

Amlodipine induced hyponatraemia

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Introduction

Hyponatraemia (serum sodium <135 mmol/L) is a common finding in clinical practice. Patients with hyponatraemia have increased morbidity and mortality compared with patients without hyponatraemia. Hyponatraemia is often iatrogenic and avoidable. These can be classified into 5 main types: hypovolaemic hyponatraemia, euvoalaemic hyponatraemia, hypervolaemic hyponatraemia, hypertonic hyponatraemia and pseudohyponatraemia. Patients can be asymptomatic to severe cerebral oedema, leading to brainstem herniation, respiratory arrest and death.

Case presentation

A 73-year-old man was admitted with a chronic hyponatraemia (125 mmol/L). His serum osmolality was 259 mmol/kg (low). Clinically he was euvoalaemic. His urine sodium was 50 mmol/kg (>20 mmol/kg) and urine osmolality was 276 mmol/kg (low). He had a background history of hypertension controlled with amlodipine. Amlodipine was substituted with bisoprolol after exclusion of other causes of hyponatraemia with thorough history, examination and investigations. On his subsequent blood test, serum sodium level and osmolality returned back to normal (135 mmol/L and 275 mmol/kg, respectively). In the absence of other causes and the resolution of biochemical abnormalities after withdrawing amlodipine, a diagnosis of amlodipine-induced hyponatraemia was made.

Discussion

Dihydropyridines are calcium antagonists (nifedipine and amlodipine) that reduce the entry of calcium into cells via voltage-sensitive channels in smooth muscle, thereby promoting peripheral vasodilatation. It also has natriuretic and diuretic characteristics. Another mechanism of hyponatraemia may be via direct action on the renal tubules with resultant increased sodium excretion and inhibition of renal sodium absorption. This natriuretic property promotes antihypertensive actions and they may be the mechanism causing hyponatraemia. It is a very rare cause of hyponatraemia. A high index of suspicion is needed. Depending on severity of hyponatremia, it can be treated with stopping the drug or, if needed, need extra fluid restriction. ■

References

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