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Sodium Density Associates with Nighttime Systolic Blood Pressure in Young Healthy Adults

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High sodium diets can lead to increased blood pressure (BP), arterial stiffness, and subsequent cardiovascular disease (CVD). Sodium recommendations aimed at lowering CVD risk are given in absolute amounts and do not account for total energy intake, making it difficult for individuals with greater energy intakes to meet daily recommended targets. Dietary sodium density (i.e. mg sodium/kcal energy) has been suggested to be a stronger determinant of BP than absolute sodium intake; however, the relation between sodium density and vascular health has yet to be studied in normotensive adults. **PURPOSE:** To examine the association between sodium density and ambulatory BP and arterial stiffness in young, normotensive, healthy adults. **METHODS:** Sixty-two participants (23M/39W, age 27±6 years, BMI 23.4±2.7 kg/m², BP 115±10/67±7 mmHg) recorded their habitual diet for three days and wore an ambulatory BP monitor to assess 24-hour, daytime, and nighttime BP. Arterial stiffness was assessed by pulse wave velocity (PWV) and wave reflection with augmentation index (AIx). Associations between absolute sodium intake and sodium density with BP and stiffness measures were assessed using bivariate and partial Pearson correlations. **RESULTS:** On average, participants consumed 2029±547 kcals and 3250 ± 1231 mg sodium. Sodium intake ($r=0.312$, $p=0.027$) and sodium density ($r=0.349$, $p=0.013$) both correlated with nighttime systolic BP but not nighttime diastolic BP nor daytime or 24 hr systolic or diastolic BP. After controlling for age and sex, both sodium intake ($r=0.436$, $p=0.014$) and sodium density ($r=0.564$, $p<0.001$) remained significantly associated with nighttime systolic BP. There were no significant correlations between sodium intake or sodium density and PWV or AIx (all $p>0.05$). **CONCLUSION:** These data suggest sodium density is associated with elevated BP, specifically nighttime systolic BP in healthy young men and women suggesting it relates to BP as strongly as absolute sodium intake.

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