The Relation of Serum Potassium Concentration with Cardiovascular Events and Mortality in Community-Living Individuals

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Abstract

Background and objectives Hyperkalemia is associated with adverse outcomes in patients with CKD and in hospitalized patients with acute medical conditions. Little is known regarding hyperkalemia, cardiovascular disease (CVD), and mortality in community-living populations. In a pooled analysis of two large observational cohorts, we investigated associations between serum potassium concentrations and CVD events and mortality, and whether potassium-altering medications and eGFR<60 ml/min per 1.73 m^2 modified these associations.

Design, setting, participants, & measurements Among 9651 individuals from the Multi-Ethnic Study of Atherosclerosis (MESA) and the Cardiovascular Health Study (CHS), who were free of CVD at baseline (2000-2002 in the MESA and 1989-1993 in the CHS), we investigated associations between serum potassium categories (<3.5, 3.5-3.9, 4.0-4.4, 4.5-4.9, and ≥5.0 mEq/L) and CVD events, mortality, and mortality subtypes (CVD versus non-CVD) using Cox proportional hazards models, adjusting for demographics, time-varying eGFR, traditional CVD risk factors, and use of potassium-altering medications.

Results Compared with serum potassium concentrations between 4.0 and 4.4 mEq/L, those with concentrations ≥5.0 mEq/L were at higher risk for all-cause mortality (hazard ratio, 1.41; 95% confidence interval, 1.12 to 1.76), CVD death (hazard ratio, 1.50; 95% confidence interval, 1.00 to 2.26), and non-CVD death (hazard ratio, 1.40; 95% confidence interval, 1.07 to 1.83) in fully adjusted models. Associations of serum potassium with these end points differed among diuretic users ($P_{interaction}$<0.02 for all), such that participants who had serum potassium ≥5.0 mEq/L and were concurrently using diuretics were at higher risk of each end point compared with those not using diuretics.

Conclusions Serum potassium concentration ≥5.0 mEq/L was associated with all-cause mortality, CVD death, and non-CVD death in community-living individuals; associations were stronger in diuretic users. Whether maintenance of potassium within the normal range may improve clinical outcomes requires future study.

Epidemiology and outcomes | mortality risk | serum potassium | Atherosclerosis | Cardiovascular Diseases | Demography | diuretics | Ethnic Groups | glomerular filtration rate | Humans | Hyperkalemia | Potassium | Proportional Hazards Models | Reference Values | Renal Insufficiency, Chronic | risk factors

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