Severe Hyponatremia and Hypopituitarism

A.		Mora ^a
R.		Enríquez ^b
J.		Lacueva ^b
E.	E	Bonilla ^a
E.		González ^a
R.		Llobregat ^b

^aServicio de Medicina Interna y ^bSección de Nefrología, Hospital General y Universitario de Elche, España

Dra. Antonia Mora, Calle Alicante, 51, E-03140 Guardamar del Segura, Alicante (Spain)

Dear Sir,

Hyponatremia is a complication of untreated hypopituitarism and has been associated with an inappropriately high secretion of antidiuretic hormone (ADH). Usually it is not severe and rarely becomes a major symptomatic problem [1]. We describe a patient with severe hyponatremia as the presenting feature of hypopituitarism.

A 50-year-old woman was admitted to hospital for deterioration of her level of consciousness. She had started a week before with flu-like syndrome. Past history: prolonged delivery with profuse blood loss, requiring multiple packed red cell transfusions, 26 years before. Physical examination: blood pressure 100/60 mm Hg, temperature 36.8 °C, lethargy, well hydrated, without peripheral edema or decreased skin turgor. There was also mildly hoarse voice, absence of axillary and pubic hair and nipple hypo-pigmentation. The heart and lungs were normal. The abdomen and extremities were without pathological findings.

Outstanding laboratory test: glucose 2.6 mmol/l, urea

1.05 mmol/l, creatinine 63 µmol/l, uric acid 353 µmol/l, sodium 102 mmol/l, potassium 3.6 mmol/l, chloride 71 mmol/l, bicarbonate 16.3 mmol/l, serum osmolality 196 mosm/kg.

Urine: sodium 41 mmol/l, potassium 61.4 mmol/l, osmolality 552 mosm/kg. Electrocardiography and X-ray film of the chest were normal.

The hormonal profile showed: ADH 1.5 pg/ml (serum osmolality: 196 mosm/kg), cortisol at 8 h 2 µg/dl (normal value, NV, 6-90), cortisol at 20 h 2.3 µg/dl (NV 2-8), adrenocorticotropin 9.8 pg/ml (NV 9-52), triiodothyronine 0.7 ng/ml (NV 0.8-2), thyroxine 3.5 µg/dl (NV 5-11.8), thyroid-stimulating hormone 1.9 µIU/ml (NV 0.3-3.8), estrogens 13.6 pg/ml (NV 68-253), progesterone less than 0.3 ng/ml (NV 2-24), follicle-stimulating hormone 16.5 mIU/ml (NV 1.3-11), luteinizing hormone 5.5 mIU/ml (NV 0.4-19), prolactin 4.5 ng/ml (NV 2-20).

Stimulation test with 200 µg of thyrotropin-releasing hormone: basal level of thyroid-stimulating hormone 1.9 µIU/ml, at 20 min 2.5 µIU/ml, at 30 min 3.3 µIU/ml, at 60 min 2.8 µIU/ml (NV 0.3-3.8).

Cranial, including the sella turcica, and thoracic-abdominal CT scans were without alterations.

Upon arrival, treatment was started with 3% hypertonic saline at a rhythm of no more than 0.5 mmol/l/h, achieving a sodium level of 130 mmol/l.

During the study, water was restricted and sodium chloride intake was maintained, but 1 week after arrival the patient again developed a hyponatremia of 103 mmol/l, the sodium level was corrected gradually and treatment started with hydrocortisone and later with thyroid hormones. In subsequent examinations, the sodium level remained normal, and new clinical symptoms have not appeared.

This patient presented a severe hyponatremia with normal extracellular volume and was initially diagnosed as having inadequate secretion of ADH syndrome (SIADH). However, the clinical data suggested the existence of pituitary insufficiency that was later confirmed by an appropriate test. Her hypopituitarism was probably due to postpartum pituitary infarction (Sheehan's syndrome).

The hydrocortisone therapy resolved the hyponatremia in a long-lasting manner, while the infusion of hypertonic saline was less effective, as has been reported in other cases of hypopituitarism [1, 2]. Hypopituitarism is recognized as a cause of hyponatremia, and it has been related to ADH hypersecretion [1, 2]. However, the plasma ADH level has been documented in only a few published cases. We determined in our patient the plasmatic ADH, and it was excessively high for the serum osmolality. Clinical and experimental studies have suggested that vasopressin secretion is under the control of glucocorticoid negative feedback [3, 4]. Thus, glucocorticoid deficiency stimulates the secretion of ADH, and this would explain the hyponatremia, by the impaired water excretion and the increase in renal sodium excretion. Hypothyroidism may also have contributed to the hyponatremia by ADH-dependent or ADH-independent mechanisms [5].

Several isolated cases of hyponatremia associated with hypopituitarism have been reported; one of the most thorough series is by Olkers [1], which includes 5 cases of hyponatremia in patients with panhypopituitarism of differing etiologies such as empty sella syndrome, postpartum pituitary infarction and an idiopathic one.

How to best classify hyponatremia associated with hypopituitarism is currently controversial. Some authors, due to the excessively high level of ADH for serum osmolality, include it within SIADH [1]. Other investigators consider glucocorticoid deficiency within the hyponatremias with normal ex-

© 1995 S. Karger AG, Basel
0028-2766/95/0701-0139
\$8.00/0

tracellular volume but apart from SIADH [6, 7]. We favor this last opinion by the following reasons: (1) the deficit of glucocorticoid is not an osmotic but a physiological stimulus for ADH secretion [4]; (2) Bartter and Schwartz [8] established a normal adrenal function as prerequisite to define the SIADH, and (3) the efficiency of hydrocortisone in low doses [7]. In practical terms, this case illustrates that severe hyponatremia may be the presenting feature of hypopituitarism, and this should be kept in mind in the differential diagnosis of hyponatremias with normal extracellular volume.

References

Oelkers W: Hyponatremia and inappropriate secretion of vasopressin (antidiuretic hormone) in patients with hypopituitarism. *N Engl J Med* 1989;321:492-496.

Wakui H, Nishinari T, Nishimura S, Endo Y, Nakamoto Y, Miura AB: Case report: Inappropriate secretion of antidiuretic hormone in isolated adrenocorticotropin deficiency. *Am J Med Sci* 1991;301:319-321.

Raff H: Glucocorticoid inhibition of neurohy-pophysial vasopressin secretion. *Am J Physiol* 1987;252:R635-R644.

Gross PA, Ketteler M, Hausmann C, Ritz E: The charted and uncharted waters of hyponatremia. *Kidney Int* 1987;32:S67-S75.

Iwasaki Y, Oiso Y, Yamauchi K, Takatsuki K, Kondo K, Hasegawa H, Tomita A: Osmoregulation of plasma vasopressin in myxedema. *J Clin Endocrinol Metab* 1990;70:534-539.

Robertson GL, Berl T: Pathophysiology of water metabolism; in Brenner BM, Rector FC Jr (eds): *The Kidney*, ed 4. Philadelphia, Saunders, 1991, pp 677-736.

Goldberg M: Hyponatremia. *Med Clin North Am* 1981;65:251-269.

Barter FC, Schwartz WB: The syndrome of inappropriate secretion of antidiuretic hormone. *Am J Med* 1967;42:790-806.

140

Mora/Enríquez/Lacueva/Bonilla/González/ Severe Hyponatremia and Hypopituitarism
Llobregat