

# Recurrent hyponatremia due to tolterodine

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A 65-year-old woman came to the endocrinology clinic of our hospital with fatigue, muscle weakness and urinary incontinence. She has had these complaints for five months and was hospitalized at the neurology department and diagnosed with hyponatremia, urge incontinence, hypertension, diabetes mellitus and cerebrovascular disease. Her history included hospitalization for recurrent hyponatremia two times in the last five months; she could not walk due to muscle weakness. Her medications were tolterodine (six months), metformin, amlodipin and insulin aspart 30% and aspart protamin 70% (for three years). On admission, her blood pressure was 130/80 mmHg, pulse rate 80/min and neurological examination revealed left hemiparesis. Laboratory analyses are listed in Table 1.

Ejection fraction was 60% by echocardiography. After 2 liters of saline infusion, her blood sodium level was 126 mmol/L. After discontinuing tolterodine the serum sodium levels returned to normal in a few days.

Hyponatremia is a common and important electrolyte abnormality in hospitalized patients causing a wide range of neurological symptoms. The differential diagnosis of hyponatremia is mandatory since there is a risk of neurological sequelae during the treatment. Tolterodine-associated hyponatremia is especially seen in the elderly; our case is the fourth case of tolterodine-associated hyponatremia.<sup>1,4,5</sup> Drug-induced syndrome of inappropriate antidiuretic hormone secretion (ADH) can occur due to an increase in ADH production centrally or an increased sensitivity to ADH in the nephron.<sup>3,5</sup> Tolterodine (Detrol, Detrusitol) is an antimuscarinic used to treat urinary incontinence. Tolterodine might induce hyponatremia by either increasing the ADH secretion or ADH action.<sup>4</sup> Laboratory findings in diagnosis of syndrome of inappropriate ADH include:<sup>3</sup> (1) hyponatremia <135 mEq/L and  $P_{Osm}$  <270 mOsm/kg; (2) urine sodium concentration >20 mEq/L; (3) normal serum creatinine; (4) low uric acid; and (5) normal adrenal and thyroid function.

Our findings were consistent with syndrome of inappropriate ADH; when we stopped tolterodine, serum sodium levels returned to normal.

Urinary incontinence is a common and distressing complaint in the elderly.<sup>2</sup> In this report, we wanted to draw attention to a very rare adverse event caused by tolterodine, a drug mostly prescribed for the elderly.

Competing interests: None declared.

This paper has been peer-reviewed.

**Table 1. Laboratory analyses**

Fasting blood glucose	158 mg/dL
Creatinin	0.6 mg/dL
Blood urea nitrogen	8.7 mg/dL (range: 5-25)
Sodium	123.7 mmol/L
Potassium	4.2 mmol/L
Chloride	98 mmol/L
HbA1c	7%
Total cholesterol	145 mg/dL
Triglycerides	196 mg/dL
Uric acid	2.0 mg/dL (range: 2.6-7.6)
Total protein	6.7 g/dL
Albumin	3.7 g/dL
Total calcium	9.9 mg/dl
Thyroid stimulating hormone	0.55 µIU/mL (range 0.34-5.60)
Free thyroxine	0.82 ng/dl (range 0.61-1.12)
Blood cortisol	17.99 µg/dl (range 6.7-22.6)
Urinary sodium	30.2 mmol/L
Urinary density	1010
fractionated sodium excretion	1.09%
C-reactive protein	0.624 mg/dL
white cell count	11.3×10 <sup>3</sup> /µL
hemoglobin	11.4 g/dL
sedimentation rate	26 mm/h

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