

Case report

Syndrome of inappropriate secretion of ADH in the course of chemotherapy for anaplastic large T-cell lymphoma of the lung

Grzegorz Kade¹, Maciej Michalak^{2,3}, Aleksandra Straszyńska⁴, Dariusz Moczulski⁵, Janusz Hałka⁶, Sebastian Spaleniak⁵

¹ Warmian-Masurian Cancer Center of the Ministry of the Interior and Administration's Hospital, Olsztyn, Poland

² Diagnostic Imaging Department, Warmian-Masurian Cancer Center of the Ministry of the Interior and Administration's Hospital, Olsztyn, Poland

³ Department of Radiology, University of Warmia and Mazury, Olsztyn, Poland

⁴ Student of the Faculty of Medicine, Medical University of Lodz, Poland

⁵ Department of Internal Medicine and Nephrodiabetology, Medical University of Lodz, Poland

⁶ Department of Clinical Hematology, Warmian-Masurian Cancer Center of the Ministry of the Interior and Administration's Hospital in Olsztyn, Poland

Correspondence:

Sebastian Spaleniak

Department of Internal Medicine and
Nephrodiabetology, Medical University of Lodz
90-549 Łódź, Poland, ul. Żeromskiego 113
phone: +48 695 134 368
e-mail: sebastian19860@op.pl

Received:

25.06.2022

Accepted:

30.06.2022

ABSTRACT

The present study reports the case of a 40-year-old patient who presented SIADH syndrome due to anaplastic large T-cell lymphoma and antineoplastic drugs.

Key words: SIADH, hyponatremia, lymphoma, antineoplastic drugs

DOI: 10.24292/01.OR.122300622

Copyright © Medical Education.

All rights reserved.

CASE REPORT

A 40-year-old patient with anaplastic large cell lymphoma (diagnosis based on a core biopsy of lung tumor) was admitted to the Hematology Department for the second course of chemotherapy. The first Hyper-CVAD chemotherapy course (cyclophosphamide, doxorubicin, dexamethasone, vincristine) with additional intrathecal methotrexate and cytosine arabinoside had been administered one month previously.

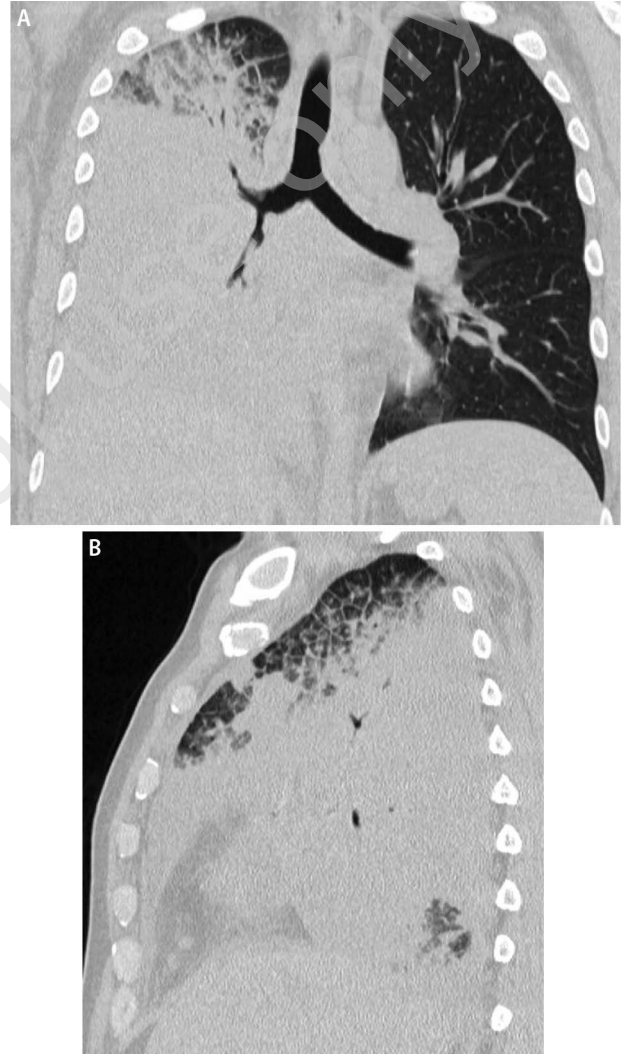
On history taking, the patient maintained full logical verbal contact. The patient was significantly weak and complained of chest wall pain. Therefore, additional tests were performed which showed (reference ranges in brackets): sodium – 116 mmol/l (135–145 mmol/l), potassium – 3.9 mmol/l (3.5–5.0 mmol/l), magnesium – 2.21 mg/dL (1.7–2.5 mg/dl), ionized calcium – 1.021 (1.12–1.32), phosphorus – 1.88 mg/dl (2.7–4.5 mg/dl), creatinine – 0.54 mg/dl (0.7–1.2 mg/dl), urea – 13 mg/dl (16.6–48.5 mg/dl), uric acid – 1.8 mg/dl (3.4–7.0 mg/dl), 25-(OHD) – 3 ng/dl (0–10 ng/dl means severe deficiency), serum osmolality 246 mOsm/kg H₂O (285–295 mOsm/kg H₂O), urine osmolality 663 mOsm/kg H₂O (700–1200 mOsm/kg H₂O). Urinalysis was normal. Sodium concentration in a urine sample was 35 mmol/l.

