goal. Option 3 would not be appropriate because the patient is taking an SSRI (selective serotonin reuptake inhibitor), which would interact with lorcaserin (i.e., increased risk of serotonin syndrome). Therefore, the best agent is option 2 (liraglutide); the patient has no precautions against or contraindications to this medication.

Citations:Belviq (lorcaserin) [package insert]. Zofingen, Switzerland: Arena Pharmaceuticals, 2012.

Qsymia (phentermine/topiramate) [package insert]. Mountain View, CA: VIVUS, 2013.

Astrup A1, Rössner S, Van Gaal L, et al. Effects of liraglutide in the treatment of obesity: a randomised, double-blind, placebo-controlled studyLancet 2009;374:1606-16.

Astrup A1, Carraro R, Finer N et al.Safety, tolerability and sustained weight loss over 2 years with the once-daily human GLP-1 analog, liraglutide.Int J Obes (Lond) 2012;36:843-54.

Greenway FL1, Fujioka K, Plodkowski RA et al. Effect of naltrexone plus bupropion on weight loss in overweight and obese adults (COR-I): a multicentre, randomised, double-blind, placebo-controlled, phase 3 trial.Lancet 2010;376:595-605.

Apovian CM, Aronne L, Rubino D, et al. A randomized, phase 3 trial of naltrexone SR/bupropion SR on weight and obesity-related risk factors (COR-II) Obesity. 2013;21:935–43. doi: 10.1002/oby.20309

**Question 5**

Which is the most appropriate recommendation for the treatment of her type 2 diabetes?

1. Canagliflozin 300 mg orally once daily
2. Glipizide 10 mg orally twice daily
3. Insulin glargine 10 units subcutaneously at bedtime
4. No additional therapy needed; patient is at goal

Answer: 1. Canagliflozin 300 mg orally once daily

Rationale: The best agent would be canagliflozin (option 1) because it can help lower glucose concentrations, blood pressure, and weight. Options 2 and 3 can cause weight gain, which would not meet the patient’s goal because she is expressing weight loss at today’s visit. The patient’s A1C is at neither the ADA nor the AACE goals, and additional therapy is warranted (option 4 is incorrect).

Citation: Inzucchi SE, Bergenstal RM, Buse JB, et al. Management of hyperglycemia in type 2 diabetes, 2015: a patient-centered approach. Update to a position statement of the American Diabetes Association and the European Association for the Study of Diabetes. Diabetes Care 2015;38:140-9.