

Relative Supersaturation of 24-Hour Urine and Likelihood of Kidney Stones

Session Information

- Mineral Disease: Nephrolithiasis
November 02, 2017 | Location: Hall G - Posters
Abstract Time: 10:00 AM - 12:00 PM

Category: Mineral Disease

- 1204 Mineral Disease: Nephrolithiasis

Authors

- Prochaska, Megan, Brigham and Women's Hospital, Boston, Massachusetts, United States
- Taylor, Eric N., Maine Medical Center, Portland, Maine, United States
- Ferraro, Pietro Manuel, Fondazione Policlinico Universitario A. Gemelli, Rome, ROME, Italy
- Curhan, Gary C., Channing Division of Network Medicine, Brigham and Women's Hospital, Boston, Massachusetts, United States

BACKGROUND

Relative supersaturations of calcium oxalate, calcium phosphate, and uric acid are used clinically in kidney stone prevention. However, the magnitudes of association between levels of relative supersaturation and stone risk require further quantification.

METHODS

We performed a cross-sectional study using 24-hour urine collections from 2,505 stone formers and 1,267 controls from the Nurses' Health Study I (NHS I), Nurses' Health Study II (NHS II), and Health Professional Follow-up Study (HPFS) cohorts to quantify the association between level of calcium oxalate, calcium phosphate, and uric acid relative supersaturations and the likelihood of being a stone former.

RESULTS

The relative risks (RR) for being a stone former were 5.85 (3.40 to 10.04) in NHS I and 6.38 (3.72 to 11.0) in NHS II for calcium oxalate relative supersaturation of 3.0 or greater compared with <1.0, and the RR was 6.95 (3.56 to 13.6) in HPFS for calcium oxalate relative supersaturation of 4.0 or greater compared with <1.0. The RR for being a stone former were 1.86 (0.92 to 3.71) for NHS I, 4.37 (2.68 to 7.10) for NHS II, and 3.59 (2.04 to 6.31) for HPFS for calcium phosphate relative supersaturation category of 4.0 or greater compared with <1.0. For uric acid relative supersaturation, the relative risks for being a stone former were 4.30 (2.34 to 7.90) for NHS I and 2.74 (1.71 to 4.40) for NHS II for the highest relative supersaturation category of 4.0 or greater compared with <1.0. In HPFS, uric acid relative supersaturation was not significantly associated with likelihood of stone formation.

CONCLUSION

The likelihood of being a stone former increases with higher calcium oxalate and calcium phosphate relative supersaturation levels in men and women, and higher relative supersaturation levels of uric acid in women. This increase begins at levels below the currently accepted 'normal' values.

Funding

- NIDDK Support