ORIGINAL ARTICLE

Association of Urinary Sodium Excretion With Blood Pressure and Cardiovascular Clinical Events in 17,033 Latin Americans

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BACKGROUND
Information on actual sodium intake and its relationships with blood pressure (BP) and clinical events in South America is limited. The aim of this cohort study was to assess the relationship of sodium intake with BP, cardiovascular (CV) events, and mortality in South America.

METHODS
We studied 17,033 individuals, aged 35–70 years, from 4 South American countries (Argentina, Brazil, Chile, and Colombia). Measures of sodium excretion, estimated from morning fasting urine, were used as a surrogate for daily sodium intake. We measured BP and monitored the composite outcome of death and major CV events.

RESULTS
Overall mean sodium excretion was 4.70 ± 1.43 g/day. A positive, nonuniform association between sodium and BP was detected, with a significant steeper slope for the relationship at higher sodium excretion levels ($P < 0.001$ for interaction). With a median follow-up of 4.7 years, the primary composite outcome (all-cause death, myocardial infarction, stroke, or heart failure) occurred in 568 participants (3.4%). Compared with sodium excretion of 5–6 g/day (reference group), participants who excreted >7 g/day had increased risks of the primary outcome (odds ratio (OR) 1.73; 95% confidence interval (CI) 1.24 to 2.40; $P < 0.001$), as well as death from any cause (OR 1.87; 95% CI 1.23 to 2.83; $P = 0.003$) and major CV disease (OR 1.77; 95% CI 1.12 to 2.81; $P = 0.014$). Sodium excretion of <3 g/day was associated with a statistically nonsignificant increased risk of the primary outcome (OR 1.20; 95% CI 0.86 to 1.65; $P = 0.26$) and death from any cause (OR 1.25; 95% CI 0.81 to 1.93; $P = 0.29$), and a significant increased risk of major CV disease (OR 1.50; 95% CI 1.01 to 2.24; $P = 0.048$), as compared to the reference group.

CONCLUSIONS
Our results support a positive, nonuniform association between estimated urinary sodium excretion and BP, and a possible J-shaped pattern of association between sodium excretion over the entire range and clinical outcomes.

Keywords: sodium intake; blood pressure; cardiovascular disease; hypertension; mortality.

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Hypertension (HTN) is a leading underlying cause of death, stroke, and myocardial infarction.[1–3] In South America, the prevalence of HTN varies from 9% to nearly 50%, depending on geographical areas and extents of diagnosis, awareness, treatment, and control of HTN.[4,5] Around 13% of deaths and 5.1% of disability-adjusted life years in Latin America have been attributed to HTN.[6] Since sodium intake is regarded as a key determinant of blood pressure (BP), reducing sodium intake has been proposed as a compelling strategy for cardiovascular (CV) disease prevention.

Current Latin American guidelines recommend a low sodium intake (less than 2.4 g/day) for CV prevention.[7–9] However, the optimal range of sodium intake for CV health remains unresolved. In recent years, from 1990 to 2010, numerous countries in Latin America have experienced substantial changes to their diet, including an increase in the consumption of foods that are generally not recommended such as processed and fried food.[10] Given that the effect of sodium intake on BP is influenced by the background diet, it is important to assess the association between sodium intake and CV outcomes within specific geographic regions in the context of the local culture and nutritional practices.[11] Currently, Latin American guidelines are developed based on extrapolation of data mostly from North America

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