



Small Cell Lung Cancer Presenting as Hyponatremia: A Case Report

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Table with 2 columns: Keywords (hyponatremia, SIADH, lung, small cell carcinoma) and Abstract (Background - Euvolemic hyponatremia caused by hypothyroidism, drugs, stress, glucocorticoid deficiency and syndrome of inappropriate antidiuretic hormone secretion(SIADH)(1,2,3,4). SIADH is the most frequent cause of euvolemic hyponatremia (1,4). [Continued...] © 2018 Journal of Nephrology and Renal Transplantation. All rights reserved)

1. Introduction

Euvolemic hyponatremia caused by hypothyroidism, drugs, stress, glucocorticoid deficiency and syndrome of inappropriate antidiuretic hormone secretion(SIADH). SIADH is the most frequent cause of euvolemic hyponatremia. Common causes of SIADH include pulmonary disease (e.g. pneumonia, tuberculosis, pleural effusion),and central nervous system(CNS) diseases(e.g. tumor, subarachnoid hemorrhage, meningitis).SIADH also occurs with malignancies, most commonly with small-cell lung carcinoma(1,2,3,4).

Table with 2 columns: [Abstract Continued...] and A 45 years old man presented with persistent nausea, vomiting and epigastric pain in emergency department. Primary assessment defined normotension, elevated amylase and lipase more than 3-fold the upper limit of normal, and severe hyponatremia. He admitted in general ward with diagnosis of pancreatitis. We approach to euvolemic hyponatremia and detected hypouricemia, normal TSH and normal serum cortisol (8AM). Because of history of smoking and suspicion of SIADH we requested CXR.

Right upper lobe collapse (Golden S-sign) was seen on chest radiograph. Further evaluation including chest CT scan and abdomino-pelvic sonography demonstrated mass in right para tracheal region, some lymph nodes in anterior mediastinum, some pulmonary nodules in left lower lobe (LLL) and multiple hypoechoic lesion in liver.

Liver biopsy was performed. Immuno histo chemistry revealed metastatic small cell carcinoma of the lung.

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### **Case report:**

A previously healthy 45 years old smoker man presented with persistent nausea, vomiting and epigastric pain to emergency department. His pain radiated into the back and his appetite was decreased and he had 9kg weight loss over 2 weeks.

His vital signs were stable (BP=120/80mmhg, HR=80beats/min, T=37). And physical exam was normal.

Primary assessment defined elevated amylase and lipase more than 3-fold the upper limit of normal, and severe hyponatremia (Na=110meq/L).

Except ALT=125IU/L, AST=78IU/L; the other laboratory tests were normal.

He admitted in general ward with diagnosis of pancreatitis.

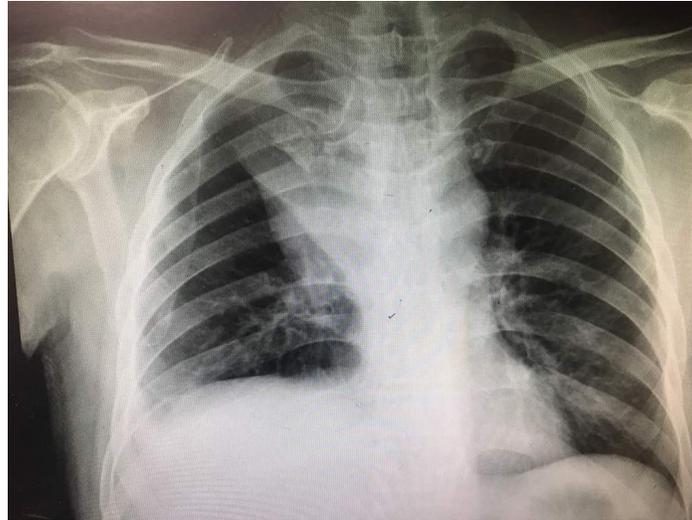
We started intravenous rehydration with Ringer's lactate (2litres/day) and patient was made NPO to rest the pancreas and was given intravenous narcotic analgesics to control abdominal pain (5).

We approached to euvolemic hyponatremia and detected hypouricemia, normal TSH, and normal serum cortisol (8AM).

We restricted fluid to 1litre/day after 2days and Na improved to 124meq/L 3days after fluid restriction.

