**2016 ACCP StuNews June Case**

**Reviewed by 2015 ACCP Clinical Pharmacy Exam Panel**

Vignette: A 58-year-old man presents to the emergency department after recently being diagnosed with small cell lung cancer (SCLC). The patient admits to severe fatigue, decrease in appetite, lack of fluid intake, and some disorientation and confusion in the past 3 days. The patient did receive cycle 2 of his chemotherapy regimen 5 days ago consisting of etoposide/cisplatin.

Past Medical History: Chronic obstructive pulmonary disease (COPD); hypertension; type 2 diabetes mellitus; Seasonal allergies

Social History: (-) alcohol, 20 pack/year tobacco history

Current Medications: Hydrochlorothiazide 25 mg daily; metformin 500 mg twice daily; loratadine 10 mg daily

Allergies: No known drug allergies (NKDA)

Vital Signs: Blood pressure 95/78 mm Hg; heart rate 115 beats/minute; temperature 37°C (98.7°F); height 172.7 cm; weight 60 kg

Lab Values: Sodium 142 mEq/L (142 mmol/L); potassium 3.7 mEq/L (3.7 mmol/L); chloride 107 mEq/L (107 mmol/L); bicarbonate 21 mmol/L (21 mmol/L); blood urea nitrogen 42 mg/dL (15 mmol/L); serum creatinine 1.3 mg/dL (114.92 micromoles/L); calcium 15 mg/dL (3.75 mmol/L); albumin 1.8 g/dL (18 g/L)

Procedure Data: Chest x-ray: Large tumor protruding into superior vena cava

Other Data: Physical examination reveals jugular venous distention (JVD) and facial plethora

**Question 1**

What is this patient’s corrected calcium?

1. 15 mg/dL (3.75 mmol/L)
2. 16.7 mg/dL (4.18 mmol/L)
3. 17.3 mg/dL (4.33 mmol/L)
4. 18.1 mg/dL (4.53 mmol/L)

Answer: 2. 16.7 mg/dL (4.18 mmol/L)

Rationale: The patient’s corrected calcium is 15 + [0.8 x (4 − 1.8)] = 16.7 mg/dL (4.18 mmol/L). If calculated correctly, the other options are incorrect.

Citation: Halfdanarson TR, Hogan WJ, Moynihan TJ. Oncologic emergencies: diagnosis and treatment. Mayo Clin Proc 2006;81:835-48.

**Question 2**

How would you classify his hypercalcemia?

1. Asymptomatic
2. Mild
3. Moderate
4. Severe

Answer: 4. Severe

Rationale: Even before correcting for hypoalbuminemia, the patient’s hypercalcemia would still be classified as severe. When corrected, the calcium is 16.7 mg/dL. Asymptomatic is not considered an official classification of hypercalcemia, although patients may have mild to moderate hypercalcemia with no symptoms. Mild hypercalcemia is a calcium < 12 mg/dL, and a calcium of 12–14 mg/dL is considered moderate hypercalcemia.

Citation: Halfdanarson TR, Hogan WJ, Moynihan TJ. Oncologic emergencies: diagnosis and treatment. Mayo Clin Proc 2006;81:835-48.

**Question 3**

Which is the best initial recommendation for treating this patient’s hypercalcemia of malignancy?

1. Discontinue hydrochlorothiazide.
2. Discontinue metformin.
3. Discontinue hydrochlorothiazide and initiate intravenous normal saline.
4. Discontinue metformin and initiate gallium nitrate.

Answer: 3. Discontinue hydrochlorothiazide and initiate intravenous normal saline.

Rationale: The first step in the treatment of hypercalcemia is to remove any source of existing calcium; therefore, hydrochlorothiazide should be discontinued because it is a calcium-sparing diuretic. Aggressive intravenous hydration is also important. Given this patient’s severe hypercalcemia, discontinuation of hydrochlorothiazide alone would be insufficient to adequately treat him, and intravenous normal saline is warranted concurrently (option 3 is correct; option 1 is incorrect). Gallium nitrate is typically not the first treatment option for hypercalcemia (option 4 is incorrect). Discontinuation of metformin would likely have no effect on this patient’s hypercalcemia and could cause an unnecessary rise in his glucose levels (option 2 is incorrect).

Citation: Halfdanarson TR, Hogan WJ, Moynihan TJ. Oncologic emergencies: diagnosis and treatment. Mayo Clin Proc 2006;81:835-48.

**Question 4**

The treatment team wants to add zoledronic acid therapy to his regimen. Given this patient’s renal function, what dose of intravenous zoledronic acid should be recommended?

1. 1 mg
2. 2 mg
3. 4 mg
4. 8 mg

Answer: 3. 4 mg

Rationale: Zoledronic acid 4 mg is the appropriate intravenous dose, despite his renal dysfunction (estimated creatinine clearance 55 mL/minute). Dose adjustments of zoledronic acid are not necessary in treating patients for hypercalcemia of malignancy presenting with mild to moderate renal impairment before initiation of therapy (serum creatinine less than 400 micromoles/L or less than 4.5 mg/dL).

Citation: Zometa [package insert]. East Hanover, NJ: Novartis, 2015.

**Question 5**

After further workup, physical examination, and evaluation of diagnostic tests, this patient is found to have superior vena cava (SVC) syndrome. What treatment is most appropriate?

1. Allopurinol
2. Enoxaparin
3. Dexamethasone
4. Calcitonin

Answer: 3. Dexamethasone

Rationale: Corticosteroids have been used to decrease the inflammation associated with the tumor and SVC syndrome. Although no clinical benefit has been firmly established, steroids are still the pharmacologic drugs of choice. Other treatment options include placing a stent, starting radiation therapy, and initiating chemotherapy (this patient was already on chemotherapy). Allopurinol is not appropriate for the treatment of SVC syndrome, although it is used for the prevention and treatment of tumor lysis syndrome. Enoxaparin might be appropriate if the patient had experienced a clot because of a catheter tip; however, that is not apparent in this case. Calcitonin is not appropriate for this patient’s SVC syndrome, although it may be used to treat severe cases of hypercalcemia of malignancy.

Citation: Halfdanarson TR, Hogan WJ, Moynihan TJ. Oncologic emergencies: diagnosis and treatment. Mayo Clin Proc 2006;81:835-48.