Correspondence

Potassium excretion indices in the diagnostic approach to hypokalaemia

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Sir,

Measurement of urinary potassium excretion is very helpful in the differential diagnosis of both hypokalaemia and hyperkalaemia. To determine urinary potassium excretion, it is preferable to collect a 24-h urine sample. However, this is not feasible in many cases. Random measurement of the urinary potassium concentration is simple to perform but may be less accurate than a 24-h collection, since it is influenced by two independent factors: potassium secretion and water reabsorption in the medulla. Therefore, the fractional excretion of potassium (FEK+) has been proposed as a useful marker of potassium excretion. This index relates the amount of potassium excreted to the amount filtered.

We have recently shown that in hypokalaemic patients with normal renal function FEK+ is a very useful tool in the diagnostic approach to hypokalaemia. In fact, FEK+ was >9% in all patients with hypokalaemia of renal origin, while a FEK+ <6.4% was consistent with appropriate potassium conservation, thus excluding hypokalaemia of renal origin and leading to the diagnosis of hypokalaemia of extrarenal origin. Recently, transtubular potassium gradient (TTKG), a new and simple index, has permitted the clinician to evaluate the potassium secretory process independently of the flow rate in a semiquantitative fashion. The TTKG is calculated as follows: TTKG=urine potassium / [(Posm/Uosm) / (serum potassium)]. This estimation is relatively accurate as long as the urine is not dilute and urine sodium concentration is ≥25 mmol/l, so that sodium delivery is not limiting. Taking into account these limitations the expected value during hypokalaemia is ≤2, while a higher value suggests that the potassium secretory process is inappropriately stimulated. In fact, in our cohort the mean TTKG in patients with hypokalaemia of extrarenal origin (n=48) was 1.2±0.3 (95%CI 0.7–1.85), while in hypokalaemic patients in whom renal potassium loss was the main aetiological factor for the pathogenesis of hypokalaemia (n=42) it was 9±2.6 (95%CI 2.6–17.2). At the same time, the FEK+ of the two groups was 2.75±0.9 (95%CI 1.55–6.2) and 14.5±2.5 (95%CI 9.1–24), respectively. Interestingly, a very good correlation between the two indices of potassium excretion was evident (r=0.68, p<0.01) and both indices could accurately differentiate hypokalaemia in all patients.
We conclude that even though 24-h urine potassium is the best way to examine potassium excretion in patients with abnormalities of potassium homeostasis, both FEK and TTKG are relatively reliable and convenient markers of potassium excretion, and could help the clinician with the diagnostic evaluation of hypokalaemia.

References


