Severe hyponatremia and syndrome of inappropriate antidiuretic hormone secretion (SIADH) as a primary presentation of neurosarcoidosis

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Introduction

Sarcoidosis is a multi-system inflammatory disease of unknown etiology characterized by abnormal collection of inflammatory cells termed as granulomas[1]. It is female-predominant condition, and most patients develop respiratory system involvement[2]. This disease usually involves lungs, skin, or lymph nodes, but can less commonly affect the eyes, liver, heart and brain. Neurological involvement is rare and appears in 5-10% of the cases[3]. Most common neuroendocrine manifestation is diabetes insipidus, followed by amenorrhea and galactorrhea. SIADH is rare and hyponatremia is uncommon presentation, but few cases have been reported[4,5]. In this case we describe a rare presentation with symptomatic hyponatremia and SIADH.

Pathophysiology

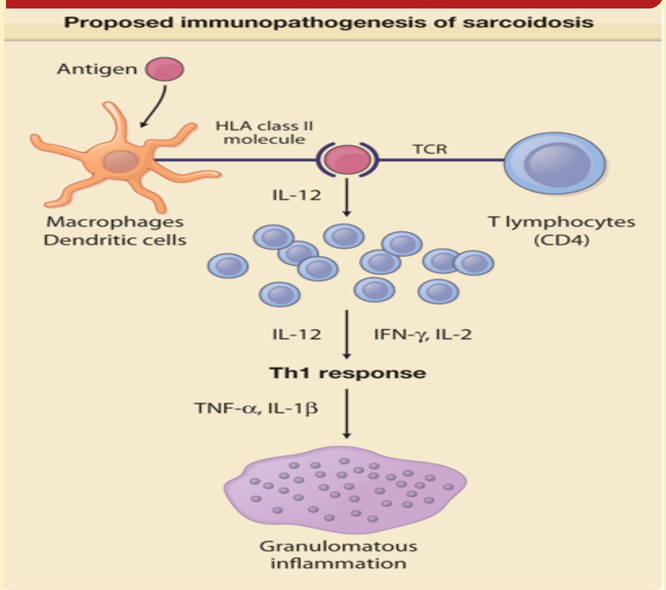


Fig 1. Immunopathogenesis of sarcoidosis
Source: Goldsmith LA, Katz SI, Gilchrest BA, Paller AS, Leffell DJ, Wolff K: Fitzpatrick's Dermatology in General Medicine, 8th Edition: www.accessmedicine.com

Case Report

A 52-year-old male presented with worsening confusion, lethargy and poor sleep. He had multiple presentations with hyponatremia and diagnosed with SIADH likely secondary to the anti-epileptic medicines. He had background history of epilepsy, crohn's disease, hypertension and hemochromatosis.

On examination, there were no focal signs of neurological involvement other than intermittent confusion and difficulty in organizational skills. He was found to have severe hyponatremia (Na 118 mmol/L) with serum hypo-osmolality. Anti-epileptic medications were revised in the context of SIADH. High sodium diet and fluid restriction were advised.

Later, he had computed tomography (CT) of thorax, abdomen and pelvis which revealed mediastinal and hilar lymphadenopathy with normal liver parenchyma. His serum angiotensin converting enzyme (ACE) levels were raised with a value of 99 U/L, however; calcium levels were within normal range. He had mild hyperprolactinemia with slightly low thyroid stimulating hormone (TSH) and estradiol levels. Magnetic resonance imaging (MRI) of his brain revealed features consistent with neurosarcoidosis and endobronchial ultrasound biopsy of mediastinal lymph nodes showed non-caseating granulomas thus confirming the diagnosis of sarcoidosis.

Investigations

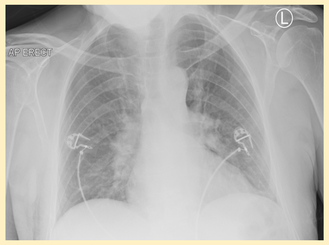


Fig 2. Chest X-ray AP view showing bilateral hilar and mediastinal lymphadenopathy



Fig 3. CT thorax showing bilateral enlarged hilar and mediastinal lymph nodes

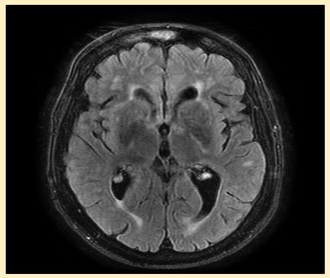


Fig 4. MRI brain shows diffuse multifocal abnormal enhancement in a leptomeningeal and perivascular distribution with a variable nodular and more uniform smooth morphology throughout the brain with particular distribution in the region of circle of Willis.There is involvement of the subcortical and periventricular areas including the carpus callosum. In context of history, the findings are consistent with neurosarcoidosis.

Table 1. Different hormone level assays along with serum ACE and calcium levels.
Note: The abnormal high values are highlighted in red and low values in green.

ACE	99 U/L
Calcium	2.22 mmol/L
Prolactin	750 mIU/L
FSH	5.4 IU/L
LH	4.9 IU/L
ACTH	5.5 pmol/L
Cortisol	337 nmol/L
TSH	0.633 mIU/L
Testosterone	13.6 nmol/L
Oestradiol	36 pmol/L

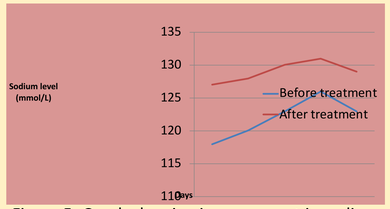


Figure 5. Graph showing improvement in sodium levels after initiating treatment

Treatment

Patient was started on oral steroids, tab prednisolone 1 mg/kg body weight with fluid restriction. His sodium levels started improving with improvement in his clinical symptoms. He was advised follow-up in endocrinology and neurology clinics

Discussion

Sarcoidosis is a chronic inflammatory disorder and involves neurological system in 5-10% cases termed as neurosarcoidosis[6]. It may present with various neurological symptoms including mental state changes. Severe hyponatremia may develop due to hypopituitarism and secondary hypocorticolism. The most common cause of hyponatremia in neurosarcoidosis is SIADH due to the deposition of granulomas in posterior pituitary. In some studies, sarcoidosis has been shown to cause the syndrome of inappropriate ADH secretion, and hence the hyponatraemia[4,5]. Possible endocrine manifestations of sarcoidosis include obesity, body temperature dysregulations, personality change, SIADH, diabetes insipidus (50%), hyperprolactinemia, hypoadrenalism and growth hormone deficiency[7]. Thyroid dysfunction is seen in 4.2–4.6% of cases. In this case the etiology of hyponatremia and SIADH was thought to be neurosarcoidosis and significant improvement was noted after the corticosteroid therapy.

Conclusion

This case report highlights that SIADH presenting with severe hyponatremia can be a primary presentation of neurosarcoidosis. In conclusion, Sarcoidosis should be considered in the differential diagnoses of SIADH and electrolyte imbalance..

Acknowledgments

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