On physical examination, no features of overhydration or dehydration were found, and blood pressure values were normal. The diagnostics was expanded to include high-resolution computed tomography (HRCT) which revealed a unilateral extensive mass-like consolidation which invaded almost the entire right lung. The nodular thickening of the walls of the lobar bronchi and mild lymphadenopathy were observed. Pleural effusion was not observed (fig. 1A, B).

Further diagnosis of hyponatremia included the following additional laboratory tests (reference ranges in brackets): morning cortisol – 6.79 µg/dl (6.02–18.4 µg/dl), cortisol at 4 p.m. – 3.01 (2.68–10.5 µg/dl), ACTH in the morning – 31.4 pg/ml (10–60 pg/ml), TSH – 0.27 uIU/ml (0.27–4.2 uIU/ml), fT₃ – 3.1 pmol/l (3.1–6.8 pmol/l), fT₄ – 19.24 pmol/l (12–22 pmol/l). We excluded adrenocortical insufficiency, thyroid dysfunction and pseudohyponatremia in the course of hyperglycemia, paraproteinemia and hypertriglyceridemia [1]. Renal phosphate loss was ruled out due to concomitant hypophosphatemia. In order to expand the diagnosis of pulmonary lesions, a bronchoscopy was performed. It confirmed the progression of anaplastic T-cell lung lymphoma. Based on biochemical criteria and the clinical picture, Syndrome of Inappropriate Antidiuretic Hormone Secretion (SIADH) was diagnosed. Its etiology was complex including T-cell lymphoma and the use of antineoplastic drugs. The dominant etiological

Figure 1A, B.

HRCT scans, the lung window reconstructed in the coronal and sagittal views. In the right lung, an extensive mass-like consolidation invading almost the entire lung is visible. Nodular thickening of the walls of the lobar bronchi.



factor of SIADH syndrome was not indicated [1]. Based on the Naranjo algorithm, it was determined that SIADH was probably induced by drugs [2].

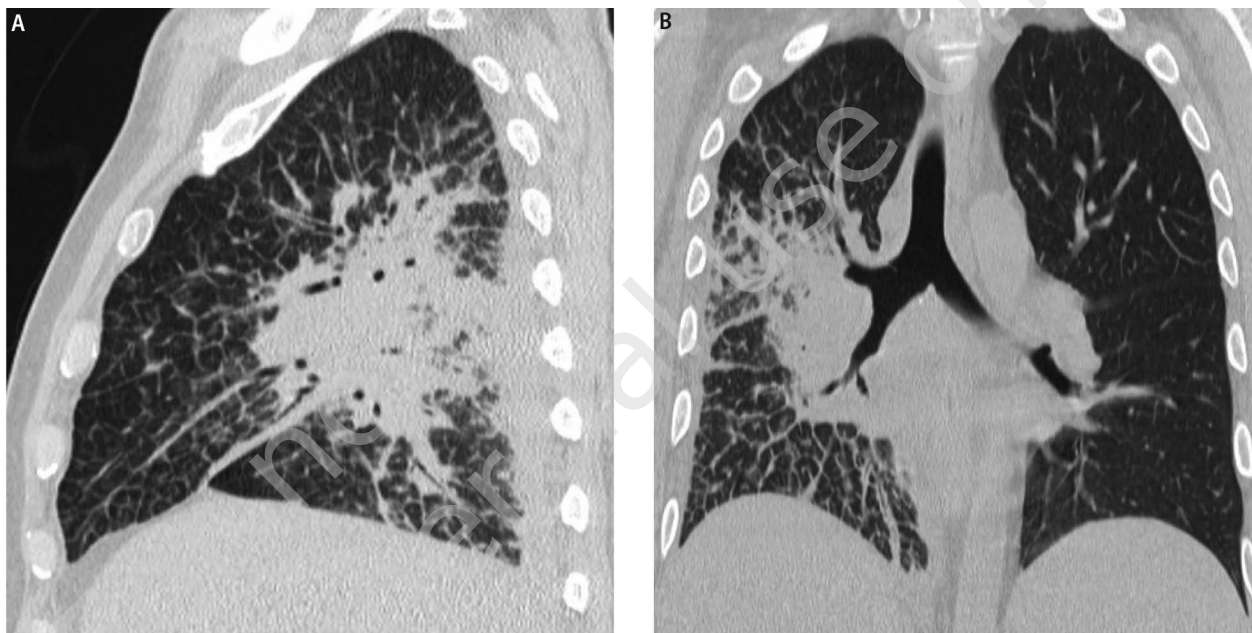
Due to mild symptoms of hyponatremia, fluid restriction and infusion of 150 ml of 3% NaCl were introduced in the patient, resulting in an increase in natremia to 132–135 mmol/l. Significant improvement in the clinical status was observed after natremia normalization, and a decision was made to administer the second course of chemotherapy. 12 days after the course, a follow-up HRCT was performed, showing the regression of pulmonary lesions. We observed a perihilar consolidative lesion distributed along the bronchovascular bundles with the inva-

