

Concurrent Session 13: Salt and Cardiovascular Disease

Taste sensitivity to NaCl is associated with liking of salty foods and BMI

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Background – It is widely acknowledged that sodium is consumed in excess in most developed countries. Sodium (Na) consumption has been a target of public health interventions in recent years due to its link to numerous adverse health affects such as hypertension and cardiovascular disease. While much of the current research is directed at strategies to reduce sodium in foods and the diet, little is known about the factors which determine salt consumption and preference. Currently, there is no research relating NaCl taste sensitivity and liking of food, or if NaCl taste sensitivity may manifest in changes in BMI.

Objective – Establish whether a relationship exists between NaCl taste sensitivity, preference for salty foods and BMI.

Design – Taste sensitivity to NaCl was determined for 119 subjects (104 female) according to the procedure laid out by “ISO 3972:1991 – Method of investigating sensitivity of taste”. In a separate session subjects rated their liking of generic biscuit with 2 levels of added NaCl [low (2.9g/100g) & high (19.1g/100g)] using the 9-point hedonic scale. BMI was calculated from self reported height and weight data collected. Spearman’s rank order correlation was used to determine whether an association existed between NaCl taste sensitivity, preference for salty foods and BMI.

Outcomes – A significant positive correlation was found between BMI and NaCl taste sensitivity ($r=0.204$, $p<0.05$). In addition there was a significant positive correlation between BMI and liking of low NaCl biscuits ($r=0.267$, $p<0.01$). No significant associations were identified between the high NaCl cracker and NaCl taste sensitivity or BMI. A paired t-test showed there was no significant difference in liking of the low and commercial NaCl crackers ($p=0.078$).

Conclusion – This study revealed that individuals with a higher BMI have a greater liking of low NaCl biscuits, and this may be due to their increased NaCl taste sensitivity. The results suggest that NaCl taste sensitivity may be a factor in foods consumed by an individual which in turn may influence weight status.

Correlation of urinary sodium:creatinine with sodium intake and arterial function in hypertensive patients: an intervention study

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Background – Epidemiological studies of sodium (Na) restriction have demonstrated an association with blood pressure (BP) and cardiovascular disease. Reduction of Na in clinical and experimental studies has improved both vascular function and BP levels.

Objectives – To assess Na-sensitive alterations in **BP and vascular reactivity in response to dietary Na loading**.

Design – Thirty five volunteers with hypertension (either SBP>130 & DBP>90mmHg or on antihypertensive therapy) were recruited. Exclusion criteria were age <20 or >65years, smoking, BMI>30, cardiovascular disease, renal disease or diabetes. Volunteers were given dietary advice and counselling by a dietitian to reduce their Na intake to 60mmol/day. Following a 2 week run in participants were randomised to receive sequentially one of three interventions while continuing on the low Na diet: Treatment A –containing no Na (total Na 60mmol/day), Treatment B –containing 90mmol Na (total Na 150mmol/day) or Treatment C –containing 140mmol Na (total Na 200mmol/day). Participants consumed each treatment for four weeks with a 2 week wash out between interventions. Diet records and spot urinary sodium:creatinine (UNa:C) was used to monitor changes in dietary sodium intake and correlated with vascular function.

Outcomes – UNa:C increased from 6.5 to 11.8 in Treatment B ($p<0.001$) and 15.9 in Treatment C ($p<0.001$). Compared to baseline, BP increased in Treatment B and Treatment C by 6.3 ± 2.9 ($p=0.001$) and 8.2 ± 4.5 mmHg($p=0.002$) respectively. Carotid to femoral pulse wave velocity (PWV) was significantly increased in both Treatment B & Treatment C. There was no change in UNa:C, BP, or PWV in Treatment A.