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Life threatening hypercalcemia: An unusual cause

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Introduction

Hypercalcemia is commonly seen in patients with primary hyperparathyroidism and malignancy. Rarely, it can be seen in adrenal insufficiency. We report a case of a 42 year old female who presented with altered mental status and weakness. The patient had decreased appetite, nausea and significant weight loss of 60 pounds in the last few months. Laboratory evaluation was significant for hypercalcemia (15 mg/dL) and acute kidney injury (1.5 mg/dL). Work up for malignancy and hyperparathyroidism was negative. She was diagnosed with adrenal insufficiency based on cortisol levels prior to steroids of < 0.5 mcg/dL. She was treated with steroids and her hypercalcemia resolved within two days of steroids. This case shows that adrenal insufficiency may present as hypercalcemia and acute kidney injury. It should be considered as a potential cause while evaluating a patient for hypercalcemia.

Case Presentation

A 42-year-old female with past medical history of hypothyroidism and GERD presented to the emergency department from endocrinologist office with altered mental status and weakness. The patient's family stated that she had decreased appetite, nausea and significant weight loss of 60 lbs in the last few months. She had blood work done at the endocrinologist office and was noted to have elevated calcium level of 15 mg/dL, hypomagnesemia and creatinine 1.5 mg/dL. Patient was also noted to be hypotensive and tachycardic on examination. Initial blood sugar was noted to be 50 mg/dL. Urinalysis showed the presence of bilirubin and negative protein. The patient does not have history of kidney stones, osteoporosis or malignancy. She was initially started on calcitonin 200 units every 6 hr. She was given pamidronate 60 mg IV. She was treated with broad-spectrum antibiotics due to concerns for unknown source of infection. Blood pressure did not improve with crystalloids. The patient also required ventilator and pressor support due to respiratory failure secondary to underlying metabolic encephalopathy and hypotension. Due to significant weight loss she was evaluated for malignancy and underwent computed tomography of chest and abdomen which was negative. She also had bone scan done which was negative. She was started on hydrocortisone 100 mg IV every 8 hours and Florinef 0.05 mg daily on day 2 of hospitalization due to suspicion of adrenal insufficiency which was weaned down through the course of hospital stay. She also had cortisone levels drawn prior to stress dose steroids which was less than 0.5 mcg/dL confirming the diagnosis of adrenal insufficiency. Plasma ACTH was 38 pg/mL, adrenal antibody was >1:8, PTH was 6 pg/mL, 25 hydroxy vitamin-D was 25 ng/mL. Pituitary MRI was negative for masses. Her hypercalcemia and hypotension improved with the steroids.

Discussion

- Hypercalcemia is commonly seen in malignancy and parathyroid disease.
- Adrenal insufficiency is not easily considered as a cause of hypercalcemia as it is rare and patients are not evaluated for it routinely.
- Mechanism of hypercalcemia and in adrenal insufficiency is unclear and not all cases of adrenal insufficiency present with hypercalcemia.
- The prevalence of hypercalcemia at the time of diagnosis of Addison’s disease is reported to be ~5.5%–6.0%.
- Adrenal insufficiency can cause reduction in glomerular filtration rate and hypovolemia which results in reduction in amount of calcium filtered.
- In adrenal insufficiency, 1 alpha hydroxylase activity may be increased which is responsible for conversion of calcitriol to active form of vitamin-D (calcitriol) which causes increased absorption of calcium.
- A paracrine hormone secretion from the adrenal gland called stanniocalcin could be decreased which can result in hypercalcemia by affecting the skeletal calcium efflux into circulation.
- This case, shows that adrenal insufficiency may cause hypercalcemia and can present with hypotension and acute kidney injury.
- Hypercalcemia can cause a decrease in glomerular filtration rate by direct renal vasoconstriction and natriuresis-induced only contraction.
- Kidney injury is related to the duration of the hypercalcemia.
- After excluding the other common causes of hypercalcemia such as malignancy and primary hyperparathyroidism, the patient should be evaluated for hypercalcemia due to adrenal insufficiency.

Conclusion

This case shows that adrenal insufficiency may manifest as hypercalcemia and acute kidney injury, which implicates that adrenal insufficiency should be considered a cause of hypercalcemia in clinical practice.

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