

STONE DISEASE

Cost-effectiveness of medical expulsive therapy using alpha-blockers for the treatment of distal ureteral stones

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Objective: Medical expulsive therapy (MET) has recently emerged as an efficacious and safe option for the initial management of ureteral stones. The objective of this study was to assess the cost-effectiveness of MET compared with conservative therapy for the treatment of ureteral stones using international cost data from the United States and four European countries.

Material and Methods: A decision analysis model was built with the use of TreeAge Pro 2004 software with linear success rate assumptions. The likelihood of spontaneous passage of ureteral stones according to their size and location was estimated with the use of data derived from a published meta-analysis. The estimated cost of ureteroscopy (URS) in the United States (\$4973) was based on the mean cost of 121 consecutive cases performed at a large metropolitan hospital. URS costs for other countries were obtained from a published international survey. The cost of tamsulosin (\$2.08 per day), currently the most commonly used medical expulsive agent, was estimated as a mean of the costs obtained from two national pharmacy chains. MET and conservative therapies were compared with the use of one-way and two-way sensitivity analyses.

Results: In the United States, MET using tamsulosin resulted in a \$1132 cost advantage over observation. MET maintained its cost advantage even in countries where the cost of URS is much lower than in the United States. Two-way sensitivity analysis showed that MET remained cost-effective even with very low rates of spontaneous passage, minimal benefit of MET, or low cost of URS.

Conclusion: MET is a cost-effective strategy for the management of distal ureteral stones-even those with a low rate of spontaneous passage-providing another incentive for initial “facilitated observation” before embarking on surgical intervention.

Editorial Comment

Medical expulsive therapy has gained acceptance as a safe and efficacious option for the management of ureteral calculi, and is now incorporated into the new American Urological Association practice guidelines for ureteral stones. The authors present an elaborate evaluation of the cost-effectiveness of medical expulsive therapy (MET) compared to conservative therapy for ureteral stones from a global perspective.

One might argue that the acute management of renal colic and the postoperative course following ureteroscopy is not uniformly conducted in the outpatient setting, as assumed in the decision model. Though based on a historical metaanalysis, the spontaneous stone passage rates utilized in this decision making tree (< 4 mm 38%, > 6 mm 1%) is lower than more recent studies would suggest for distal ureteral stones. Indeed, in our practice we would counsel patients with a 3 mm distal stone that they have a 70% chance of spontaneous stone passage and a patient with a 6 mm distal stone would have a 30% chance (1). This aspect of the study design would accentuate the cost-advantages of MET predicted by the decision making model. The authors assumed that the cost of follow-up would be the same in each group; however, one would anticipate that the need for follow-up imaging, unanticipated emergency room visits and lost wages would be lower in the MET group. This aspect of the study design would diminish the potential cost-benefit for the MET approach.

As such, the study serves the important function of quantifying the expected - that improving stone passage will save money in addition to saving patient morbidity. It highlights the large discrepancy in global health care costs – a topic for another day.

Reference

1. Coll DM, Varanelli MJ, Smith RC: Relationship of spontaneous passage of ureteral calculi to stone size and location as revealed by unenhanced helical CT. *AJR Am J Roentgenol.* 2002; 178: 101-3.

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Practical use of investigations in patients with hematuria

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Objective: The majority of patients with microscopic hematuria undergo a complete evaluation resulting in negative findings. The outcome of patients with hematuria was analyzed in an effort to optimize the use of investigations.

Patients and Methods: The records for 404 patients who presented with hematuria were reviewed. Data were collected on demographics, type of hematuria, investigations, and final diagnosis.

Results: The hematuria was microscopic in 140 patients (35%) and gross in 264 patients (65%). In gross hematuria patients, 10% had urinary tract tumors and 12% had calculi. All patients with genitourinary tumors and 87% of patients with calculi had gross hematuria and/or 5 RBCs/HPF (red blood cells per highpower microscopic field) on urinalysis. The sensitivity and specificity were 94% and 6% for the dipstick urine test, 37% and 71% for urine cytology, 92% and 93% for computed tomography (CT), 50% and 95% for ultrasound scans, and 38% and 90% for intravenous pyelography, respectively. Logistic regression analysis showed that age and number of RBCs/HPF in the urinalyses were the only significant factors predicting genitourinary cancer. In patients 40 years old, there was one patient with malignancy and seven patients with stones. In older patients, there were 31 patients with malignancy and 32 patients with stones.

Conclusions: Patients with 5 RBCs/HPF on three urinalyses are unlikely to have significant pathology and could possibly be followed up conservatively. Patients 40 years of age should have a noncontrast CT or ultrasound study if they present with microscopic hematuria, and a cystoscopy should be added if gross hematuria exists. In older patients, a pre- and postcontrast CT and a cystoscopy should be performed.

Editorial Comment

The authors' findings suggest some significant differences in management approaches to those proposed in the American Urological Association practice guidelines. Most importantly, they suggest a cut-off of ≥ 5 RBC/hpf on microscopic evaluation as the threshold for which a hematuria work-up should be initiated. This contrasts to the ≥ 3 RBC/hpf threshold set by the AUA. As 17% of patients in their cohort had 3 or 4 RBC/hpf, a significant number of evaluations could have been avoided, resulting in savings of cost and patient discomfort. In addition, the authors draw a sharp distinction in the extent of work-up required for the younger patient with microhematuria – suggesting non-contrast imaging and no cystoscopy.

However, it is important to emphasize that this study does not represent a screening population with a urinalysis performed at a primary care point of care. Rather, it is a select cohort of patients referred for urologic

evaluation. Secondly, there was no standardization of imaging protocol or follow-up for delayed presentation of malignancy, to confirm the sensitivity of the ≥ 5 RBC/hpf approach.

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