Severe Hyponatremia in a Patient Treated with Levomepromazine and Carbamazepine

A 40-year-old man was brought to hospital because of grand mal seizures in July, 2000. Seven hours before admission, he vomited once and drank approximately 6 liters of water within two hours because of throat discomfort. Thirty minutes later, he suffered six grand mal seizures. His medical history included cerebral palsy at the age of one year complicated with mental retardation and absence epilepsy. He was treated with haloperidol 6.5 mg, biperiden 9 mg, phenytoin 300 mg, clonazepam 3 mg, levomepromazine 185 mg, and carbamazepine 500 mg daily. History of primary polydipsia was not evident. On physical examination, the patient was unresponsive with blood pressure 118/70 mmHg, pulse rate 92/min, and temperature of 37.5°C. Skin turgor was normal. Gingival hyperplasia probably induced by phenytoin was noted. There were no focal neurological signs. Laboratory parameters included leukocyte count 14,600/μl, serum sodium 98 mEq/*l*, potassium 3.6 mEq/*l*, blood urea nitrogen 21.0 mg/dl, creatinine 0.76 mg/dl, and osmolality 213 mOsm/kg of water. Urinary sodium concentration and osmolality were 47 mEq/*l* and 398 mOsm/kg of water, respectively. Serum free thyroxine was 1.11 ng/dl (0.82–1.59 ng/dl), free tri-iodothyronine 3.05 pg/ml (3.14–4.93 pg/ml), and thyroid-stimulating hormone 0.186 mIU/*l* (0.430–3.940 mIU/*l*). Serum cortisol was 30.1 μg/dl (2.7–15.5 μg/dl). Serum sodium concentration measured at a psychiatric hospital two months earlier was 135 mEq/*l*. Computed tomography of the head showed no abnormality. Hypotonic hyponatremia with concentrated urine caused by drug-induced syndrome of inappropriate antidiuretic hormone secretion (SIADH), vomiting, and massive water intake was diagnosed (1, 2). We intended to increase the serum sodium concentration by 12 mEq/*l* over the next 24 hours. The patient was treated with 20 mg of furosemide and 3% of sodium chloride intravenously. After admission, four grand mal seizures were noted. Ten hours after admission, serum sodium increased to 102 mEq/*l*. There were no further seizures. Sixteen hours after admission, serum sodium rose to 107 mEq/*l*. Intravenous 3% of sodium chloride administration was changed to 0.9% of sodium chloride. Thirty hours after admission, serum sodium increased to 117 mEq/*l* and the patient responded to simple commands. He recovered without further neurological deficit.

Several drugs including levomepromazine and carbamazepine can cause SIADH (2, 3). Kimelman and Albert reported (3) that nursing home residents taking phenothiazines had a significantly lower level of serum sodium than the remaining residents. In the present case, it is likely that intake of levomepromazine and carbamazepine, vomiting, and massive water intake caused severe hyponatremia. However, the interaction of levomepromazine and carbamazepine coadministration on antidiuretic hormone secretion in our case is unclear. A search of the MEDLINE database for reports published from 1965 to 2000 showed no case reports of hyponatremia associated with phenothiazines and carbamazepine coadministration. We should be aware that severe hyponatremia may develop in patients treated with drugs which can induce SIADH when further impairment of renal water excretion or excessive water intake occurs concomitantly. Detailed information of the drug history is essential for diagnosis and treatment in patients with electrolyte disorders.

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