Case Report

Hypopituitarism as a Rare Cause of Hyponatremia

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Abstract: Hypopituitarism is defined as pituitary hormone (or hormones) deficiency caused by dysfunction of pituitary gland and/or hypothalamus. Clinical findings and diagnostic procedure depend to the deficient pituitary hormone. The prognosis of patients with hypopituitarism is associated with presentation, age, the degree and severity of the hormonal disorder, and the response to medical and surgical treatment. In present case, we report a 78 years old woman that presented with hyponatremia, nausea and vomiting, whom consequently diagnosed with hypopituitarism and we discussed diagnostic procedure to establish the diagnosis. In sake of prevention of mortality, physicians should be aware of hypopituitarism in subjects with nausea, vomiting and electrolyte disturbances. Once the diagnosis established, replacement therapy should be initiated immediately.

Keywords: Hypopituitarism, Hyponatremia, Nausea, Vomiting, Mortality, Hormone, Treatment.

INTRODUCTION

Hypopituitarism is defined as pituitary hormone (or hormones) deficiency caused by dysfunction of pituitary gland and/or hypothalamus. It is associated with reduced quality of life and even with increased morbidity and mortality [1]. Hypopituitarism is usually occur in the course of pituitary adenomas and after brain trauma, yet, it is a very rare clinical condition. The first step in diagnosis is considering the condition since it could have variety of symptoms according to the dysfunction of various hormones. The signs and symptoms of the disease are consequences of the deficient hormone and the degree of deficiency. Immediate hormone replacement therapy, surgery or radiotherapy are treatment options of the disease [2].

Here we present an elderly patient presented with nausea, vomiting and with moderate hyponatremia whom consequently diagnosed with hypopituitarism.

CASE REPORT

A 78-year-old female patient was admitted to the internal medicine outpatient clinic with complaints of nausea, vomiting and anorexia. Her symptoms have been persisted for last 4 months and have been worsen since two weeks. She had an admission to another hospital with same symptoms one and a half month ago and had been hospitalized and treated for hyponatremia for a couple days. The patient were not using any medications.

Her general condition was good, she was well appeared, conscious and oriented. Vital signs were as follows: blood pressure was 120mmHg systolic and 75mmHg diastolic, respiratory rate was 18 per minute, heart rate was 84 per minute and body temperature was 36 celcius degree. Respiratory sounds were normal on oscultation without any crackles or rhonchi. Heart rhythm was regular with normal S1 and S2 sounds. No additional heart sounds nor murmur were notable. Abdominal examination revealed normal signs without any abnormal findings. Other physical examination findings were unremarkable.

The patient was admitted to the internal medicine clinic for further evaluation. Laboratory findings were as follows: serum sodium (Na) was 116 meq/L, plasma glucose was 66 mg/dl. Other biochemical parameters were in normal range. Her plasma osmolality was calculated as 237 mosmol/kg and glomerular filtration rate was calculated as 85mL/minute/1.73m2. Body water of the patient was considered as euvolemic and therefore, euvolemic hyponatremia causes were observed. Spot urine sodium was 76 mmol/L. Anterior pituitary hormones, thyroid hormones and serum cortisol levels were studied. Follicle stimulating hormone (FSH) was 1.45 IU/L (normal range:3.03-8.08 IU/L), Luteinizing hormone (LH) was 0.62 IU/L(normal range for postmenopausal women: 5.2-62 IU/L), Prolactin was 22 mcg/L (normal range: 5.2-26.5 mg/L), serum cortisol at 8 o'clock in the morning was 4.9 mcg/dL, adrenocorticotropic hormone (ACTH) was 10 pg/mL (normal range: 0-46pg/mL), growth hormone (GH) was 1 ng/mL (reference range for women: 0.1-7 ng/mL), thyroid stimulating hormone (TSH) was 4.93 mU/L (normal range: 0.27-4.2mU/L), free T4 was 0.56 ng/dL (normal range: 0.7-1.48 ng/dL) and free T3 was 1.88 ng/dL (normal range: 1.71-3.71 ng/dL). Hypoglycemia at night noticed during hospital stay of the patient which responded well to intravenous infusion of 10% dextrose solution. These findings arise the suspicion of pituitary deficiency, therefore, magnetic resonance imaging study of pituitary gland performed. The magnetic resonance imaging was reported empty sella. Treatment of intravenous methylprednisolone 20 mg three times a day initiated. Levothyroxine

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25mcg/day added 3 days after initiation of corticosteroid therapy. Sodium and glucose levels in blood tests were normalized during the clinical course with these treatments. After gradual decrease of the dosage of methyl prednisolone, it was switched to oral prednisolone 5mg three times a day. Her symptoms vanished with treatment and she was discharged from hospital with full recovery.

DISCUSSION

Hypopituitarism is defined as pituitary hormone (or hormones) deficiency caused by dysfunction of pituitary gland and/or hypothalamus. It is associated with reduced quality of life and even with increased morbidity and mortality [1]. Pituitary adenomas and trauma are two main causes of hypopituitarism despite it is a rare condition in general population [1]. Proper endocrinological tests that are specific to deficient hormone are essential in the diagnosis of the disease. Surgery, radiotherapy and mostly hormone replacement are treatment options of the disease [1]. The signs and symptoms of the disease are consequences of the deficient hormone and the degree of deficiency. Symptoms of the patients in present case were include nausea, vomiting and hyponatremia in serum biochemistry. Moreover, patients with hypopituitarism due to a sellar mass may also have mass-related symptoms such as headache, loss of vision, or diplopia. However, present case did not suffer from such symptoms.

