Case Report

Severe Hyponatremia due to Hypopituitarism Secondary to Empty Sella Syndrome

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Author's Contribution

[1,2] Conception of study
[1,3] Experimentation/Study conduction
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Abstract

This case is about a 68 years old patient who presented with worsening generalized weakness, dizziness, low mood, and reduced appetite with a background history of gout and vitamin D deficiency. On general examination, the patient appeared very lethargic. However, the systemic examination was unremarkable. The vitals check showed a low blood pressure of 104/72 mm Hg. The investigations showed low levels of serum Sodium, Thyroid-stimulating hormone, Cortisol. The short Synacthen test was abnormal. The anterior pituitary hormone level showed low levels of Follicle-stimulating hormone, Luteinizing hormone, and prolactin. CT head with contrast showed enlarged fluid-filled pituitary fossa with fat. An MRI Pituitary gland showed an empty sella syndrome. The patient was hydrated initially and electrolytes were monitored regularly. Treated with hydrocortisone and thyroxine to which the patient responded and improved significantly. A follow-up appointment was arranged at the endocrine clinic.

Keywords: Empty Sella Syndrome, Hyponatremia, Hypopituitarism.

Introduction

The pituitary gland is located at the base of the brain[1], regulating the whole body's metabolic system by secreting and controlling various hormones of the body. Unknown etiology, surgery, radiation, and cancer can lead to a condition known as Empty Sella Syndrome (ESS)[2,3], which in turn can lead to hypopituitarism in some patients. ESS is mostly asymptomatic. However, severe hormonal deficiency leads to signs and symptoms of hypopituitarism.

Hyponatremia in hypopituitarism can be due to dehydration secondary to diarrhea and vomiting or hypothyroidism-induced syndrome of inappropriate secretion of antidiuretic hormone (SIADH). Our patient was dehydrated as manifested by physical examination leading to hypovolemic hyponatremia.

Materials and Methods

A 68 years old patient presented to the hospital with generalized weakness, fatigue, lethargy, low mood, and reduced appetite. She denied fever, headache, palpitations, shortness of breath, and diarrhea. She had three attacks of generalized weakness in the past 5 years. The background history includes hyponatraemia, vitamin D deficiency, and gout. She was on vitamin D replacement therapy. General examination revealed low mood and agitation. Systemic examination was unremarkable. The vitals check of the patient showed low blood pressure.

Results

The initial investigations are shown as follow:

Table 1: Initial Investigations

Test	*Result*	*Units*	*Normal Range*
White cell count	5.4	*10^ 9/L	4.0-11.0
Haemoglobin	119	g/l	120-150
C reactive protein	<5	mg/l	<10
Sodium	119 (low)	mmol/l	133-146
Potassium	4.4	mmol/l	3.5-5.3
Creatinine	96 (high)	umol/L	45-84
Albumin	43	g/l	35-50
Calcium	2.40	mmol/l	
Magnesium	0.77	mmol/l	0.70-1.00
Thyroid Stimulating Hormone	1.57 (low)	mIU/L	0.30-4.80
Free T3	3.3 (low)	pmol/L	4.2-6.9
Free T4	3.2 (low)	Pmol/L	7.7-20.6
Iron	7.4	umol/l	11.0-32.0
Ferritin	43	ug/L	11.0-307.0
B-12	174	ng/L	145-914
Cortisol	61	nmol/l	

Based on initial investigations, further tests were advised including the short synacthen test:

Table 2: Further tests

Test	*Result*	*Unit*	*Normal Range*
Urine Sodium	139	mmol/l	
Urine Osmolality	339	mOsm/kg H2O	
Serum Osmolality	258 (low)	mOsm/kg H2O	275-295

Table 3: Short Synacthen test

Test	*Result*	*Unit*	*Normal Range*
ACTH at 09:00	18	ng/L	Up to 50ng/L
30 minute Cortisol	207 (low)	nmol/l	> 450
60 minute Cortisol	256.8 (low)	nmol/l	> 500

Due to abnormal short synacthen test, pituitary hormones were ordered:

Table 4: Pituitary Hormones

Test	*Result*	*Unit*	*Normal Range*
Follicle stimulating hormone	1.9 (low)	I.U./l	>30
Luteinizing hormone	0.3 (low)	I.U./l	>16
Prolactin	45 (low)	mIU/L	58-416
Insulin like growth factor 1 (IGF1)	3.8 (low)	nmol/l	4.8-21.6

Computer Tomography (CT) Pituitary with contrast showed enlarged fluid-filled pituitary fossa with some fat within the fossa.

