Case Report

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Severe hyponatremia as an atypical manifestation of pituitary macroadenoma: a case report

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Introduction and importance: Pituitary macroadenoma most commonly presents with visual disturbances, headache, and other symptoms secondary to adeno hypophyseal hormonal deficiencies and usually alleviates after tumor resection. Pituitary adenomas may be the cause of the syndrome of inappropriate antidiuretic hormone secretion (SIADH) causing hyponatremia, although so far, there have only been a few documented cases. Here, we present a case of pituitary macroadenoma with SIADH and hyponatremia. This case has been reported in line with CARE (CAse REport) criteria.

Case presentation: We present a case of a 45-year-old woman who presented with symptoms of lethargy, vomiting, altered sensorium, and seizure. Her initial sodium level was 107 mEq/l, plasma and urinary osmolality were 250 and 455 mOsm/kg, respectively, and her urine sodium level was 141 mEq/day, suggestive of hyponatremia due to SIADH. MRI scan of the brain revealed approximately 14 × 13 × 11 mm pituitary mass. Prolactin and cortisol levels were 41.1 ng/ml and 5.65 μg/dl, respectively.

Clinical discussion: Hyponatremia can result from various diseases, making it hard to identify the cause. A pituitary adenoma is a rare cause of hyponatremia due to SIADH.

Conclusion: Pituitary adenoma rarely might be the cause of SIADH presenting as severe hyponatremia. So, in case of hyponatremia due to SIADH, clinicians should keep pituitary adenoma as well in their differential diagnoses.

Keywords: hyponatremia, pituitary adenoma, SIADH

Introduction

Pituitary adenomas are the most common sellar region tumors, accounting for ~10–15% of all intracranial brain tumors[1]. They are called macroadenomas if they are larger than 10 mm and microadenomas if they are smaller than 10 mm. Based on the hormones produced by adenomas, one common classification system divides these lesions into functional and nonfunctional categories. Approximately 70% of adenomas are functional, while 30% are nonfunctional[2]. For accurate tumor localization and assessment of local compressive mass effects, pituitary mass evaluation should include MRI and visual field examination. Hormone hypersecretion should be measured to differentiate nonsecretory from secretory tumors, and pituitary-reserve function should be evaluated[3]. According to epidemiologic research, the incidence and prevalence of pituitary adenomas in the general population are rising (between 3.9 and 7.4 cases per 100 000 per year and 76–116 cases per 100 000 population, respectively) (~1 case per 1000 of the general population)[4].

HIGHLIGHTS

- Pituitary macroadenoma may rarely be the cause of hyponatremia due to a syndrome of inappropriate antidiuretic hormone secretion (SIADH).
- SIADH with hyponatremia in pituitary macroadenoma can be managed conservatively.

Pituitary adenomas are clinically diverse, with women encountering the majority of clinically significant cases[4]. The most frequent varieties of pituitary adenomas are prolactinomas and nonfunctioning adenomas. Pituitary adenomas can manifest clinically in one of three ways: as syndromes of excessive or insufficient hormone secretion; as neurologic manifestations caused by the mass effect of an enlarging gland; or as an accidental finding on imaging performed for another reason[5]. Surgery is the gold standard care for pituitary adenoma patients with severe visual impairment; however, there is limited agreement on how to manage those patients who have very minor or no vision-related symptoms. In visually asymptomatic individuals with radiological indications of optic chiasm compression or tumors approaching the chiasm, surgery has been recommended as a prophylactic treatment[6].

Pituitary adenomas may be the cause of the syndrome of inappropriate antidiuretic hormone secretion (SIADH) presents as severe hyponatremia; however, there have only been few examples recorded

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thus far[7]. Severe hyponatremia is an uncommon presentation of pituitary macroadenoma[8]. We present a case of hyponatremia and SIADH in a patient with pituitary macroadenoma. The work has been reported in CARE (CAse REport) guidelines[9].

Case presentation

A 45-year-old woman presented in our center with a chief complaint of lethargy and episodic vomiting for 3 months, altered sensorium, and seizure for one day. The patient initially felt extremely lethargic and had vomiting episodes roughly in intervals of 15 days for 3 months. She had a brief episode of unconsciousness and then altered sensorium. She experienced two episodes of abnormal body movement half an hour apart, lasting nearly a minute. There was no history of fever, headache, photophobia, phonophobia, vision problems, weight gain, easy bleeding, excessive sweating, heat intolerance, and altered bowel or bladder habits. There were no associated precipitating factors. She was diagnosed with esophagitis and managed on a proton pump inhibitor. She did not give a history of surgery or exposure to toxins/heavy metals. The patient consumes a non-vegetarian diet, does not smoke or consume alcohol, and has regular menstruation. There is no family history of similar complaints.

