

CASE REPORT



Acute neuroborreliosis presenting with severe hyponatremia: a case report

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ABSTRACT

A 79-year-old Caucasian woman was admitted to the hospital with a 1-week history of general deterioration, describing malaise, abdominal pain, vomiting and diarrhea. Concomitantly, she presented with urinary retention. Laboratory tests revealed severe hyponatremia secondary to the syndrome of inappropriate antidiuretic hormone secretion (SIADH). Patient reported a tick bite 1 month earlier, followed by erythema migrans. The diagnosis of Lyme disease was immediately suspected and confirmed by positive IgM and IgG serology. Symptoms and electrolyte disturbances completely resolved with a 2-week course of doxycycline. This case highlights the need to consider osis as a cause of hyponatremia and SIADH in an endemic region.

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1. Introduction

Lyme disease is classically characterized by three categories of symptoms: dermatologic, rheumatologic and neurologic. Electrolyte disturbances are unusual but possible. We herein report a case of neuroborreliosis with severe hyponatremia and autonomic dysfunction treated successfully with doxycycline.

2. Case report

A 79-year-old Caucasian woman presented to the hospital with a 1-week history of general deterioration, abdominal pain, vomiting, and diarrhea. Further questioning revealed cramps in the calf muscles over the past week, as well as anorexia and dysuria. Her general practitioner removed a tick from her left knee 1 month ago, which was followed by the gradual appearance of erythema migrans. This rash had disappeared upon admission. The patient was euvoletic on physical examination.

Blood tests revealed a C-reactive protein of 12.4 mg/L (normal: <5 mg/L), urea of 13 mg/dL (normal: 24–60 mg/dL), plasma sodium of 114 mmol/L (normal: 135–145 mmol/L), and plasma osmolality of 247 mOsm/L (normal: 280–300 mOsm/L). Urine sodium was 85 mmol/L and urine osmolality was 346 mOsm/L. Renal function, liver biochemistry, morning cortisol, and thyroid function results were within the normal range. Urine and blood cultures were negative. Enzyme-linked immunosorbent assay (ELISA) for Lyme disease antibodies was positive, with Lyme IgG > 240 UA/mL (normal: <10) and Lyme

IgM = 6 UA/mL (normal: <0.9). Subsequent Western blot analysis confirmed the presence of antibodies to Lyme disease antigens.

Cerebral magnetic resonance imaging revealed widespread chronic vascular encephalopathy, and thoracoabdominal computed tomography was unremarkable. During her hospitalization, the patient developed suprapubic pain, and bladder ultrasound showed urinary retention, with a post-void residual volume of >500 mL. This was thought to represent autonomic neuropathy.

The patient was diagnosed with a syndrome of antidiuretic hormone secretion (SIADH) secondary to acute neuroborreliosis, and treatment with doxycycline 200 mg once per day was initiated. No specific treatment for SIADH was administered. Her clinical and biological status progressively improved, and the patient was discharged from the hospital after 6 days of treatment. When reassessed at the end of a 2-week course of doxycycline, the patient was feeling well, and her plasma sodium was 137 mmol/L.

3. Discussion

Severe hyponatremia is a serious condition associated with substantial neurologic complications and mortality [1]. SIADH was immediately suspected in our patient because of her severe hyponatremia and plasma hypo-osmolality in the setting of an inappropriately concentrated urine and elevated urine Na (>20 mEq/L) [2]. In the absence of a pulmonary disorder, damage to the central nervous system was

suspected as the etiology of the SIADH. The recent tick bite followed by erythema migrans led us to suspect neuroborreliosis [3], a diagnosis confirmed by serology testing, which was positive for both Lyme IgM and IgG.

Neurologic manifestations occur in up to 12% of Lyme borreliosis infections, especially in the early phase [4]. A few cases of SIADH have been reported, often associated with neurologic and/or digestive symptoms [5–9]. The first two cases were described by Shamin et al. and accompanied by constipation, urinary retention, and muscle weakness [5]. Among other cases, Siddiqui et al. described an 83-year-old patient presenting with only proximal muscle weakness [7]. These authors stressed the importance of Lyme disease testing in patients with unexplained SIADH who live in endemic areas.

In our patient, we quickly initiated treatment with doxycycline. Doxycycline remains a first-line treatment for Lyme disease, including early neuroborreliosis. Its efficacy was confirmed by a Norwegian study [10] showing that it was non-inferior to ceftriaxone. A distinct advantage of doxycycline is its low cost.

Perhaps, the strongest evidence that this patient had acute neuroborreliosis was her definite response to antibiotic therapy, with complete resolution within 2 weeks of initiating treatment. She was fortunate to have a history suggestive of Lyme disease, which allowed her to promptly receive effective, inexpensive treatment.

4. Conclusion

This case report highlights the possibility of Lyme disease presenting with severe electrolyte disturbances from SIADH, as well as autonomic neuropathy. The history of a tick bite and erythema migrans and the results of serologic tests helped establish the diagnosis. Oral doxycycline treatment was very effective, producing complete resolution of neuroborreliosis.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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