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Osmotic demyelination syndrome following correction of hyponatremia

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Abstract

The treatment of hyponatremia is controversial: some authorities have cautioned that rapid correction causes central pontine myelinolysis, and others warn that severe hyponatremia has a high mortality rate unless it is corrected rapidly. Eight patients treated over a five-year period at our two institutions had a neurologic syndrome with clinical or pathological findings typical of central pontine myelinolysis, which developed after the patients presented with severe hyponatremia. Each patient's condition worsened after relatively rapid correction of hyponatremia (greater than 12 mmol of sodium per liter per day)—a phenomenon that we have called the osmotic demyelination syndrome. Five of the patients were treated at one hospital, and accounted for all the neurologic complications recorded among 60 patients with serum sodium concentrations below 116 mmol per liter; no patient in whom the sodium level was raised by less than 12 mmol per liter per day had any neurologic sequelae. Reviewing published reports on patients with very severe hyponatremia (serum sodium less than 106 mmol per liter) revealed that neurologic sequelae were associated with correction of hyponatremia by more than 12 mmol per liter per day; when correction proceeded more slowly, patients had uneventful recoveries. We suggest that the osmotic demyelination syndrome is a preventable complication of overly rapid correction of chronic hyponatremia.

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