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Case Report
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Acute Adrenal Insufficiency Following Cerebrovascular Accident and Hypothyroidism

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Abstract

The case involves an atypical presentation of Addison's disease in a 37-year-old female, preceded by recent diagnosis of hypothyroidism, Raynaud's disease, and Cerebrovascular Accident (CVA) from an unprovoked Deep Venous Thromboembolism (DVT).

Learning Points: Analyzing whether a hypercoagulable state predisposes patients to the destruction of the adrenal glands leading to superimposed endocrine dysfunction.

Keywords: Primary adrenal insufficiency; Addison's disease; Mineralocorticoids; Adrenal gland infarct

Introduction

Acute Primary Adrenal Insufficiency in the United States is most commonly caused by autoimmune dysregulation leading to adrenalitis, which leads to inflammation and possible destruction of bilateral adrenal cortices [1,2]. Signs and symptoms can be traced back to the three individual sections of the adrenal gland. The glomerulosa is stimulated by angiotensinogen to form aldosterone; its absence causes hyperkalemia, a hypovolemic state due to sodium wasting, and hyponatremia. These effects lead to lightheadedness, orthostasis, and hypotension. The fasciculata is stimulated by Adrenocorticotropic Hormone (ACTH) to form cortisol. Its absence results in decreased vascular tone that causes hypotension and fatigue. Cortisol also serves as a catabolic stress hormone and reductions in cortisol leads to hypoglycemia and possible eosinophilia due to decrease eosinophilic migration leading to infection. The last part of the adrenal gland is the reticularis which makes androgens that increases libido and causes body hair growth. In this specific case, there is reasonable clinical suspicion that a hypercoagulable state could possibly contribute to Primary Adrenal Insufficiency due to recent diagnosis of hypothyroidism, Raynaud's disease, and then an unprovoked DVT resulting in a CVA [3,4].

Case Presentation

The patient is a 37-year-old female diagnosed four months prior with hypothyroidism and Raynaud's Disease and three months prior with a CVA due to a Patent Foramen Ovale (PFO). The patient had recent lab work for surgical clearance of the PFO. Lab results indicated hyponatremia and the patient was instructed to see her primary care physician. Upon presentation, patient was notably bronze; there was hyperpigmentation of skin, palmar creases, and mucosa despite it being in the middle of winter in Michigan. The patient also described hypotensive fatigue blood pressure was 80/60 mmHg, recent nausea, vomiting, chronic fatigue, reduction of body hair, and weight loss of 10 pounds. Due to her recent CVA, hematological concerns were addressed and a full extensive antibody workup was done including antiphospholipid panel, Factor V Leiden genotyping, Protein C and S deficiencies, and prothrombin genotyping all which yielded negative results. The patient also reported no obstetrics/gynecological complications or spontaneous abortions with prior pregnancies. The patient's familial history includes a maternal aunt with lupus and multiple sclerosis.

Lab results indicated severe hyponatremia, hypomagnesemia, hypercortisolism, and elevated ACTH levels. These, in addition to the severe hypotension, are consistent with Addison's disease (Table 1).

Management

Upon presentation to the emergency department, the patient was started on Intravenous (IV) normal saline 1000 ml bolus, IV magnesium, Zofran, and was given hydrocortisone sodium succinate 50 mg IV q12. Stroke prevention measures included Aspirin 81 mg, Plavix 75 mg, Atorvastatin

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Table 1: Emergency department labs.

BMP	
Na	118
K	4.2
CO_2	18 (L)
CL	91 (L)
BUN	7
Creatinine	0.76
Magnesium	1.5 (L)
CBC	
WBC	4.5
HGB	11.6
HCT	34.3
MCV	74
PLT	227
Endocrine	
ACTH	1065
Cortisol AM	2
TSH	5.91
Free T4	0.9

20 mg. Her electrolytes were then trended every 2 h to avoid rapid correction. D5W was given once to avoid rapid correction and over the course of treatment, sodium levels improved. The response to IV steroids was well-tolerated and the transition to Per Os (P.O.) hydrocortisone was made. Imaging included a head CT scan that evaluated the pituitary fossa and was inclusive and ruled out pituitary abnormalities and infract.

Outcome

There was an improvement of hyponatremia. In the future, the patient will need to have high stress dose steroids prior to procedures. Patient will now have P.O. hydrocortisone and a medical bracelet for Addison's disease.

Discussion

In this case report, a patient with recent diagnoses of CVA due to PFO, Raynaud's Disease, and hypothyroidism was found to demonstrate Primary Adrenal Insufficiency (Addison's disease) based on her physical presentation of hyperpigmentation, hyponatremia, hypo magnesium, low cortisol, and severe hypotension.

The differential diagnosis that should be considered is whether the suspected etiology is a consequence of a clotting abnormality that resulted in a thrombus formation of the adrenal glands. Given the recent diagnoses of hypothyroidism, Raynaud's Disease, and unprovoked DVT, there is a possibility of an underlying autoimmune dysregulation.

Due to her recent CVA, the patient received a thrombophilia workup that included Factor V Leiden mutation, antiphospholipid syndrome, and Protein C and S deficiency, all of which were negative. This case took place prior to the COVID-19 pandemic so the patient was not tested for COVID-19. As well there was a lack of follow-up to obtain further studies such as adrenal gland antibody for the patient due to the pandemic.

For future reference, there are additional studies that could have been done. Particularly a CT of the abdomen to rule out infarction of the adrenal glands. There have been cases where acute onset of adrenal insufficiency in healthy women has been attributed to adrenal infarct due to hypercoagulable state.

Conclusion

Acute Primary Adrenal Insufficiency often presents with hypotension, hyponatremia, and hyperpigmentation of the skin and mucosa. The patient's recent diagnoses of hypothyroidism, Raynaud disease, CVA due to unprovoked DVT, and now Addison's may be interconnected. The connection between possible onset of autoimmune abnormalities and recent diagnosis of Addison's disease needs further analysis that includes imaging of the adrenal glands and thrombotic workup.

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