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Letters to the Editor

Could Serum Sodium Predict Cardiovascular Death in the General Population? A Focus on the Chinese Population

To the Editor:

We read with great interest the article by Xin He et al.[1] The authors demonstrated the serum sodium was inversely associated with the risk of cardiovascular death in the general American population, especially in those without history of malignancy. Previous research also has revealed the correlation between hyponatremia and cardiovascular death.[2,3] However, those previous reports were based on Western populations. Data that display the association in Asian population, especially the Chinese population, are limited. Therefore, we investigated this issue in a community-based study including a total of 11,694 Chinese participants. Our population was restricted to subjects without history of malignancy. The study design was described in detail in our earlier report.[4]

During 44,202 person-years of follow-up, there were 578 cases of cardiovascular deaths in our population. Our results are presented in Table 1. In the crude model, the association between serum sodium and the risk of cardiovascular death (hazard ratio [HR] 1.141 per SD, 95% confidence interval [CI] 0.988-1.319; $P = 0.074$) was close to significant. Meanwhile, no significant correlation between serum chloride and cardiovascular death was observed (HR 0.891 per SD, 95% CI 0.770-1.031; $P = 0.122$). When adjusting for age, the HRs for serum sodium (0.994 per SD, 95% CI 0.852-1.160; $P = 0.941$) and serum chloride (0.891 per SD, 95% CI 0.770-1.032; $P = 0.124$) became more insignificant regarding cardiovascular death. After further adjustment of sex, race, education, family income, smoking status, body mass index, heart failure, myocardial infarction, stroke, diabetes, hypertension, hypercholesterolemia, and estimated glomerular filtration rate, we still found that serum sodium (HR 1.005 per SD, 95% CI 0.860-1.175; $P = 0.948$) and serum chloride (H: 0.918, 95% CI 0.790-1.066; $P = 0.264$) could not predict the risk of cardiovascular death in our population.

Under this scenario, we consider the question of whether serum sodium is an independent predictor of cardiovascular mortality to still be worthy of investigation in more population studies, especially in Chinese or Asian populations.

Wenrui Shi, MD
Yaping Zhou, MD
Yingxian Sun, PhD
yingxiansun_cmu1h@outlook.com

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Disclosures

The authors have no conflicts of interest to disclose.

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Table 1. Cox proportional hazards models assessing the correlations between serum sodium or serum chloride and the risk of cardiovascular death (n = 578 cardiovascular deaths)

	Serum sodium		Serum chloride	
Regression model	HR (95% CI)	*P*	HR (95% CI)	*P*
Crude model	1.141 (0.988-1.319)	0.074	0.891 (0.770-1.031)	0.122
Age-adjusted model	0.994 (0.852-1.160)	0.941	0.891 (0.770-1.032)	0.124
Fully adjusted model	1.005 (0.860-1.175)	0.948	0.918 (0.790-1.066)	0.264

Crude model: no adjustment; age-adjusted model: adjusted for age; fully adjusted model: adjusted for age, sex (male or female), race (Han or other), education (less than high school, high school, or more than high school), family income (< 5000 CNY, 5000-20,000 CNY, or ≥ 20 000 CNY), smoking status (current, former, or never), body mass index (BMI) (< 18.5 kg/m^2, 18.5-25 kg/m^2, 25-30 kg/m^2, 30-35 kg/m^2, or ≥ 35 kg/m^2), heart failure, myocardial infarction, stroke, diabetes (fasting plasma glucose ≥ 7 mmol/L, self-report, or on antidiabetic medications), hypertension (blood pressure ≥ 140/90 mm Hg, self-report, or on antihypertensive medications), hypercholesterolemia (serum total cholesterol ≥ 240 mg/dL or on anticholesterol medications), and estimated glomerular filtration rate (< 30 mL/min/1.73 m^2, 30-60 mL/min/1.73 m^2, 60-90 mL/min/1.73 m^2, or ≥ 90 mL/min/1.73 m^2).

CI, confidence interval; HR, hazard ratio.

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