

CLINICAL VIGNETTE

Amiodarone Induced Myxedema Coma

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Case Presentation

An 81-year-old female with Parkinson's Disease and associated autonomic dysfunction with hypotension, osteoarthritis, hyperlipidemia, and depression presented to the emergency room for staple removal from a head laceration she received from a fall about two weeks prior. Her vital signs were oral temperature 34.4°C, pulse 51 beats per minutes, blood pressure 140/72 mmHg, respiratory rate 16 breaths per minutes, and oxygen saturation 95% on room air. In addition to the staple removal, she had complaints of weakness, chills, and cold sweats. She denied fevers, dysuria, abdominal pain, nausea, vomiting, or diarrhea.

Her medications included memantine, donepezil, carbidopa/levodopa, citalopram, fludrocortisone, simvastatin, amiodarone 100 mg by mouth daily, potassium chloride, midodrine, aspirin, and clonazepam.

She lives with her husband who also has Parkinson's Disease. They rely on a 24-hour caregiver for help with activities of daily living. She was a former smoker who quit more than 50 years ago. She drank one alcoholic beverage weekly on average.

On exam, she was thin and well-appearing. She had difficulty speaking. Her sclera were anicteric without conjunctival pallor. Her tongue was normal size. She had a chronic non-reactive left pupil. Her neck was supple. Her posterior scalp wound was healing well. Her heart rate was regular, but bradycardic and no murmurs were appreciated. There was no lower extremity edema or erythema. She had cogwheel rigidity in both her upper and lower extremities bilaterally with a large ecchymosis on her right knee and anterior shin.

Her laboratory evaluation revealed: WBC 5.74, hemoglobin 9.5, platelets 180, sodium 137, potassium 3.5, chloride 100, bicarbonate 31, BUN 27, creatinine 1.3, and a glucose 112. Historic labs reviewed included TSH 4.6 10 months before. CXR revealed no acute disease and additional workup was sent including repeat TSH, lactate level, CK level, VBG, urinalysis and urine culture, blood cultures, and HIV testing. She was passively rewarmed using a warm air blanket and was started on empirical piperacillin/tazobactam.

The following day, her labs were essentially unchanged. Her temperature had normalized. Her urinalysis revealed hyaline casts, and her cultures were negative. She was discharged home on empirical levofloxacin. At the time of discharge, her TSH had not resulted.

Later that evening, she had become unresponsive and her husband called 911. She had stopped breathing but was resuscitated in the field and brought to an outside hospital. On arrival to the emergency room, she had a temperature of 97.9, blood pressure 119/95 mmHg, pulse of 76 beats per minutes, respirations of 24 breaths per minutes, and oxygen saturation of 100% on simple face mask. She continued to deteriorate and needed higher oxygen requirements. In addition, her mental status was declining rapidly, and she was intubated to protect her airway. Laboratory evaluation was notable for an ABG with pH 7.36, pCO₂ of 41.7, pO₂ of 209.2, and bicarbonate of 23.2. Her sodium was 140, potassium 2.9, chloride 107, bicarbonate 21, BUN 18, creatinine 1.5, and a glucose of 83. Her troponin was 0.03. Thyroid studies was significant for a TSH of 175, a free T₃ of 1.4, and a free T₄ of 0.47. A random cortisol level was 182.2. Thyroglobulin antibody was less than 0.9 and a thyroid peroxidase antibody was 0.7. Emergent endocrinology consult started intravenous hydrocortisone, triiodothyronine, and levothyroxine to treat her myxedema coma.

Discussion

Myxedema coma is a state of decompensated hypothyroidism. While there is no established definition, it is usually defined by its cardinal manifestations of altered mental status and hypothermia. Myxedema, which is non-pitting edema, and coma are uncommon symptoms of the disease. When coma is used as diagnostic criteria, it is even more rare with approximately 200 cases reported from 1953 to 1996.¹ Amiodarone related myxedema coma was first reported in 1971 with fewer than ten subsequent published cases. Our case of this rare complication of hypothyroidism is an even rarer case related to amiodarone.

Risk factors for amiodarone-induced hypothyroidism include older age, female gender, elevated baseline TSH levels, amiodarone dosing at greater than 200 mg/day, underlying autoimmune thyroid disease, cyanotic heart disease, preexisting thyroid conditions, and residing in an iodine sufficient region.² Amiodarone causes hypothyroidism by inhibiting 5'-deiodinase preventing the peripheral conversion of T₄ to T₃, inhibiting the entry of T₄ into tissues, blunting of the effect of T₃ on thyroid receptors, and release of iodine exerting a negative feedback on the thyroid gland.³ Our patient had at least two risk factors: her advanced age and female gender. Her TSH was in the normal range earlier that year, and her TPO and thyroglobulin antibodies were negative.

Our patient presented with hypothermia with a recorded temperature of 34.4°C but did not have a deterioration of her mental status until after she returned home. Other manifestations could include hyponatremia, hypoventilation, hypoglycemia, bradycardia, hypotension, and manifestations of mucin deposition in tissue (myxedema) presenting as puffiness of the face, macroglossia, thickened nose, and swollen lips. Diagnosis can usually be established when myxedema coma remains part of the differential for any of the above symptoms.⁴ With readily available TSH assays, the diagnosis can be confirmed by checking TSH, free T4, and cortisol.

Management should start with evaluation of the airway and circulatory system prior to initiating intravenous thyroid replacement. Passive rewarming using room temperature blankets to treat hypothermia should be employed as warming blankets could cause peripheral vasodilation and hemodynamic instability. Before initiating thyroid treatment, intravenous glucocorticoids, usually given as hydrocortisone 100 mcg every 8 hours, should be administered until adrenal insufficiency has been ruled out in order not to precipitate adrenal crisis. Because of the rarity of the disease, there is a paucity of data on the most effective way to replace thyroid hormone. Although rapid correction of hypothyroidism increases the risk of myocardial infarction and arrhythmias, in a small trial, rapid correction was associated with improved mortality.⁵ T4 is usually given as a loading dose between 200 to 500 mcg followed by a daily dose of 1.6 mcg/kg. If triiodothyronine is given, it should be stopped as soon as symptoms improve. Unless the amiodarone is ineffective, there is no evidence that it should be stopped while thyroid hormone is being administered.³

In conclusion, we present a rare case of amiodarone induced hypothyroidism presenting as hypothermia. It is important to emphasize that myxedema coma should remain on the differential of a patient with unexplained hypothermia because the mortality rate of treated myxedema coma has been reported as 30-60%.⁵

REFERENCES

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