

**End of Study Report: Endothelial function, the renin-angiotensin-aldosterone axis (RAAS), and hypertension: the therapeutic role of potassium supplementation (part 1 of 2 part study – RGHT000502)**

There is limited evidence on the effect of potassium ( $K^+$ ) supplementation on endothelial function with three studies suggesting a beneficial effect in healthy volunteers and mild hypertensives. However potassium increases aldosterone levels due to a direct effect on the adrenal gland and there is evidence that aldosterone excess is detrimental to cardiovascular health. We aimed to determine the effect of  $K^+$  supplementation on 1. endothelial function and 2. brachial and central blood pressure, the RAAS and vascular inflammation.

Forty patients with >10% ten year cardiovascular risk were included in a randomised placebo controlled crossover study with 6 weeks of 64mmol potassium chloride daily/6 weeks placebo and a 6 week washout period. Endothelial function was assessed using global pulse wave analysis (PWA) involving the detection of a change in augmentation index to salbutamol (endothelial dependent) and GTN (endothelial independent) induced vasodilation.

$K^+$  supplementation improved brachial and central systolic blood pressure ( $p=0.013$  and  $0.011$  respectively) but did not affect endothelial function or high sensitivity CRP (hsCRP). Plasma renin activity ( $p=0.048$ ) and serum aldosterone ( $p=0.001$ ) both increased significantly with  $K^+$  supplementation compared to placebo. Serum  $K^+$  increased with supplemental  $K^+$  vs placebo ( $4.1$  vs  $3.9$ mmol/l;  $p=0.012$ ) but hyperkalaemia did not develop.

These data show that  $K^+$  supplementation lowered systolic blood pressure as reported previously. Interestingly  $K^+$  supplementation was associated with an increase in both renin and aldosterone suggesting that  $K^+$  may also stimulate the RAAS via the juxtaglomerular apparatus. Despite this rise in aldosterone  $K^+$  supplementation did not affect global PWA or hsCRP.