Metabolic testing of the first-time calcium oxalate stone former: Is it indicated? No

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Metabolic evaluation of the first-time stone former is based on the premise that through identification of the underlying mechanism(s) of stone formation, a tailored and individualized approach to prevention, either by specific dietary or medical therapies, can significantly reduce further symptomatic stone episodes. It is well-established that first-time stone formers under the age of 18, those with uric acid, cystine or pure calcium phosphate stone compositions should be evaluated due to their significant risk of underlying metabolic abnormalities and the likelihood that specific medical prophylactic interventions will be of value.[1]

The proponents of an in-depth metabolic evaluation of all first-time calcium oxalate stone formers argue that this strategy leads to a reduction in future symptomatic stone events for these patients as well. While at first glance, it is hard to discount this assertion, the real points of contention are whether this approach is truly clinically beneficial and cost-effective. Hampering the ability to convincingly answer this question is the relative paucity of high quality randomized clinical trials (RCTs) specifically assessing the benefits of medical investigation and therapy in the low-risk stone former. With this caveat, in this article I will summarize the evidence suggesting that metabolic evaluation is not indicated for the first-time calcium oxalate stone former.

The risk of recurrence for a first-time calcium oxalate stone former is estimated to be 50% within 5 to 10 years.[2,3] Although this would seem to be a high rate of recidivism and laudable to try to reduce the risk, it has been estimated that only 10% to 20% of further stones are symptomatic after the initial event, and only 50% of patients with a symptomatic stone require intervention.[4] As such, the value of assessing all patients must be subject to a healthy degree of skepticism.

Chandhoke has shown that the metabolic evaluation of the first-time calcium stone former without risks based on historical factors is often normal, or the only finding is a low urinary volume.[2] The yield for detecting other significant predisposing factors is increased in those patients with a family history, or a history of bone or bowel disease. Similarly, in patients with a solitary kidney or when their livelihood mandates a stone-free state, a comprehensive metabolic evaluation seems completely prudent. For all other first-time calcium oxalate stone formers, however, encouraging an increase in fluid intake and basic dietary counselling directed at reducing sodium and oxalate consumption and normalizing calcium intake are all that is required. The evidence to support this type of practical approach is strong. A strategy of empiric medical and dietary therapy without in-depth knowledge of the patient's metabolic background has been shown to be of value in reducing future stone occurrences. [5,6] Moreover, Hosking and colleagues showed that even the simple directive to patients to increase fluid consumption can have a significant impact on reducing the likelihood of future stone formation.[7] Similarly, a prospective RCT of 199 first-time calcium stone formers randomized to a high fluid intake versus no specific recommendation found the risk of stone recurrence was 12% versus 27%, respectively, over a 5-year period ($p = 0.008$).[8] This simple intervention had a dramatic effect on stone reformation, without the need for in-depth assessment.

The cost of metabolic testing and medical intervention is not insignificant and must also be considered. Chandhoke conducted an international survey involving 10 countries to compare the costs of metabolic evaluation and medical prophylaxis measures versus situational management of acute stone episodes.[9] The countries in this study included Australia, Canada, Germany, Italy, Japan, Sweden, Switzerland, Turkey, United Kingdom and the United States. Although the actual costs varied from country to country, a consistent finding was the observation that metabolic assessment and medical therapy were only cost-effective when there was at least 1 stone event every 3 years. Lotan and colleagues also reviewed the international economics of conservative, empiric medical therapy or directed medical therapy based on a comprehensive metabolic evaluation using data from the same 10 countries.[10] Conservative therapy in this study was defined as dietary modification only without metabolic evaluation or medical therapy. The authors noted a stone recurrence rate on conservative therapy of 1 stone every 14 years (0.07 stones/patient/year). With the exception of the United Kingdom, conservative therapy

was the least expensive approach and was 5% of the cost of directed medical therapy based on a comprehensive metabolic evaluation. The authors concluded that conservative measures are not only efficacious, but also cost-effective in most jurisdictions.

Although a number of authors have reported that the medical evaluation of all first-time calcium stone formers is useful, many of these studies have included patients who are at higher risk for recurrence. Properly conducted randomized trials comparing the patients truly at low risk for stone recurrence are sorely needed. Practical, clinical care guidelines would be helpful in shedding more light on this controversial issue. A guideline is in development by the Canadian Urological Association Guidelines Committee reflecting a consensus opinion of a number of Canadian stone experts. This document will soon be posted on the CUA website (www.cua.org) and it is hoped that this information will be useful to Canadian urologists and their patients.

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