

Acute severe hyponatraemia caused by hypopituitarism from a non-functioning pituitary macroadenoma

Sarah Finer¹, Graham Toms¹, Philip J. Smith¹, William M. Drake². 1) Department of Diabetes and Endocrinology, Newham University Hospital, 2) Department of Endocrinology, St. Bartholemew's Hospital

A 67-year old Gujarati man presented with a 3 week history of low mood and personality change. A diagnosis of depression was made by his GP, and citalopram 20mg was prescribed but stopped taking it after 3 days when he developed mild nausea and vomiting. Over the next 2 days, he had further deterioration in his mood and became confused, but had no headache nor visual disturbance. His confusion worsened, he became drowsy and he was brought to the Emergency Department. On arrival, he suffered three generalized tonic-clonic seizures. In his past, he was noted to suffer from benign prostatic hypertrophy, and his only additional medication history was tamsulosin 400mcg. There was no family history of any illnesses. The patient was a retired office worker with no alcohol intake, nor smoking history. Examination revealed a euvolaemic thin man and dry skin, with pallor and hypotension. His GCS was 5/15 in the post-ictal state, with bilateral upgoing plantars but no other focal neurological deficit. He was not pigmented. Initial investigations revealed a capillary blood glucose of 5.0mmol/L, sodium 105mmol/L, potassium 3.8mmol/L, urea 3.4mmol/L, haemoglobin 10.9g/dL. A compensated metabolic (lactic) acidosis was evident on arterial blood gas analysis taken after his seizures.

His fitting was assumed to be due to acute severe hyponatraemia. The combination of hypotension and hyponatraemia was thought to be due to primary or secondary adrenal insufficiency, with possible contribution from vomiting and citalopram. Given this suspicion, he was given intramuscular hydrocortisone 100mg, after sending a paired random cortisol and ACTH. He was intubated and ventilated, received intravenous crystalloid resuscitation and was admitted to the intensive care unit. A non-contrast CT brain scan was normal and with no evidence of pituitary haemorrhage. His haemodynamic status improved rapidly following steroid treatment, and he required no inotropic support. Hypertonic saline (2.7%) was used to correct his serum sodium by 0.5mmol/hr.

Random serum cortisol at the time of presentation (after fitting) was 181nmol/L, ACTH <5ng/L, FT4 8.3pmol/L, TSH 0.66mU/L, LH 1.4mIU/ml, FSH 1.7mIU/ml, testosterone 2.9nmol/L, PRL 244 mU/L, IGF-1 139ng/ml (median 118), serum osmolality 235mmol/L and urine osmolality 378mmol/L. He had no visual field defect on Goldman perimetry, with normal Mantoux, serum angiotensin converting enzyme and tumour markers. A 15mm pituitary macroadenoma with no compression or invasion of local structures was seen on MRI. A diagnosis of a non-functioning pituitary macroadenoma with thyrotroph, corticotroph and gonadotroph deficiency was made.

He made good improvement and his neurological status and mood disturbance returned to normal. Steroid replacement was converted to oral hydrocortisone (10mg, 10mg, 5mg), and he commenced thyroxine replacement (25mg levothyroxine). His serum sodium normalised and his citalopram was stopped. The patient underwent transphenoidal hypophysectomy six weeks later, which was uneventful. He was discharged home on steroid and thyroxine replacement, and is due to have further testing of his gonadotropin and growth hormone axes to determine the need for replacement therapy.

Euvolaemic hyponatraemia is not an uncommon finding in secondary adrenal insufficiency, and its mechanism is due to release of glucocorticoid-mediated suppression of arginine vasopressin secretion, and consequent reduced renal free water clearance (Oelkers, 1989). Exaggerated AVP release is thought to be greater in the elderly, in whom hyponatraemia is seen more commonly with ACTH deficiency (Yatagai, 2003). Thyrotroph deficiency may also contribute to hyponatraemia through diminished ability to excrete free water, although the role of AVP in this process remains unclear. Finally, citalopram, is known to cause the syndrome of inappropriate ADH secretion and can occur within days of starting treatment

(Barclay, 2002). The combination of these three potential causal factors could account for the severity of this patient's euvolaemic hyponatraemia.