



Microscopic hematuria as a predictive factor for detecting bladder cancer at cystoscopy in women with irritative voiding symptoms

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KEY WORDS

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Objective: The purpose of this study was to assess microscopic hematuria as a predictive factor for detecting bladder cancer at cystoscopy in women with irritative voiding symptoms.

Study design: We conducted a retrospective cohort analysis of women with irritative voiding symptoms who presented for urodynamic testing and cystoscopy. Irritative voiding symptoms were defined as urgency, urge incontinence, frequency, dysuria, and/or nocturia. Patient demographics, risk factors for bladder cancer, presence of microscopic hematuria, urodynamic findings, and cystoscopy and biopsy results were recorded.

Results: Of 735 patients with irritative voiding symptoms, 264 (35.9%) had microscopic hematuria and 471 (64.1%) had no hematuria. Bladder cancer was detected in 3 women, for an overall detection rate of 0.4%. Microscopic hematuria, urgency, frequency, dysuria, nocturia, age, and tobacco use were not significantly associated with bladder cancer.

Conclusion: In this cohort of women with irritative voiding symptoms, microscopic hematuria was not predictive for bladder cancer.

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Bladder cancer is estimated to affect 63,210 new individuals and to cause 13,180 deaths in the United States in 2005.¹ Risk factors for bladder cancer include age, white race, smoking, and exposure to carcinogens.² Men are also at higher risk than women, with greater incidence and mortality rates than women in all ethnic groups.³ Currently, cystoscopy is considered the gold standard for the diagnosis of bladder cancer, which

most commonly presents as gross or microscopic hematuria.^{2,4} Patients may also complain of irritative voiding symptoms, such as urgency, dysuria, and frequency.^{2,5}

The risk of bladder cancer in women with irritative voiding symptoms is unclear. Few studies have focused on this cohort of patients. Duldulao et al⁶ diagnosed 5 cases (3.9%) of transitional cell carcinoma in 128 women presenting with urge incontinence and/or irritative voiding symptoms. Sokol et al⁷ reported only 1 case of bladder cancer (0.2%) in 564 women evaluated for irritative symptoms. They concluded that cystoscopy should not be used routinely in the initial evaluation of women with these symptoms. However, others have

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Table I Patient demographics

Characteristic	Microscopic hematuria (n = 264)	No microscopic hematuria (n = 471)	P value
Age	58.0 ± 15.3	56.4 ± 15.1	.18*
Race			.96*
White	206 (78.0)	362 (77.0)	
Black	34 (12.9)	61 (13.0)	
Hispanic	6 (2.3)	11 (2.3)	
Asian	1 (0.4)	4 (0.9)	
Other	17 (6.4)	33 (7.0)	
Parity	2 (0-10)	2 (0-15)	.24†
Tobacco use	39 (14.8)	59 (12.5)	.39‡
Familial bladder cancer	1 (0.4)	7 (1.5)	.16‡
BMI	30.5 ± 7.9	29.0 ± 6.7	.01*

Data are presented as n (%), mean (± standard deviation) or median (range).

* P value from a Student *t* test.

† P value from a χ^2 test.

‡ P value from a median test.

recommended cystoscopy in women with irritative voiding symptoms, especially in the presence of hematuria.^{8,9}

The objective of this study was to assess whether microscopic hematuria was a predictive factor for detecting bladder cancer in large cohort of women presenting with irritative voiding symptoms.

Material and methods

After Institutional Review Board approval was obtained, we conducted a retrospective cohort study of all women with irritative voiding symptoms who presented for urodynamic testing and cystoscopy at our tertiary care urogynecology practice from January 2001 to March 2004. Irritative voiding symptoms were defined as urgency, urge incontinence, frequency, dysuria, and/or nocturia. Subjects were excluded if they had a history of a gynecologic or urothelial malignancy, kidney transplant, dialysis, or gross hematuria. Patients were also excluded if they were diagnosed with a urinary tract infection.

Data regarding patient demographics, symptoms, risk factors for urothelial cancer, presence of microscopic hematuria, urodynamic findings, and cystoscopy results were collected from a computerized medical record system and hospital charts. Microscopic hematuria was defined as any hematuria on urine dipstick. All cystoscopies were performed in an outpatient setting in the Division of Urogynecology. Before cystoscopy, lidocaine gel was administered into the urethra for anesthesia. Urethroscopy was performed with a 12-degree rigid endoscope, which was followed by cystoscopy using a 70-degree endoscope. If a suspicious lesion was detected at cystoscopy, cytologic washings were sent

Table II Biopsy results of suspicious lesions diagnosed during cystoscopy

Diagnosis	n (% of total)
Benign epithelium	4 (0.6)
Squamous metaplasia	7 (1.0)
Chronic cystitis	9 (1.2)
Cystitis cystica	5 (0.7)
Cystitis glandularis	3 (0.4)
Papillary neoplasm of low malignant potential	2 (0.3)*
Transitional cell carcinoma	1 (0.1)*

* Cytologic specimen showed no malignant cells.

for analysis and a cystoscopically directed biopsy was obtained.

Statistical analysis was performed with SPSS 12.0 (SPSS, Inc, Chicago, IL). Chi-square and Fisher exact test were used for dichotomous variables and Student *t* test was used for continuous variables. A *P* value < .05 was considered statistically significant. Odds ratios (OR) and 95% CIs for variables associated with bladder cancer were calculated using multivariate logistic regression.

Results

A total of 749 subjects met the inclusion criteria; however, 14 cases were excluded secondary to missing data regarding hematuria. Ultimately, 735 subjects were included in the final analysis. Of these 735 patients with irritative voiding symptoms, 264 (35.9%) women with microscopic hematuria defined our cases, and the remaining 471 (64.1%) without microscopic hematuria represented our control group. There was no difference in mean age between the microscopic hematuria and no hematuria groups (58.0 ± 15.3 vs 56.4 ± 15.1, *P* = .18, respectively). The 2 groups were also similar in race, parity, tobacco use, and family history of bladder cancer (Table I). The only difference was that the group with microscopic hematuria had a higher body mass index (30.5 ± 7.9 vs 29.0 ± 6.7, *P* = .01).

During cystoscopy, 31 suspicious lesions were detected, which required cytology and biopsy. The biopsy results are listed in Table II. Three bladder cancers were detected (2 papillary neoplasms of low malignant potential and 1 low grade, noninvasive transitional cell carcinoma) for an overall bladder cancer rate of 0.4%. The cytologic washings in these 3 cases of malignancy were all negative for malignant cells.

Microscopic hematuria was not associated with bladder cancer, as it was absent in 2 of the 3 cases. Fisher exact tests and logistic regression analysis also revealed no association between bladder cancer and the following independent variables: age, urgency, urge incontinence,

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