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CASE REPORT

An Inappropriate ADH Syndrome and Lung Cancer Diagnosis in A Patient with Isolated Hyponatremia

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Abstract
Hyponatremia is generally considered to have a plasma sodium concentration less than 135 mEq / L. It is the most common electrolyte abnormality which is important in clinical practice. It can be caused by many etiological factors. Inappropriate antidiuretic hormone syndrome (SIADH) is the one of the causes of normovolemic hyponatremia. On the other hand, SIADH is responsible for 30% of hyponatremias due to cancer. It appears as a paraneoplastic syndrome especially and most offen in the lung carcinoma. The World Health Organization (WHO) reported that lung cancer is 12.9% of all cancers. It may manifest itself with specific symptoms, but may also show only the paraneplastic syndrome. Therefore, it should be kept in mind that the cause of hyponatremia must be determined and may be a symptom of SIADH and lung cancer.
Key words: Hyponatremia, inappropriate antidiuretic hormone syndrome, lung cancer

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Introduction

The main determinant of serum osmolality is the serum sodium concentration. The main factor that causes symptoms and clinical findings in hyponatremia is the decrease in serum osmolality (Adrogué and Madias, 2000). It is called hyponatremia when the serum sodium concentration is below 135 mmol / L. Hyponatremia is the most common electrolyte abnormality, which is important in clinical practice (Upadhyay et al., 2006). The hyponatremes are divided into three groups according to the patient's volume status:

(i) hypovolemic hyponatremia,
(ii) normovolemic hyponatremia, and
(iii) hypervolemic hyponatremia.

This approach has great importance both in the recognition and in the determination of the treatment. Hyponatremic hypovolemia is caused by renal and extrarenal volume losses, whereas hypervolemic hyponatremia is caused by heart failure, cirrhosis, nephrotic syndrome and renal failure. Hypothyroidism, glucocorticoid insufficiency, primer polydipsia, stress (physical or

emotional), medications and inappropriate antidiuretic hormone syndrome (SIADH) can be considered as the causes of normovolemic hyponatremia. Among them, the SIADH has a special importance in terms of its finding as a paraneoplastic syndrome (Ellison and Berl, 2007). The most common malignancy which is seen togehter is the lung cancer.

In this case of a hyponatremia presentation which is frequently seen in elderly patients and frequently emergency recourse done, we aimed to raise awareness on the SIADH detection and lung cancer diagnosis.

Case

A 72-year-old male patient without known systemic disease and drug use was admitted with complaints of emergency fatigue, nausea, vomiting, and impaired balance during walking. He stated that his complaints started by 10 days and increased by the last 5 days. Vital findings and physical examination findings were normal. His laboratory values were glucose 141 mgr/dl, BUN 25 mgr/dl, cre 0,81 mgr/dl, AST 14, ALT 17, Na 111 mEq/l, K 3,5 mEq/l, Ca 8,9 mgr/dl, Hb 11,9 gr/dl, Htc % 34,2, WBC 4900, Plt 184000, CRP 2,5. In the arterial blood gas PH: 7,45, PO2 66,6 mmHG, PCO2 32,1 mmHg, HCO3: 22,1 mEq/l were detected. The patient was hospitalized, initially hydrated and requested routine examinations. The Na level of the patient followed up with 3% NaCl infusions increased to 113, 129 and 134 mEq / lt in 3 days. Liver, kidney, thyroid function tests, ferritin, folate, vitamin B12 levels, lipid parameters were normal, sedimentation was 5 mm / h and HA1c was % 6.7. The urine was normal. There was no characteristic on chest X-ray. Plasma cortisol level 22.09 microgr / dl, ACTH level 29 pgr / dl, Aldosterone level 3.7 ngr /dl were in the normal limits. Abdomen USG was normal, thyroid USG was reported as multinodular goiter. In addition, abdomen and pituitary and brain MRI did not detect any lesion covering the space. The capillary glucose was followed and regulated by diet. No medication was started. He is discharged with hydration and one week after and polyclinic control proposal. The Na level was found 104 mEq / l when the patient came to control after 1 week of walking and talking with impaired, weakness and nausea. He was hospitalized again. Upon of the attenuation of the severe hyponatremia in the short term, despite the recent hydration and hypertonic fluid replacements, without dehydration, use of any medication but with the weight loss; Na excretion was calculated in 24 hours by sighing the inappropriate ADH syndrome. The 24-hour urine volume was 3580 mL, and the urinary Na excretion was 465 mmol / day, which was significantly higher. Plasma osmolality was determined 224 mOsm / kg, as low. As a result of inappropriate ADH syndrome, paraneoplastic syndrome and lung cancer were suspected. On this, patient was taken for the thorax CT. In the right lung central incision, a solid, space-occupying lesion was observed at the intermediate bronchus level with a lobulated contour extending in the middle and lower lobe and measuring 25x36 mm in its widest area. It is noted that a large consolidation area including air bronchograms in the right lung sub-lobe laterobasal segment distal to the mass, and a bronchovascular demarcation, tubular bronchial structures and mild icy plaques are associated with it. In the mediastinal region, ovoid lymph nodes were observed with the largest in prevascular area with 16x8 mm size.

