Psychogenic Polydipsia-Associated Water Intoxication: A Case Report

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Abstract
Psychological polydipsia can be seen in up to 20% of the patients with psychiatric disorders. Polydipsia can result in hyponatremia, defined as water intoxication that can be fatal. Headache, nausea, seizure, and convulsions may be observed in water intoxication cases. We report a case of a 28-year-old patient with schizophrenia and encephalopathy who developed hyponatremia. The patient had hyponatremia, seizures, and cerebral edema due to water intoxication. The patient was treated intensively and discharged from the internal medicine service on day 3.

Keywords: Hyponatremia; polydipsia; water intoxication.
in the hotel room where the patient was lying unconscious in bed before she was brought to our hospital.

Central venous pressure level was found to be 15 cm H₂O. Some of the patient’s parameters were as follows: arterial blood gas, pH 7.18; PCO₂, 41 mm Hg; PO₂, 94 mm Hg; SpO₂, 99%; HCO₃⁻, 15 mmol/L; and base excess, −13 mmol/L and Acute Physiologic Assessment and Chronic Health Evaluation II score, 14 points. Hypertonic 3% saline therapy was initiated when serum sodium value was 107 mmol/L, and the presence of cerebral edema accompanied by seizures was evaluated as encephalopathy developing as a result of polydipsia in consideration of the specific patient history.

Hypertonic saline administration was terminated when her serum sodium level increased >120 mmol/L. We ensured that the plasma sodium level increased at a rate of <0.5 mEq/L/h. At 13h, she regained consciousness and spontaneous respiration, and her hemodynamic state was stabilized. Then, the patient was extubated and monitored under oxygen delivery with a mask. On day 3 of ICU stay, the patient had a sodium value of 135 mmol/L, and the presence of cerebral edema accompanied by seizures was evaluated as encephalopathy developing as a result of polydipsia in consideration of the specific patient history.

Polydipsia is water intake of ≥3 L/day [3]. Water intoxication may result in muscle cramps, headache, confusion, lethargy, delirium, seizures, and coma. Brain edema and coma may lead to a fatal course. Encephalopathy and neurological symptoms begin when the plasma sodium concentration decreases acutely to <125 mmol/L [8].

Researchers suggested that polydipsia is caused by anticholinergic side effects of the psychiatric drugs used by the patient, whereas other researchers thought that psychotic exacerbations may be correlated with polydipsia [9].

Water intake and ADH release after feeling thirsty are controlled by the medial temporal lobe of the brain. Elevation of ADH levels is known to cause psychotic exacerbations in patients with schizophrenia [10]. The limitation of this case presentation was that we did not examine the ADH levels of our patient in the clinical follow-up.

The lateral hypothalamus is a thirst center, and dopamine is an important neurotransmitter in this area. In animal studies, dopaminergic activity has been shown to be associated with polydipsia [11].

The evaluation and treatment of polydipsic hyponatremia is very difficult, and chronic patients generally may not adapt to fluid restriction [3]. The use of antipsychotics in the treatment of polydipsia is also debatable because they both improve and cause polydipsia [12].

We examined previous studies on water intoxication and related development of encephalopathy in patients with schizophrenia. Rao et al. (2011) [5] reported that they treated these cases with water restriction and low dose risperidone. Their patient was receiving 8 L of water every day. Similarly, Dirican et al. (2005) [8] treated a patient with mental retardation and atypical psychosis with water restriction. Fluid restriction is often sufficient in the treatment of water intoxication. However, it is recommended that hypertonic saline solution should be administered in emergency cases.

Ventricular arrhythmia developed in a case of water intoxication in the study by Bayır et al. (2012) [13] that did not occur in our case.

We should keep polydipsia in mind in psychiatric diseases. Hyponatremia due to polydipsia can lead to fatal outcomes. Careful treatment of hyponatremia is important.

**Conclusion**

In psychiatric disorders, psychological polydipsia, which means that a large amount of water is consumed in a short time due to schizophrenia in particular, is frequently seen, and this can lead to hyponatremic encephalopathy, which is sometimes a risk of morbidity and mortality. This entity that may lead to headache, nausea, vomiting, cerebral edema, encephalopathy, seizures, and even death requires close follow-up and vigorous treatment based on clinical and biochemical parameters.

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