On admission, her general condition was fair (GCS 13/15). She was well-oriented to time, place, and person. Her vital signs were stable and within normal limits except for high blood pressure (value: 150/110 mmHg). There was no pallor, icterus, lymphadenopathy, edema, cyanosis, or clubbing. Her higher mental functions, cranial nerves, sensation, and coordination were normal. The tone, power, and reflexes of her upper and lower limbs were normal. The rest of the systemic examination findings were regular.

Investigations such as renal function tests (RFTs), MRI scans, liver function tests (LFTs), hormone profile, plasma and urine osmolality, and urine tests were done. Her sodium was 107 mEq/l, urine and plasma osmolality were 455.3 and 250 mOsm/kg, respectively, and her urine sodium level was 141 mEq/day, suggestive of hyponatremia due to SIADH.

Table 1

Laboratory Investigations

Tests	Units	Results	Reference range
Sodium	mEq/l	107	135–146
Potassium	mEq/l	4	3.5–5.2
Urea	mmol/l	3	1.6–7.0
Creatinine	µmol/l	65	40–110
ALT/SGPT	U/l	14	42
AST/SGOT	U/l	19	37
Total bilirubin	µmol/l	16	3–21
Direct bilirubin	µmol/l	5	4
RBS	mmol/l	5.5	3.8–7.8
fT3	pmol/l	3.90	2.4–6.0
fT4	pmol/l	10.74	9.0–19.0
TSH	µIU/ml	2.956	0.35–4.94
Prolactin	ng/ml	41.1	5.71–77
Cortisol	µg/dl	5.65	4.46–22.7
Plasma osmolality	mOsm/kg	250	275–290
Urine osmolality	mOsm/kg	455.3	295–800
Urine sodium	mEq/day	141	43–217

ALT, alanine transaminase; AST, aspartate transaminase; fT3, free triiodothyronine; fT4, free thyroxine; RBS, random blood sugar; SGOT, serum glutamic–oxaloacetic transaminase; SGPT, serum glutamate pyruvate transaminase; TSH, thyroid-stimulating hormone.

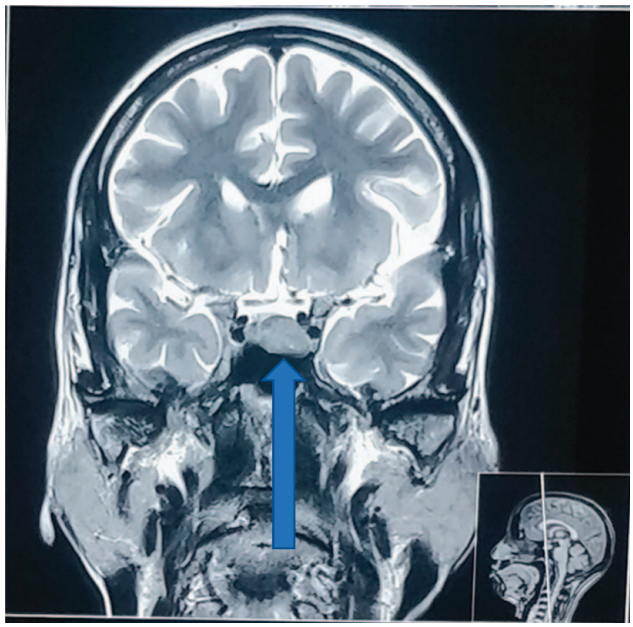

Figure 1. Coronal section of MRI brain showing mass suggestive of pituitary macroadenoma (arrow).

Prolactin was 41.1 ng/ml. Cortisol was 5.65 µg/dl (Table 1).

For assessment of the hypothalamic–pituitary axis, an MRI scan of the brain was done. MRI scan revealed ~14 × 13 × 11 mm sized mass with a convex upward border. The infundibulum had mild right-side displacement with no evidence of compression of the optic chiasma (Figures 1 and 2). For assessment of the effect of pituitary macroadenoma on optic chiasma, ophthalmology Optical Coherence Tomography (OCT) test and Goldman Visual Field (GVF) tests were performed. GVF test revealed normal superior and inferior visual fields. The diagnosis of pituitary macroadenoma with SIADH causing hyponatremia was made.

Hyponatremia was corrected initially, when severe, by slow intravenous administration of sodium chloride IP 3.0% w/v. She was prescribed Tolvaptan and suggested water restriction at the time of discharge. During follow-up, her sodium level was corrected and within normal range. She was referred to the neurosurgery department for pituitary macroadenoma.

