

ABSTRACT: TH-PO1077

Absolute Compared with Percentage Differences in 24-Hour Urine Oxalate and Likelihood of Being a Kidney Stone Former

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BACKGROUND

Higher absolute differences in 24-hour urine oxalate have been demonstrated to be associated with risk of kidney stone formation, but there are no published data about the magnitude and shape of the associations per 20% increase. For the latter, the change is dependent on the starting value, which has implications for intervention studies.

METHODS

In three large cohort studies (Nurses' Health Study (NHS) I, NHS II and Health Professionals Follow-Up Study (HPFS)), we obtained 24-hr urine collections from individuals with and without a history of kidney stones. We calculated the likelihood of being a stone former per 10 mg/d and also per 20% higher 24-hour urine oxalate. For the former, logistic regression was used to calculate odds ratios of being a stone former. For the latter, we used a logarithmic approach such that the interpretation of the coefficient was the increase in risk per 20% higher urine oxalate (on a non-linear, continuous scale). The analyses adjusted simultaneously for age and all 24-hr urinary factors. The initial analysis used a single 24-hr urine (N=3775). A secondary analysis used the subset of participants who had completed two 24-hr urine collections (N=2426).

RESULTS

Spline plots showed that the relation was not linear so the 'per 10 mg/d' results were biased. Using a non-linear model, the per 20% higher urine oxalate multivariable adjusted relative risk (MVRR) for the single urine collection was 1.15 (0.85, 1.57), $p=0.37$ for NHS I, 1.10 (0.81, 1.48), $p=0.54$ for NHS II, and 1.17 (1.00, 1.36), $p=0.04$ for HPFS. The per 20% higher urine oxalate MVRR for the average of two urine collections was 1.37 (1.23, 1.53), $p<0.001$ for NHS I, 1.22 (1.11, 1.33), $p<0.001$ for NHS II, and 1.17 (1.07, 1.29), $p=0.001$ for HPFS. When we pooled the estimates for the non-linear model, the MVRR using the single collection, was 1.15 (1.02, 1.31), $p=0.02$ and for the average of two collections was 1.25 (1.14, 1.36), $p<0.001$.

CONCLUSION

These data strongly support an independent non-linear association between higher 24-hr urine oxalate and likelihood of stone formation, which must be taken into consideration when designing oxalate reduction trials.

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Curhan GC et al. J Am Soc Nephrol 28, 2017:381.