One of the most important presenting clinical feature of hypopituitarism is hyponatremia [3]. In a case series, 72% of the subjects with hypopituitarism were suffered from hyponatremia [4]. The rates of mild and moderate hyponatremia in hypopituitarism are both 24% in a report by Miljic *et al*. [3]. Elderly subjects with hypopituitarism are more prone to develop hyponatremia compared to younger patients [5]. The patient presented in this report was an elderly, 78 year old women.

Nausea is another presenting symptom of hypopituitarism [3]. Infections, heart failure and vomiting are reported as common causes of hyponatremia in the course of hypopituitarism [3]. Similarly, the patient presented had nausea and vomiting as predisposing factors to hyponatremia.

Damage to the anterior pituitary may occur suddenly or slowly, may be mild or severe, and may affect the secretion of one, several, or all pituitary hormones. In fact, clinical presentation of anterior pituitary hormone deficiencies vary depending on various factors. The subject presented symptoms mainly due to cortisol insufficiency. However, her FSH and LH levels were also decreased.

The affection rate of anterior pituitary cells is an important factor related to the clinical features of hypopituitarism. Certain diseases, such as pituitary apoplexy, develop rapidly, leading to a sudden deterioration of ACTH secretion and, consequently, to the onset of symptoms of cortisol deficiency. Other causes, such as radiation therapy to the pituitary or hypothalamic region, usually cause a slow decrease in pituitary hormones and became symptomatic within months or even years. There was no relevant trauma, infection in her history nor adenoma in pituitary magnetic resonance imaging which could describe the underlying cause of hypopituitarism in present case.

Severity of hormone deficiency is another definitive factor for clinical spectrum of hypopituitarism. Complete ACTH and cortisol deficiency can cause severe symptoms, while partial deficiency can only cause symptoms during increased physiological stress. Mild to moderate symptoms in present case suggest that the hypopituitarism was developed in a long course.

The number of deficient pituitary hormones is another important predictor of clinical signs and symptoms in patients with hypopituitarism. One, or more or all pituitary hormone secretions could be defective in hypopituitarism. Growth hormone and gonadotropins are more likely to be affected by pituitary damage compared ACTH and thyroid stimulating hormone. However, there are many exceptions in this manner, so that, some cases could be characterized with deficiency in only ACTH secretion. Hypopituitarism was consist of low levels of cortisol and gonadotropins in present case.

The deficiency of ACTH is defined as secondary adrenal insufficiency and cause reduced cortisol levels in serum. Since cortisol is essential for maintenance of vascular tone, severe cortisol deficiency may cause mortality by vascular collapse. Hypotension and tachycardia are features of less severe cortisol deficiency. Mild and chronic cortisol deficiency may result in tenderness, fatigue, anorexia, weight loss, decreased libido, hypoglycemia and eosinophilia. Hyperpigmentation may occur in primary but not in secondary adrenal insufficiency. Similarly, since aldosterone secretion is not impaired, hyperkalemia, hypovolemia and salt loss are not common in secondary adrenal insufficiency [6]. The present case had hypoglycemia and hyponatremia due to reduced serum cortisol levels.

Common symptoms of TSH deficiency are fatigue, cold intolerance, decreased appetite, constipation, facial bloating, dry skin, bradycardia, delayed relaxation phase of anterior tendon reflexes and anemia. The degree of symptoms and signs associated with the severity of thyroxin deficiency. However, some patients with severely reduced TSH might be asymptomatic. TSH was not reduced, in contrary slightly increased in present case.

Reduction of FSH and LH results in hypogonadotropic hypogonadism (secondary hypogonadism) in both women and men [7]. Since the patient in present case was an elderly postmenopausal women, specific treatment was not required for hypogonadism.

Growth hormone deficiency in children typically shows short statue. However, clinical signs of growth hormone deficiency in adults include changes in body composition (decreased lean body mass and increased fat mass), decreased body mass index and increased rate of mortality [8, 9]. GH level of the present patient was in normal range.

The only known clinical manifestation of prolactin deficiency is insufficiency of postnatal lactate. Isolated prolactin deficiency is rare. There is evidence that other pituitary hormone deficiencies are present in most of the patients with acquired prolactin deficiency [10]. Prolactin levels were normal in present case.

The subjects with symptoms and signs of electrolyte disturbance, hypotension and hypoglycemia should be evaluated for pituitary insufficiency [11]. Thyroid hormone replacement may lead to Addison's crisis in patients with hypopituitarism, therefore, cortisol deficiency should be treated initially with sufficient glucocorticoids [12]. The patient present was treated with methyl prednisolone initially before thyroxin replacement.

CONCLUSION

In conclusion, patients with hyponatremia who present with nausea and vomiting, and hypoglycemia hypopituitarism should be kept in mind as differential diagnosis. It is important to initiate the appropriate treatment timely after the diagnosis of hypopituitarism is established.

CONFLICT OF INTEREST

Declared none.

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