Is there a better way to work-up kidney stones?

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See related article on page 117

Nephrolithiasis represents a significant burden of illness for Canadians. It has a lifetime risk of 10%–15% and a recurrence risk of up to 50% within 5–10 years and up to 75% at 20 years.[1] While most stones pass spontaneously, the direct and indirect costs of managing stones in the United States was estimated to be in excess of US$5.3 billion in 2000.[2] Although shock wave lithotripsy and endourologic procedures have revolutionized surgical stone therapy and allow the vast majority of stones to be treated in a minimally invasive fashion, most patients would prefer stone prevention to stone recurrence.

The question then becomes that of determining the optimal method for diagnosing the etiology of stone formation in particular patients so that a coherent and evidence-based prevention strategy encompassing dietary recommendations and medical therapy can be implemented. The current gold standard for assessing stone formation risk includes multiple 24-hour urine assessments carried out along with serum electrolyte measurements. Rossi and colleagues[3] present data comparing centralized laboratory assessments of calcium oxalate and calcium phosphate supersaturation with 24-hour urine assessments of concentrations. The authors demonstrate that in 150 stone formers 24-hour urine concentration values tend to overestimate the number of patients at risk for supersaturation (i.e., 24-hour urine concentrations have a high false-positive rate or lower specificity). They suggest that measurement of urinary supersaturation might prevent overtreatment of patients at risk for stone recurrence.

It is premature, however, to recommend replacing 24-hour urine collection with centralized urinary supersaturation assessments. The patients in the current study were known stone formers and were undergoing treatment at the time of study, and so they may not be representative of *de novo* stone formers or of patients not on stone-prevention therapy. In addition, although it is theoretically appealing, there are no prospective data available to suggest that patients followed with serial urinary supersaturation (rather than 24-hour urine collections) have lower risk for stone recurrence or more favourable clinical outcomes, nor are there data to suggest that altering urinary supersaturation alters the natural history of stone formation. Further, a formal cost–benefit analysis of centralized urinary supersaturation versus 24-hour urine collection is needed to assess the trade-offs between a more costly test (the former) and a test with potentially more false-positive results (the latter). Finally, it is not surprising that the measured supersaturation of calcium oxalate and calcium phosphate will be lower than supersaturation levels calculated from 24-hour collection data because the latter data do not account for ionic stabilizers and stone inhibitors such as citrate. Perhaps modification to Equil 2 calculations to incorporate citrate concentration might lead to a more accurate estimation of supersaturation from 24-hour urine values. More work is clearly needed before it is recommended that physicians replace the venerable 24-hour urine collection (imperfect and limited though it is) in the medical evaluation of recurrent stone formers.

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