Discussion

A pituitary adenoma is one of the most typical tumors. Pituitary adenoma can be macroadenoma or microadenoma based on the diameter of the mass, microadenoma for less than 10 mm, and macroadenoma for greater than 10 mm. Pituitary adenomas can be functional (associated with hormone excess and clinical manifestation) or nonfunctional (without clinical symptoms of hormone excess). The patients with this tumor may have anterior pituitary deficiencies for one or more hormones either due to impedance in the secretion of hypothalamic-releasing hormones or death of adeno hypophyseal cells[10].

Usually, nonfunctioning pituitary macroadenoma presents without any clinically evident symptoms, so in many cases detected incidentally. In some cases, due to mass effect,

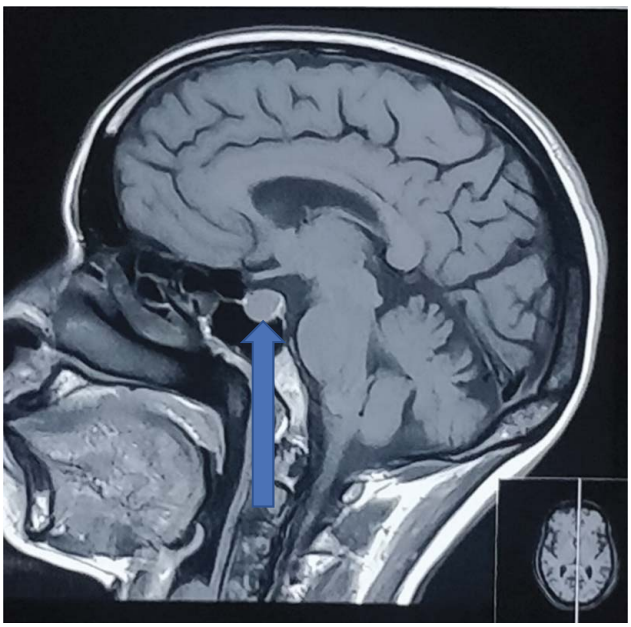

Figure 2. Sagittal section of MRI brain showing tumor in a suprasellar region resembling pituitary macroadenoma (arrow).

nonfunctioning pituitary macroadenoma may present with visual disturbances, headache, and hypopituitarism. The patient can have mild hyperprolactinemia due to interference in descending inhibitory dopaminergic control over adenohypophyses[11]. Pituitary adenomas can cause hyponatremia by SIADH, but this is a rare occurrence with few documented cases[7]. In our case, pituitary macroadenoma presented as severe hyponatremia, cyclical vomiting, altered sensorium, and lethargy.

Investigation such as clinical examination along with hormone profile tests, urinary sodium tests, urine osmolality tests, serum osmolality tests, MRI scan, and ophthalmological assessments (GVF tests) are conducted for diagnosis. Different biochemical analyses are done to classify pituitary adenoma for a personalized treatment approach[12,13]. In this case, hormone profile tests, renal function tests, MRI, ophthalmological assessments, and plasma and urinary osmolality were measured. MRI scan showed $\sim 14 \times 13 \times 11$ mm sized pituitary mass. Her initial sodium level was 107 mEq/l, plasma and urinary osmolality were 250 and 455 mOsm/kg, respectively, and her urine sodium level was 141 mEq/day, suggestive of SIADH. Prolactin and cortisol levels were 41.1 ng/ml and 5.65 µg/dl, respectively. Thyroid-stimulating hormone (TSH) was 2.956 µIU/ml. Hence, here, in this case, pituitary macroadenoma was of nonfunctioning type and was the cause of SIADH presenting as hyponatremia.

Hyponatremia is not an uncommon presentation. There are multiple overlapping differential diagnoses, so etiological diagnosis is a challenging task[12]. In hyponatremia due to SIADH, pituitary adenoma might be the rare cause[7]. Here we present a case of pituitary macroadenoma with an uncommon presentation of SIADH causing severe hyponatremia.

Conclusion

Clinicians should be vigilant and suspicious about the possibility of pituitary adenoma in middle age persons with peculiar characteristics, mainly episodic vomiting, and hyponatremia, which might help in prompt diagnosis and appropriate management of the disease. SIADH with hyponatremia in pituitary macroadenoma can be managed conservatively.

Ethical approval

This is a case report. Therefore, it did not require ethical approval from the ethics committee.

Consent

Written informed consent was obtained from the patient for the publication of this case report. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

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Author contribution

N.P.: involved in counseling and treatment of the patient; A.Y., S.K., and B.K.S.: collected all the required information, reports, and figures; reviewed the literature and contributed to writing and editing the manuscript. All authors read and approved the final manuscript.

Conflicts of interest disclosure

There are no conflicts of interest.

Research registration unique identifying number (UIN)

1. Name of the registry: not applicable.
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