The patient underwent bronchoscopy with the diagnosis of Lung Ca (Figure 1). Pathologic diagnosis was defined as small cell lung carcinoma.

Figure 1. The mass completely covering the bronchial area.

Discussion

Although the definition of hyponatremia varies in different clinical laboratories, it is generally considered to be less than 135 mEq / L. Serum osmolarity should be calculated in the patient with hyponatremia and determined exactly. Symptoms of hyponatremia depend on the degree of hyponatremia and the rate of development. Symptoms are usually seen in the acute hyponatremia and primarily concerns the central nervous system. These symptoms are due to developing brain edema. Here, the migration of extracellular water into the cell due to the resulting hypoosmolality becouse of the depletion of serum sodium concentration plays a role. When the serum sodium concentration falls slowly, the brain cells give off electrolytes and organic acids to the extracellular space with adaptation purpose, thus reducing the risk of brain edema. Symptoms of hyponatremia include nausea, vomiting, muscle cramps, agitation, lethargy, and apathy. Hyponatremia findings include decreased tendon reflexes, hypothermia, pathological reflexes, Cheyne-Stokes respiration, impaired consciousness, and convulsions (Sterns, 2015).

SIADH is the most common cause of normovolemic hyponatremia. Here, the urinary osmolarity is above 100 mOsm / kg and the urine sodium concentration is usually above 40 mEq / L (Anderson et al.,1985). In order to diagnose SIADH, the patient should have normal heart, liver, kidney, adrenal, thyroid and pituitary functions and should not use diuretics. Some criteria have been defined that allow the identification of SIADH.

- The presence of normovolaemic hyponatremia
- Plasma osmolality <275 mOsm / kg
- Urinary osmolality> 100 mOsm / kg
- Urine sodium> 40 mEq / L
- Acid-base and potassium balance are normal
- Hypoüricemia (uric acid <4 mg / dL)
- Adrenal and thyroid functions are normal
- No renal, hepatic, cardiac disease
- Diuretics are not used

SIADH is seen in about 7% among the causes of hyponatremia in hospitalized patients (Reddy and Mooradian, 2009). It is known that it can be a paraneoplastic syndrome mostly due to lung cancer. SIADH is responsible for 30% of hyponatremias due to cancer (Sorenson et al.,1995). Small cell lung carcinoma is the leading of these (Kalemkerian et al., 2013).

Lung cancer is the most common malignancy worldwide and the leading cause of cancer-related deaths. The World Health Organization (WHO) reported that lung cancer in 2012 brought a total of 1.8 million new cases with 12.9% of all cancers (Ferlay et al., 2015). According to the Ministry of Health's 2012 data in our country, it is the most comman cancer type in men and the fifth in women, and it is estimated that about 30,000 new cases are diagnosed each year (Turkish Thoracic Society, 2013).

This case was not different from the common hyponatremia in daily emergency cases. For the first consult in the emergency departement, the patient was elderly and weak and it was appeared to have a low oral intake and dehydration which are the most frequent cause of hyponatremia in the etiology. On the other hand, the patient did not have any of the cough, sputum, fever, sweating, dyspnea complaints. Again, the anamnesis lasted 10 days and did not indicate a significant weight loss. There was no pathologic mass appearance on chest X-ray. However, despite all of this, the absence of a hyponatremia-revealing hypo and hypervolaemia during examinations and follow-ups, the absence of a systemic illness necessitated the consideration of normovolaemic hyponatremia and SIADH. The patient's intense reappearance of hyponatermic at 1 week after the treatment strengthened the suspicion. Thereupon the mass in the lung was detected with thorax tomography.

Conclusion

Hyponatremia should be considered in terms of SIADH, especially in normovolemic situations, although it is the most common electrolyte disorder that develops for many reasons. With keeping in mind that the lung cancer is the most common in worldwide, and its increase in recent years, a paraneoplastic syndrome and lung carcinoma should be remembered in these cases.

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