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Urea Treatment of Syndrome of Inappropriate Antidiuretic Hormone Secretion Secondary to Amyotrophic Lateral Sclerosis

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ABSTRACT

Amyotrophic lateral sclerosis (ALS) rarely presents with hyponatraemia caused by syndrome of inappropriate antidiuretic hormone secretion (SIADH). We present a patient with hyponatraemia of multifactorial aetiology, in whom, after withdrawal of the drugs that contributed to this ionic alteration, SIADH secondary to ALS was confirmed. After initiating treatment with urea, sodium levels were normalized.

LEARNING POINTS

- Amyotrophic lateral sclerosis (ALS) is rarely associated with syndrome of inappropriate antidiuretic hormone secretion (SIADH).
- In a patient with chronic hyponatraemia due to SIADH, administration of urea, as recommended by clinical practice guidelines, increases sodium levels.
- We present the case of a patient with SIADH due to ALS where hyponatraemia was resolved using urea.

KEYWORDS

Amyotrophic lateral sclerosis, hyponatraemia, syndrome of inappropriate antidiuretic hormone secretion, urea

CASE DESCRIPTION

An 83-year-old male with a history of type 2 diabetes mellitus, high blood pressure and dyslipidemia was diagnosed with amyotrophic lateral sclerosis (ALS) by our neurology service, with dysarthria as the main manifestation, and treatment with riluzole was initiated. Functional tests showed a moderate restrictive pattern, although without respiratory symptoms.

Three months later, the patient was admitted to the internal medicine service due to a deterioration in his general condition in the previous week, nausea with isolated vomiting, decreased food intake and postural instability. He was taking gliclazide, metformin, irbesartan/hydrochlorothiazide, nifedipine, simvastatin, riluzole, omeprazole, escitalopram and lorazepam. There were no respiratory symptoms and baseline oxygen saturation was 93%. The physical examination showed only a widespread loss of strength, which had appeared in the previous 2 months. In the initial analysis, sodium levels of 120 mmol/l (confirmation with sodium levels of 117) and plasma osmolality of 232 mOsm/kg (normal values 280–300) were the most notable findings.

After discontinuing the thiazide and the 2 drugs associated with syndrome of inappropriate antidiuretic hormone secretion (SIADH), escitalopram and omeprazole, sodium levels were 127 mmol/l and osmolality was 263 mOsm/kg; potassium, venous blood gas, cortisol and TSH were normal, and urine sodium was 46 mmol/l with an osmolality of 560 mOsm/kg, confirming the diagnosis of SIADH. The study of other possible causes of SIADH was negative, including chest x-ray, cranial CT and chest-abdominal CT.

With the withdrawal of the drugs involved in hyponatraemia and fluid restriction, the symptoms that had appeared in the week before admission remitted. At discharge, the patient began treatment with a daily sachet of 15 g of urea and in the follow-up visit at 7 days, sodium levels had normalized to 136 mmol/l.

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DISCUSSION

ALS rarely presents with hyponatraemia, and when it does so, this is due to SIADH[1–3]. It has been suggested that restrictive respiratory failure secondary to respiratory muscle atrophy may be responsible for SIADH in these patients[1]. In reported cases, hyponatraemia was resolved with mechanical ventilation[1], non-invasive ventilation[2] or tolvaptan[3]. The administration of urea for SIADH has not been previously described.

In patients with SIADH, urea administration increases the urinary excretion of solutes and water, significantly raising sodium levels; it may be used chronically, and therefore, despite the lack of placebo-controlled clinical trials, its use is recommended by European clinical practice guidelines on hyponatremia[4], which do not advise the use of vaptans, although controversy remains regarding this point[5]. Urea has not been widely used as it was not available in pharmacies. However, it is currently sold in several countries in sachets containing 15 g of urea in powder form for oral solution with administration every 12–24 hours, and has the advantage that tolerance is better than that for tolvaptan [4], which is why it was decided to use it in this patient.

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