Coconut water-induced hyperkalaemia

Introduction

Hyperkalaemia is a potentially life-threatening electrolyte disturbance because it causes cardiac dysrhythmias. Patients with renal impairment are at particular risk of potassium retention, often compounded by use of medications that inhibit potassium excretion, and are counselled to avoid potassium-rich foods.

Discussion

Coconut water is an increasingly popular rehydration drink. Recent years have seen rapid growth in its sales in the US and UK markets, supported in part by its celebrity endorsement as a health drink (Pearson, 2009). Several studies have promoted coconut water as an electrolyte-balanced sports drinks for healthy exercising populations (Saat et al, 2002; Ismail et al, 2007; Kalman et al, 2012), and it has been used as an oral rehydration fluid for treatment of acute diarrhoea in less economically developed countries (Rolston et al, 1990).

The electrolyte contents of coconut water, and comparisons with other widely used rehydration drinks and nutritional supplements, are shown in *Table 1*. Nonetheless, the high potassium content of coconut water is not widely appreciated by patients or physicians. It does not feature on many publicly available lists of potassium-rich foods and, unlike sodium, potassium concentrations are not routinely displayed on product labels in the UK. This led to this patient inadvertently consuming potassium substantially in excess of the recommended daily allowance (3.5 g/90 mmol) for individuals with normal renal function (NHS Choices, 2011).

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Conclusions

To the authors' knowledge, this is the first reported case of hyperkalaemia attributable to use of coconut water. Given its swiftly rising popularity in the UK, physicians need to be aware of its potassium content. The authors advise against its free ingestion in patients with renal disease, which can rapidly result in potentially life-threatening hyperkalaemia. BJHM

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Table 1. Electrolyte and carbohydrate contents of coconut water and other widely used rehydration or nutritional supplements

	Coconut water	Tap water	Dioralyte	Cola drink	Glucose-based sports drink	Ensure supplements
Sodium (mmol/litre)	46.3	1.7	40.2	1.8	17.5	36.2
Potassium (mmol/litre)	65.0	0.0	20.1	0.5	4.0	39.6
Magnesium (mmol/litre)	10.4	0.5	0.0	0.0	0.0	17.0
Calcium (mmol/litre)	6.1	0.8	0.0	0.5	0.3	31.3
Carbohydrate (g/litre)	37.6	0.0	17.8	99.2	66.2	161.9

LEARNING POINTS

- A full dietary history should be obtained from patients with unexplained hyperkalaemia.
- Coconut water is potassium-rich, and increasingly consumed in the UK.
- Patients with renal impairment should be cautioned against drinking unrestricted volumes of coconut water.

Case Report

A 26-year-old woman with type 1 diabetes mellitus and associated nephropathy, normally taking losartan, presented with accelerated phase hypertension. Her blood pressure on admission was 280/160 mmHg, serum creatinine was 350 μmol/litre and 24-hour urine albumin excretion was 4.2 g. The hypertension was successfully treated using a combination of amlodipine, doxazosin and cross-titration of losartan to ramipril. She was discharged with stable renal function and electrolytes, for ambulatory blood test monitoring while awaiting renal biopsy.

The day after discharge, her serum potassium was 5.8 mmol/litre. Over the subsequent 24 hours it rose precipitously to 7.7 mmol/litre, with T wave tenting on electrocardiography. Calcium gluconate and insulin-dextrose were administered, following which the potassium normalized and did not re-elevate. There was no explanatory deterioration in her renal function, nor deviation from her established medication doses. On further questioning, the patient recalled that as the weather had been unseasonably hot she had drunk over 2 litres of coconut water during the preceding 24 hours. This contained at least 5 g (130 mmoles) of potassium, supplemental to her normal dietary intake.