Clonidine-induced dilutional hyponatraemia

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Summary

A patient with a dilutional hyponatraemia induced by clonidine is described.

Introduction

An inappropriate secretion of antidiuretic hormone (ADH) (Bartter and Schwartz, 1967) has been associated with the administration of a variety of different drugs (Moses and Miller, 1974).

Case report

A 65-year-old woman was admitted with a 3-week history of persistent vomiting. She had been treated for several years for hypertension with clonidine 0.2 mg thrice daily, and chlorthalidone 50 mg twice daily. Initial investigations showed: serum sodium 131 mmol/l, potassium 2.6 mmol/l, chloride 90 mmol/l, bicarbonate 34 mmol/l, urea 7 mmol/l. She was treated with intravenous isotonic saline and potassium supplements and her vomiting ceased after 3 days. She was found to have an *Escherichia coli* urinary tract infection and was discharged from hospital taking the antihypertensive drugs and trimethoprim/sulphamethoxazole.

Nine days later she was readmitted after further nausea and vomiting. On admission, the patient's level of consciousness was normal but later she became confused and disorientated. There were no clinical signs of dehydration. The course of antibacterial therapy had been completed, and the antihypertensive drugs were stopped on admission. Serum electrolyte values on this occasion were: sodium 118 mmol/l, potassium 2.7 mmol/l, chloride 72 mmol/l, bicarbonate 31 mmol/l, and urea 5.7 mmol/l. The serum osmolality was 253 mosmol/kg and urine osmolality 659 mosmol/kg and the urinary sodium excretion was 198 mmol/24 hr. There was no evidence of a persisting urinary tract infection and adrenocortical insufficiency was excluded by a normal short tetracosactrin test (basal plasma cortisol 395 nmol/l rising to 1130 nmol/l at 30 min after intramuscular injection of 0.25 mg of

tetracosactrin). Initially the patient received treatment with intravenous saline and potassium supplements, but after evaluation of the above results fluid intake was restricted to 1 litre/day. There was a rapid improvement in the patient's confusion, and over 7 days serum sodium rose to 140 mmol/l and serum osmolality to 289 mosmol/kg. After a further week fluid intake was increased with no clinical or biochemical deterioration, and there was a normal response to a fluid challenge.

Further investigations were instituted to determine the cause of the apparent inappropriate ADH secretion. There was no evidence of malignancy or other disease in the chest, gastrointestinal tract or brain. Pituitary and thyroid function was normal and urinary porphyrins were not detected.

In view of the possibility of a drug-induced effect the patient's antihypertensive therapy was changed to methyldopa. In an attempt to clarify the position further and, if possible, to exclude an occult neoplasm the patient agreed to be investigated again several months later. During the intervening period, she had remained free of symptoms. Clonidine was reintroduced as treatment for her hypertension and methyldopa was stopped. Within 3 days she experienced nausea with vomiting and serum sodium fell from 139 to 129 mmol/l. Blood urea and serum creatinine levels were normal throughout. Serum osmolality was reduced from 290 to 264 mosmol/kg, while urine osmolality remained between 430 and 487 mosmol/kg. At no stage in these investigations was glycosuria or amino-aciduria detected. After stopping clonidine the patient rapidly recovered and has since remained free of any symptoms. Her blood pressure is now controlled with methyldopa.

Discussion

The authors consider that clonidine induced an inappropriate secretion of ADH in this patient. A similar disturbance has been reported with sulphonamide drugs and with thiazide diuretics, both of which were being taken by this patient at some stage. However, as the typical dilutional hyponatraemia was produced rapidly on the reintroduction of

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clonidine alone, it appears that this drug can be implicated specifically and this has not been reported before. Although a urinary tract infection was present on the patient's first admission, this was not the case subsequently, and there was no evidence of any renal tubular disorder.

References

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