sion of interlobular septal thickening and smooth outlines of the walls of the lobar bronchi. The size of the lymph nodes decreased (fig. 2A, B). Natriemia remained within normal limits.

regardless of the underlying disease, might induce SIADH by increasing the activity of ADH in the renal tubules and by stimulating the secretion of ADH [3, 5].

Figure 2A, B.

Follow-up HRCT scans performed after 12 days. A reduced perihilar consolidative lesion distributed along the bronchovascular bundles with the invasion of interlobular fissures. Smooth outlines of the walls of the lobar bronchi.



DISCUSSION

Small cell lung cancer, characterized by the excessive production of ADH, is the most common neoplastic cause of SIADH [1]. Pulmonary lymphomas rarely contribute to the development of SIADH. SIADH is caused by drugs more commonly than by neoplasms [3, 4]. In our patient, cyclophosphamide and vincristine,

Notably, the symptoms of hyponatremia in the course of SIADH are often poorly expressed, and its occurrence in the course of a neoplastic disease is associated with an increased risk of mortality [1, 6, 7].

References

1. Castillo JJ, Vincent M, Justice E. Diagnosis and management of hyponatremia in cancer patients. *Oncologist*. 2012; 17(6): 756-65.
2. Naranjo CA, Busto U, Sellers EM et al. A method for estimating the probability of adverse drug reactions. *Clin Pharmacol Ther*. 1981; 30(2): 239-45.
3. Shepshelovich D, Schechter A, Calvarysky B et al. Medication-induced SIADH: distribution and characterization according to medication class. *Br J Clin Pharmacol*. 2017; 83(8): 1801-7.
4. Nishiwaki U, Hirata Y, Yokote T et al. Syndrome of inappropriate antidiuretic hormone secretion associated with adult T-cell leukaemia/lymphoma. *Br J Haematol*. 2014; 166: 155.
5. Harlow PJ, DeClerck YA, Shore NA et al. A fatal case of inappropriate ADH secretion induced by cyclophosphamide therapy. *Cancer*. 1979; 44: 896-8.
6. Winiarska K, Taborek M, Czerwienka B et al. Difficulties in the diagnostics of chronic hyponatremia based on the case study of a 66-year old female patient during antihypertensive therapy. *Pol Merkur Lekarski*. 2021; 292: 303-5.
7. Matuszkiewicz-Rowińska J, Mieczkowski M. Nefrotoksyczność leków stosowanych w chemioterapii nowotworów. *OncoReview*. 2012; 2(5): 29-38.

For non-commercial use only

Authors' contributions:

Grzegorz Kade: 20%; Sebastian Spaleniak: 20%; Janusz Hałka: 20%;
Dariusz Moczulski: 15%; Maciej Michalak: 20%;
Aleksandra Straszyńska: 5%.

Acknowledgments:

None.

Conflict of interests:

None declared.

Financial support:

None.

Ethics:

The authors had full access to the data and take full responsibility for its integrity.

All authors have read and agreed with the content of the manuscript as written.

The paper complies with the Helsinki Declaration, EU Directives and harmonized requirements for biomedical journals.