

Arterial Stiffness and Central Systolic Blood Pressure Response to Dietary Sodium in Young and Middle-Aged Adults

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High dietary sodium intake has been associated with the development of hypertension and increased incidence of cardiovascular disease.

OBJECTIVE: The aim of this study was to determine the effect of short-term dietary sodium loading on arterial stiffness and central blood pressure in young (YG; 22-40 years old, n=49, 27±1 yrs) and middle-aged (MA; 41-60 years old, n=36, 52±1 yrs) normotensive adults.

METHODS: Subjects were randomized to 7 days of low sodium (LS: 20 mmol/d) and 7 days of high sodium diet (HS: 300 mmol/d). On the last day of each diet, carotid-femoral pulse wave velocity (PWV), central aortic pressure waveform (synthesized by radial artery applanation tonometry and generalized transfer function), and wave separation analysis were assessed.

RESULTS: In comparison to the LS diet, the HS diet elicited an increase in central systolic blood pressure (cSBP) in both YG (LS: 96±1 vs. HS: 99±1 mmHg, p < 0.05) and MA (LS: 106±2 vs. HS: 115±3 mmHg, p < 0.05). The increase in cSBP was greater in MA (YG: 4±1 vs. MA: 9±2, p < 0.05). In MA, HS elicited greater central forward wave amplitude (LS: 25±1 vs. HS: 29±1 mmHg, p < 0.05), central reflected wave amplitude (LS: 19±1 vs. HS: 23±1 mmHg, p < 0.05), and PWV (LS: 7.1±0.3 vs. HS: 7.7±0.5 ms, p < 0.05) whereas these were not different in the YG.

CONCLUSION: These data suggest that high sodium intake is associated with a greater increase in cSBP in MA that may be the result of increased arterial stiffness and forward and reflected wave amplitudes.

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