

## Blood Pressure Reduction With Potassium Supplementation

Hypertension remains a major contributing factor for cardiovascular and cerebrovascular diseases. Optimal blood pressure (BP) control is therefore of great importance. Several nonpharmacological interventions exist to optimize BP, including the reduction of alcohol intake, weight loss, and limiting dietary sodium to <100 mmol/day (1). Notably, many clinical studies also support the BP-lowering effects of potassium supplementation (2–8).

In 1 placebo-controlled study of 104 hypertensive patients, a relatively low dose of potassium aspartate (30 mmol/day) led to statistically significant sustained reductions in office and 24-h ambulatory systolic and diastolic BPs ( $p < 0.001$ ) (2). Significant reductions ( $p < 0.001$ ) in both home ( $3.6 \pm 0.9$  mm Hg/ $1.7 \pm 0.5$  mm Hg) and 24-h systolic BP ( $3.4 \pm 1.0$  mm Hg/ $1.2 \pm 0.5$  mm Hg) was also observed in another randomized study of 55 patients with essential hypertension who were treated with potassium chloride supplementation (64 mmol/day) for 4 weeks compared with placebo (8). Participants in a larger randomized, double-blind, placebo-controlled trial ( $n = 150$ ) given potassium chloride (60 mmol/day) for 12 weeks also experienced significant reductions in systolic BP ( $-5.0$  mm Hg, 95% confidence interval:  $-2.1$  to  $-7.9$  mm Hg,  $p < 0.001$ ) (6).

Finally, a pooled meta-analysis of 33 randomized controlled trials on the effects of potassium chloride supplementation (average of 75 mmol/day) on BP in hypertensive and normotensive patients demonstrated a significant reduction in average BP of  $3.1/2.0$  mm Hg with potassium (3). The BP-lowering effects of potassium tended to be greater in hypertensive patients ( $4.4/2.5$  mm Hg) than in normotensive patients ( $1.8/1.0$  mm Hg) (3). The authors of that study concluded that “increased potassium intake should be considered as a recommendation for prevention and treatment of hypertension.”

Therefore, maintenance of adequate dietary potassium intake shows promise in the prevention and treatment of hypertension and should be thought of as part of the armamentarium of lifestyle changes.

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### Reply

We thank Drs. Kapoor and Kapoor for their interest in our paper (1) and are well aware of information that potassium supplementation ameliorates hypertension. In fact, this concept is well known and was described more than a quarter century ago (2,3). In most human studies, patients who were evaluated did not have resistant hypertension as defined by the current definition. In most clinical studies, potassium supplementation, although reducing blood pressure (BP), provides an average reduction of only 3 to 6 mm Hg in systolic pressure. Although this reduction is meaningful, such a reduction in BP would not be sufficient to supplant antihypertensive medications in resistant hypertensive patients. Moreover, we do specifically mention the importance of potassium levels when considering BP treatment, but because most patients with resistant hypertension have chronic kidney disease, hypokalemia is generally not as common a problem as hyperkalemia.

Finally, we had a case referral that was presented at the American Heart Association in 2007 for resistant hypertension. She was taking 3 full-dose antihypertensive medications with serum potassium of 3.2 mEq/l and was consuming a daily diet that contained 35 g of sodium, based on a 24-h urine result. After placing her on a 3-g sodium diet and administering amiloride and short-term potassium supplementation (i.e., 2 weeks) along with increasing her fruit and vegetable intake for 1 month, we were able to stop all of her antihypertensive medications. At this time, her serum potassium was corrected to 4.1 mEq/l, and her daily sodium intake was 2.8 g/day. Her blood pressure was reduced from 144/86 mm Hg on triple therapy to 128/82 mm Hg on no medications and a high-potassium, low-sodium diet. The lesson of this case is not just that potassium intake is important but that the balance of sodium, potassium, and probably magnesium are important for maintaining arterial homeostasis (4).

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