

## Secondary adrenal insufficiency presenting as severe hyponatremia

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### Abstract

#### *Presentation*

A 77-year-old man was referred by his GP for 3 week history of fatigue, anorexia, and nausea.

#### *Diagnosis*

Vital signs including ECG, blood pressure, and pulse were normal.

Routine blood tests were normal except for serum sodium levels which was 119 and serum cortisol level which was also low.

A diagnosis of hyponatremia due to adrenal insufficiency was thus made.

#### *Treatment*

The patient was given hypertonic saline as he had a brief episode of limb jerking and eye-rolling while in the emergency department. Also, he was given hydrocortisone for underlying secondary adrenal insufficiency.

#### *Discussion*

Hyponatremia is a commonly observed electrolyte abnormality in elderly patients visiting the emergency department. Appropriate workup of hyponatremia at the initial point of contact, can save time and provide important information about the underlying pathology causing hyponatremia, thus ensuring correct management and reduction in morbidity and hospital stay.

### Introduction

Hyponatremia is defined as serum sodium concentration below 135. It is one of the most frequent electrolyte abnormalities in hospitalized elderly patients and also in the community where the incidence is around 8% <sup>1,2</sup>.

Due to the broad range of causative factors, identifying the correct etiology of hyponatremia is often tricky for junior doctors working in the emergency department.

Moreover, appropriate treatment is only possible if all the necessary workup is sent for, at the initial point of contact with the patient and results are interpreted correctly.

Studies have shown that hyponatremia in the elderly population is an independent factor in the overall risk of mortality<sup>3</sup>.

### Case Report

A 77-year-old man was referred by his GP for 3 week's history of fatigue, anorexia, and nausea. On arrival at the emergency department, he was complaining of light-headedness, dizziness, and nausea.

His Vital signs including ECG, blood pressure, and pulse were normal. Routine blood tests were also normal except for serum sodium levels which was 119, serum cortisol level which was 65, TSH of 0.27, and free T4 of 7.5. The patient's past medical history was significant for chronic hyponatremia and hypothyroidism for which he was taking regular thyroxine replacement.

While in the emergency department, the patient had a brief episode of sudden onset limb jerking and eye-rolling which lasted for a few seconds only. A repeat VBG done after that seizure-like episode showed a serum sodium level of 115, thus hypertonic saline was administered, and the patient was also given a stat dose of 200mg hydrocortisone. He was shifted to HDU for further treatment and monitoring. The endocrine team was also involved in his care.

#### Lab Values:

Serum Sodium	115↓ (135-145)	Short Synacthen Test	
results:			
Serum cortisol	65↓ (102-535)	Cortisol at 0 minutes	81
TSH	0.27↓ (0.35- 4.94)	Cortisol at 30 minutes	368
(80-477)			
Free T4	7.5↓ ( 9-19)		
(102-535)			
Random urine Na	89↑		
Serum Osmolality	240 ↓		
Prolactin	786↑ (86-324)		
Luteinizing hormone	1↓ (1.7-8.6)		
FSH	2 (1.5-12.4)		
ACTH	8↓ (7.2 – 63.3)		

## Discussion

This patient had long-standing chronic hyponatremia of around 3 years duration, for which unfortunately no workup was done. Moreover, his thyroid function tests were also deranged for the last 2 years whereby his TSH and free T4 were always low despite taking regular and optimal dosages of thyroxine.

His symptoms of chronic hyponatremia were nonspecific and intermittent and thus he only sought medical advice when they became unbearable and constant.

Keeping in view the chronically low sodium, cortisol, TSH, and T4, a pituitary profile and serum ACTH levels were sent which revealed high prolactin of 786, low normal ACTH of 8 despite low cortisol, and low normal LH. Thus, a short synacthen test was performed which was positive confirming the cause of hyponatremia as adrenal insufficiency, however, the low normal pituitary hormones and low TSH despite thyroxine replacement indicated that the pathology was in the pituitary rather than adrenal glands.

MRI pituitary confirmed a pituitary adenoma measuring 1 cm in diameter (see Image 2). Thus, a final diagnosis of secondary adrenal insufficiency due to nonfunctioning pituitary adenoma was made and the patient was commenced on regular hydrocortisone treatment which normalized his serum sodium levels. The patient was thus discharged and referred to a pituitary specialist where he is being followed up with interval pituitary MRIs.

### Declarations of Conflicts of Interest:

None declared.

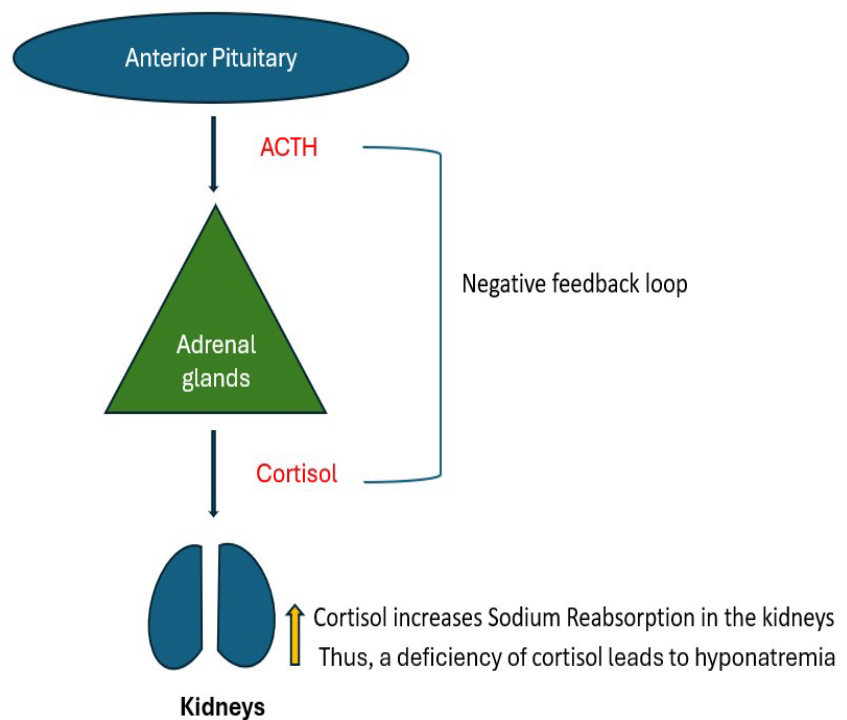
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Arrow pointing towards nonfunctioning pituitary adenoma