Clinical Case Study

Severe Hyponatremia with High Urine Sodium and Osmolality

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CASE DESCRIPTION

A 49-year-old woman (previous history of childhood asthma, no medication) presented to the emergency department with nausea and vomiting that had occurred for 5 days and slurred speech for 1 day prior to presentation. The patient denied use of alcohol and illicit drugs. Physical examination revealed her blood pressure to be 125/70 mmHg; she had no postural drop and had a regular pulse of 72 beats/min. She had no fever and no signs of contracted extracellular fluid volume. Results of further physical and neurological examination were unremarkable and revealed no goiter, pigmentation, or vitiligo. Her laboratory results are shown in Table 1. Additional diagnostic tests included chest x-ray, abdominal ultrasound, and brain computed tomography, none of which revealed abnormalities. The syndrome of inappropriate antidiuretic hormone secretion (SIADH) was suspected. However, fluid restriction (500 mL/day) did not lead to increased serum sodium.

Table 1. Laboratory results.

	Parameter	Patient	Reference
Serum	Sodium, mmol/L	101	135–145
	Potassium, mmol/L	4.0	3.5–5.0
	Osmolality, mOsm/kg	209	280–300
	Glucose, mmol/L[a]	3.5	4.0–7.6
	Calcium, mmol/L	2.19	2.20–2.65
	Creatinine, μmol/L	69	75–110
	Urea, mmol/L	2.9	2.5–6.4
	Uric acid, mmol/L	0.19	0.20–0.42
	Hemoglobin, mmol/L	8.8	7.5–9.5
	Albumin, g/L	42	35–50
Urine	Sodium, mmol/L	95	—[b]
	Osmolality, mOsm/kg	812	50–1200

[a] To convert nanomoles per liter of glucose to milligrams per deciliter, multiply by 18.
[b] There are no reference interval values for urine sodium, because measured values depend on the diet and the clinial circumstances. During hyponatremia, high or low urine sodium concentrations (typically with 20 mmol/L as cutoff) can be used for differential diagnosis.

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Questions to Consider
1. What is the differential diagnosis in a patient with severe hyponatremia and a high urine sodium and osmolality?
2. Name three hormones that, when disturbed, can all independently result in hyponatremia with a high urine sodium and osmolality?
3. What should be excluded before the diagnosis?

Final Publication and Comments

The final published version with discussion and comments from the experts will appear in the November 2009 issue of *Clinical Chemistry*. To view the case and comments online, go to http://www.clinchem.org/content/vol55/issue11 and follow the link to the Clinical Case Study and Commentaries.

Educational Centers

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