

Low mineral intake is associated with high systolic blood pressure in the Third and Fourth National Health and Nutrition Examination Surveys: could we all be right?

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Abstract

Analysis of the first National Health and Nutrition Examination Survey (NHANES) in 1984 revealed that a dietary pattern low in mineral intake, specifically calcium, potassium, and magnesium, was associated with hypertension in American adults. Using more recent survey data from NHANES III and NHANES IV, we re-examined the validity of this relationship. Blood pressure (BP) and nutrient intake data from 10,033 adult participants in NHANES III and 2311 adults in NHANES IV revealed findings similar to those of the earlier analysis, demonstrating that the association between inadequate mineral consumption and higher BP is valid and has persisted over two decades. Exploring this relationship further, we separated untreated hypertensive persons by hypertension type (systolic, diastolic, or both), and observed that the BP effect of low mineral intake was most pronounced in those with only systolic hypertension. We also observed that sodium intake was significantly lower in the systolic hypertension group and significantly higher in the diastolic hypertension group compared with the other groups. The nutrient pattern in the combined hypertension group was similar to that of the normotensive group. These findings may help to explain the inconsistent responses generally observed in dietary intervention studies, and they highlight the possible importance of tailored nutritional recommendations for hypertension based on hypertension category and individual dietary practices. Although randomized controlled trials are needed to characterize further the relationship between nutrient intake and hypertension type, these findings indicate that dietary management of hypertension may be more effective if the focus is on the overall nutritional profile rather than single-nutrient intake as currently recommended for most patients.