

Blood pressure and dietary sodium reduction in normotensive subjects

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Intervention studies with sodium supplementation in hypertensive and mildly hypertensive subjects support the hypothesis that higher sodium intake is associated with higher blood pressure. However, reductions in blood pressure in normotensive subjects with reduced sodium intake, within the usual range of sodium intake, has not been consistently demonstrated.

The aim of this study was to determine the effect of alterations of dietary sodium (Na) intake on blood pressure (BP) in normotensive subjects. Twins and family members were recruited to a double-blind, randomised crossover design where all subjects followed a low sodium diet (LS) (50mmol/day) for 8 weeks. Subjects took a placebo for 4 weeks and Na supplement (NaSup) for 4 weeks. All subjects provided one 24hr blood pressure measurement (AMBP) at baseline and at the end of each phase and 2, 24-hr urine collections. Home blood pressure measurements were conducted daily in the last week of each intervention phase.

One-hundred-and eight individuals (57 females, 33 males (mean age 45.1(8.9)(SD) years, not taking anti-hypertensive therapy commenced the study. Of these 89 completed the study (10 dropped out due to side effects from tablets, 9 from inability to comply with study demands). At baseline the mean AMBP was 122.4 ± 1.0 (\pm SEM) mmHg systolic (SBP)/ 75.6 ± 0.9 mmHg diastolic (DBP) and home BP was $117.8 \pm 1.6/73.5 \pm 1.0$, and the mean urinary sodium excretion 138.0 ± 6.0 mmol/day. Na excretion with NaSup was similar to baseline (Na 137 ± 4.2 mmol/day) and Na excretion was lower during LS phase 51.6 ± 4.3 mmol/day ($P < 0.001$). Home systolic BP was lower in LS phase 114.7 ± 1.3 mmHg versus 116.3 ± 1.3 with Na Sup ($P < 0.05$). There was no difference in AMBP between LS ($119.4 \pm 1.3/73.9 \pm 0.8$ mmHg) and the NaSup phase ($119.4 \pm 1.3/73.9 \pm 0.8$ mmHg). Na excretion was positively associated with 24-hr SBP at baseline ($R^2 = 0.12$, $\beta = 0.06(0.02)$ $P = 0.003$) and NaSup phase ($R^2 = 0.05$, $b = 0.05(0.03)$ $P = 0.057$).

SBP measured at home was 1.6 mmHg lower on a low sodium diet (50mmol/day) compared to a usual sodium intake (137 mmol/day). This effect was not seen with 24hr blood pressure measurement. This small reduction in blood pressure, seen in normotensive subjects within the normal range of sodium intake indicates the potential health benefits of a low sodium diet. These results are in agreement with the recent US study(1) which demonstrated a graded blood pressure reduction with a low sodium diet of 67 mmol/day in normotensive and hypertensive subjects.

1. Sacks FM, Svetkey LP, Vollmer WM, Appel LJ, Bray GA et al. Effects on blood pressure of reduced dietary sodium and the dietary approaches to stop hypertension (DASH) diet. *N Engl J Med* 2001; 344: 3–10.