Because of history of smoking and suspicion of SIADH, we requested CXR.

Right upper lobe collapse (Golden S-sign) (figure 1) was seen on chest radiograph.



**Figure (1)**

Further evaluation including chest CT scan and abdomino-pelvic sonography demonstrated mass in right para tracheal region, some lymph nodes in anterior mediastinum, some pulmonary nodules in LLL and multiple hypoechoic lesion in liver.

Liver biopsy was performed. Immuno-histo chemistry revealed metastatic small cell carcinoma of the lung.

Finally patient referred to oncologist for treatment.

## **2. Discussion**

Euvolemic hyponatremia can occur in moderate to severe hypothyroidism.

Severe euvolemic hyponatremia can also be a consequence of secondary adrenal insufficiency due to pituitary disease. Glucocorticoids have a negative feedback on AVP release by the posterior pituitary (1,4).

The syndrome of inappropriate antidiuretic hormone secretion (SIADH) is the most frequent cause of euvolemic hyponatremia (2,4).

Common causes of SIADH include pulmonary disease (e.g. pneumonia, tuberculosis, pleural effusion) and central nervous system (CNS) diseases (e.g. tumor, subarachnoid hemorrhage, meningitis). SIADH also occurs with malignancies, most commonly with small-cell lung carcinoma.

SIADH is also a frequent complication of certain drugs, most commonly the selective serotonin reuptake inhibitors (SSRIs) (4).

Clinical assessment of hyponatremia should focus on the underlying cause.

A careful clinical assessment of volume status is obligatory for the classical diagnostic approach to hyponatremia (3,4).

In the setting of suspicion of euvolemic hyponatremia, laboratory investigation should include measurement of serum uric acid, thyroid function tests (if clinically indicated), adrenal and pituitary function tests (if clinically indicated). (Figure 2)

**Major causes of hyponatremia**

Disorders in which ADH levels are elevated
Reduced effective arterial blood volume
True volume depletion
Heart failure
Cirrhosis
Syndrome of inappropriate ADH secretion, including reset osmostat pattern
Hormonal changes
Adrenal insufficiency
Hypothyroidism
Pregnancy
Disorders in which ADH levels may be appropriately suppressed
Advanced renal failure
Primary polydipsia
Beer drinker's potomania
Hyponatremia with normal or elevated plasma osmolality
High plasma osmolality (effective osmols)
Hyperglycemia
Mannitol
High plasma osmolality (ineffective osmols)
Renal failure
Alcohol intoxication with an elevated serum alcohol concentration
Normal plasma osmolality
Pseudo hyponatremia (laboratory artifact)
High triglycerides
Cholestatic and obstructive jaundice (lipoprotein-X)
Multiple myeloma
Absorption of irrigant solutions
Glycine
Sorbitol
Mannitol

ADH: antidiuretic hormone.  
Graphic 77603 Version 7.0

**Figure (2)**

Serum uric acid is often low (<4mg/dl) in patients with SIADH (1,4).

Radiologic imaging may also be appropriate to assess whether patients have a pulmonary or CNS cause for hyponatremia (4).

A screening chest-x-ray may fail to detect a small-cell carcinoma of the lung; CT scanning of the thorax should be considered in patients at high risk for this tumor (e.g. patients with a smoking history) (4).

The syndrome of inappropriate antidiuretic hormone secretion (SIADH) is frequently caused by SCLC and results in hyponatremia. Approximately 10 percent of patients who have SCLC exhibit SIADH. (6,7) SCLC accounts for approximately 75 percent of all malignancy-related of SIADH.

The severity of symptoms is related to the degree of hyponatremia and the rapidity of the fall in serum sodium. Symptoms include anorexia, nausea, and vomiting. Cerebral edema can occur when the onset of hyponatremia is rapid.

The treatment of SIADH focuses on treating the malignancy. In the majority of patients with SCLC, the hyponatremia will resolve within weeks of starting chemotherapy. Chronic hyponatremia or that of unclear duration may be treated with normal saline infusion to euvolemia, fluid restriction and demeclocycline, or a vasopressin-receptor antagonist. Acute and severe hyponatremia may be carefully treated with hypertonic (3 percent) saline infusion for a correction of 1 to 2 mmol per liter per hour with a correction of not more than 8 to 10 mmol per liter in 24 hours.(8)

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