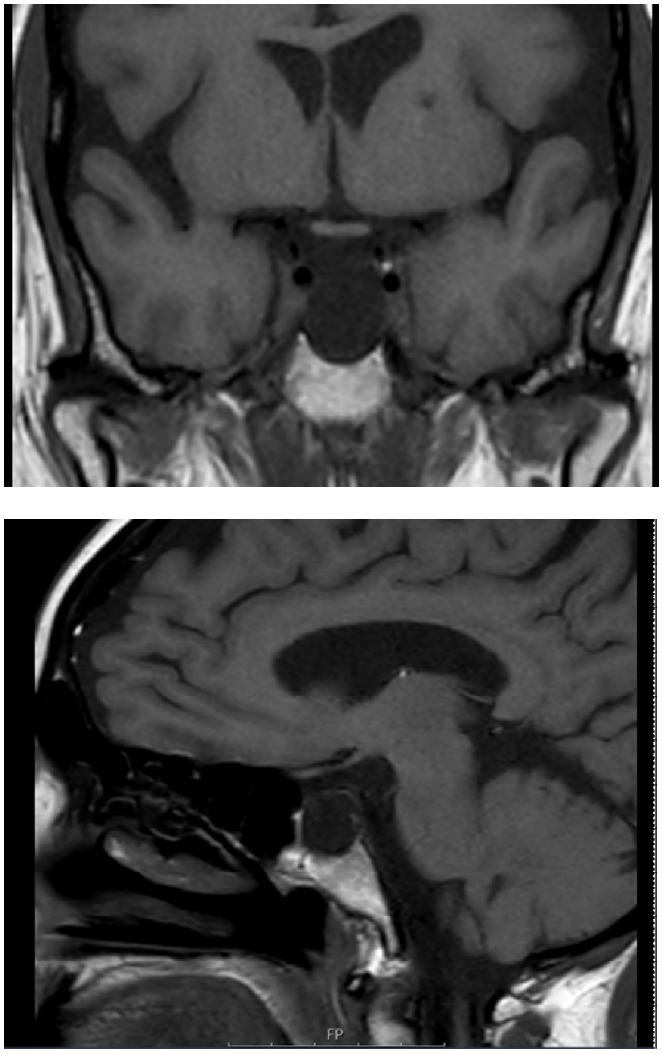

Figure 1: Magnetic Resonance Imaging (MRI) of Pituitary Gland showed Empty sella syndrome

Differential diagnosis:

The history and investigation indicate the possibility of Postural Hypotension, Anaemia, and hyponatraemia in a postmenopausal lady.

Treatment:

Following the abnormal short Synacthen test, she was started on 50mg hydrocortisone TDS. Due to low Blood Pressure, she was hydrated initially with IV fluid but once sodium reached 124, IV fluids were stopped. Thyroxine 50mcg was also added.

Outcome and follow up:

Patient discharged home on Thyroxine 50 mcg and hydrocortisone 10mg am, 5mg pm, and regular follow-up arranged in an endocrine clinic.

Discussion

Empty sella syndrome incidence has been reported in women with high body mass index and high blood pressure.[4] The etiology can be classified into idiopathic and secondary to tumor, brain surgery, trauma, and radiation exposure. The majority of empty sella syndrome cases are asymptomatic. However, if symptomatic, the symptoms vary and depend on the hormones missing.[5]

Hypopituitarism is usually rare and has multiple etiologies. Infectious diseases like tuberculosis, infiltrative diseases like sarcoidosis, cancerous lesions[3], head injuries, radiation treatment of the upper parts of the body, drugs, stroke, and severe blood loss can all lead to low pituitary hormones production.[5] The symptoms depend upon the type of hormonal deficiency. Loss of energy, oligomenorrhea, mood swings, erection problems, weight gain or loss, hypotension, vomiting, abnormal electrolytes, and low breast milk production are commonly identified symptoms.

Multiple cases have been reported about empty sella syndrome.[6] In the majority of these cases, the patients were noted to have different symptoms depending upon the type of pituitary hormone deficiency. Detailed laboratory investigations and imaging revealed empty sella syndrome as a cause of their clinical presentations.[7,8]

Severe hyponatremia as a manifestation of empty sella syndrome is rare. Severe hyponatremia along with low blood pressure and nausea should raise the possibility of abnormality in pituitary hormones. Initially, investigations for adrenal gland hormones should be arranged in such patients. Abnormal results would lead to further tests like the short synacthen test and pituitary profile.[9,10] The cause of low serum sodium in our patient is due to low adrenal hormones. Hypothyroidism-induced SIADH was one of the differentials after initial investigations. However, further investigations ruled out SIADH in our patients.

Conclusion

Empty sella turcica is a radiological finding and mostly asymptomatic, uncommon cases like this would help us gain more insight into this condition.

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