Association of Urinary Calcium Excretion with Serum Calcium and Vitamin D Levels

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BACKGROUND AND OBJECTIVES
Population-based data on urinary calcium excretion are scarce. The association of serum calcium and circulating levels of vitamin D [25(OH)D2 or D3] with urinary calcium excretion in men and women from a population-based study was explored.

DESIGN, SETTINGS, PARTICIPANTS, & MEASUREMENTS
Multivariable linear regression was used to explore factors associated with square root-transformed 24-hour urinary calcium excretion (milligrams per 24 hours) taken as the dependent variable with a focus on month-specific vitamin D tertiles and serum calcium in the Swiss Survey on Salt Study.

RESULTS
In total, 624 men and 669 women were studied with mean ages of 49.2 and 47.0 years, respectively (age range=15-95 years). Mean urinary calcium excretion was higher in men than in women (183.05 versus 144.60 mg/24 h; P<0.001). In adjusted models, the association (95% confidence interval) of square root urinary calcium excretion with protein-corrected serum calcium was 1.78 (95% confidence interval, 1.21 to 2.34) mg/24 h per milligram per deciliter in women and 0.59 (95% confidence interval, -0.11 to 1.29) mg/24 h per milligram per deciliter in men. Men in the third 25(OH)D3 tertile had higher square root urinary calcium excretion than men in the first tertile (0.99; 95% confidence interval, 0.36 to 1.63 mg/24 h per nanogram per milliliter), and the corresponding association was 0.32 (95% confidence interval, -0.22 to 0.85) mg/24 h per nanogram per milliliter in women. These sex differences were more marked under conditions of high urinary sodium or urea excretions.

CONCLUSIONS
There was a positive association of serum calcium with urinary calcium excretion in women but not men. Vitamin 25(OH)D3 was associated with urinary calcium excretion in men but not women. These results suggest important sex differences in the hormonal and dietary control of urinary calcium excretion.
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