
Hypercalcemia and Altered Mental Status

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CASE DESCRIPTION

A 72-year-old man presented to the emergency department with a 3-day history of slurred speech, altered mental status, and unstable gait. His family reported a 14-pound weight loss over the past 3 months, along with decreased energy, shortness of breath on exertion, and fatigue. Physical examination was remarkable for generalized weakness, pallor, and tachycardia with a heart rate of 102 beats per minute. Other vital signs include blood pressure, 149/80 mmHg; temperature, 36.1 °C (97 °F); and respiratory rate, 16 breaths per minute. His medical history was significant for hypertension, hyperlipidemia, and benign prostatic hyperplasia. According to his medical records, a colonoscopy performed 8 years earlier was unremarkable. He had a previous history of smoking (34 pack-years). He had no history of hematochezia or melena.

Initial laboratory results are shown in Table 1. Stool guaiac testing was negative. Brain CT (computed tomography) scan ruled out a cerebrovascular accident, intracranial hemorrhage, or mass lesion in the brain. The patient was managed with intravenous normal saline, calcitonin, and pamidronate for hypercalcemia. He was transfused with 2 units of packed red cells for symptomatic anemia. Extensive workup for the primary cause of hypercalcemia ensued.

QUESTIONS TO CONSIDER
• What are the signs/symptoms of hypercalcemia?
• What are the differential diagnoses in this patient?
• What is the most probable diagnosis?

Table 1. Selected laboratory results. ^a		
Test	Reference interval	Patient result
White blood cell count	4.20-10.70 × 10 ³ /μL	13.82
Red blood cell count	4.26-5.52 × 10 ⁶ /μL	1.88
Hemoglobin	12.2-16.4 g/dL	6.4
Hematocrit	38.4-49.3%	18.9
MCV ^b	81.7-95.6 fL	100.5
Ferritin	18.0-464.0 ng/mL	629.0
Iron	50-160 μg/dL	122
Total iron binding capacity	250-410 μg/dL	173
Iron saturation	20-50%	71
Platelet count	150-328 × 10 ³ /μL	221
Sodium	135-145 mmol/L	144
Potassium	3.5-5.0 mmol/L	3.6
Chloride	98-108 mmol/L	100
Total CO ₂ (bicarbonate)	23-31 mmol/L	28
Anion gap	2-16	16
BUN	7-23 mg/dL	21
Glucose	70-110 mg/dL	116
Creatinine	0.60-1.25 mg/dL	1.99
eGFR Calculation (African-American)	mL/min/1.73m ²	40.2
Phosphorus	2.5-5.0 mg/dL	4.9
Calcium	8.6-10.6 mg/dL	13.8
Ionized calcium	4.50-5.30 mg/dL	6.80^c
Total protein	6.3-8.2 g/dL	14.7
Albumin	3.5-5.0 g/dL	3.8
Alcohol	<10 mg/dL	<10
Osmolality	278-305 mOsm/kg	306
CRP	<0.8 mg/dL	2.7
PTH	12-88 pg/mL	4.5^c

^a Abnormal results are in bold.

^b MCV, mean corpuscular volume; BUN, blood urea nitrogen; CRP, C-reactive protein; PTH, parathyroid hormone.

^c Ionized calcium and PTH were performed the day after presentation. All remaining tests were performed on the day of presentation.

Final Publication and Comments

The final published version with discussion and comments from the experts will appear in the July 2019 issue of *Clinical Chemistry*. To view the case and comments online, go to <http://www.clinchem.org/content/vol65/issue7> and follow the link to the Clinical Case Study and Commentaries.

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