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Should Antibiotics Be Given Prior to Outpatient Cystoscopy? A Plea to Urologists to Practice Antibiotic Stewardship

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Abstract

Background: Antimicrobial resistance is a major health problem, caused primarily by overuse of antibiotics in clinical situations in which they are not necessary. Practice guidelines recommend that antibiotics be given before outpatient cystoscopy to prevent symptomatic urinary tract infection (UTI).
Objective: To determine the frequency of febrile UTI after outpatient flexible cystoscopy in antibiotic-naive bladder tumor patients.
Design, setting, and participants: A total of 2010 consecutive outpatients with bladder tumors were entered into a prospective registry study. All patients underwent cystoscopy after they submitted a voided urine sample for culture. Significant bacteriuria was defined as $>10^4$ colony-forming units per milliliter with a single organism. Patients were stratified for known risk factors for UTI.
Intervention: Patients underwent flexible cystoscopy and received no antibiotics immediately before or after cystoscopy. They were followed for 30 d for onset of febrile UTI.
Outcome measurements and statistical analysis: The end point was incidence of febrile UTI within 30 d of cystoscopy. *Febrile UTI* was defined as temperature >38 °C and dysuria, or having received antibiotics from an outside physician for urinary symptoms.
Results and limitations: Of the 2010 patient cystoscopies, 489 (24%) had asymptomatic bacteriuria, and 1521 (76%) had sterile urine. Thirty-nine patients (1.9%) developed febrile UTI ≤30 d after cystoscopy—4.5% in colonized patients and 1.1% in uninfected patients ($p = 0.02$). All UTIs resolved in ≤12–24 h with oral antibiotics. None of the patients was admitted for bacterial sepsis. Limitations of the study are that it is a single-surgeon experience in one institution, and results may not apply to other patient populations.
Conclusions: Antibacterial therapy before outpatient flexible cystoscopy does not appear necessary in bladder tumor patients who have no clinical signs or symptoms of acute UTI, including asymptomatic bacteriuria. Antibiotic stewardship is the responsibility of all urologists.

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1. Introduction

Outpatient flexible cystoscopy is an essential procedure to diagnose and follow patients with bladder tumors. Although cystoscopy is minimally invasive, it may cause urinary tract infection (UTI) in ≤10% of patients [1]. Practice guidelines suggest antibacterial prophylaxis before cystoscopy in patients who are at risk [2]. Risk factors for UTI include advanced age, smoking, anatomic anomalies, steroid use, diminished immune function, and urethral catheters. Since the majority of bladder cancer (BCa) patients have one or more of these risk factors, antibiotics are usually given

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before each outpatient cystoscopy. The downside of such practice is that asymptomatic bacteriuria is common in adults and generally does not require treatment [3]. Overuse of antibiotics prior to cystoscopy may contribute to the worldwide rise of multidrug bacterial resistance [4].

We find that ≤25% of ambulatory bladder tumor patients have asymptomatic bacteriuria [5]. Some studies show that antibiotics reduce the frequency of UTIs compared with placebo [6,7], whereas others suggest that there is no benefit to routine antibiotics because the risk of serious UTI is low [8–12]. Our policy is not to obtain urine cultures or use prophylactic antibiotics before outpatient flexible cystoscopy in asymptomatic individuals. To validate or refute this policy, we investigated the incidence of symptomatic UTIs following cystoscopy in antibiotic-naive infected and uninfected BCa patients.

2. Materials and methods

A total of 2010 outpatient flexible cystoscopies were performed in 895 patients with bladder tumors enrolled in an institutional review board–approved study between May 2010 and May 2013. None of the patients was febrile or had symptoms of a UTI. The patients had not received antibiotics within a month before the procedure. Patients were stratified by smoking status and risk factors for UTI. Pregnant females were deemed ineligible; however, patients with artificial joints or heart valves were included.

Immediately before undergoing cystoscopy, each patient submitted a voided urine specimen for bacteriologic studies. Urine culture was classified as no growth or $>10^4$ colony-forming units (CFU) per milliliter with a single organism, defined as significant bacteriuria. Antibiotics were not given immediately before or after cystoscopy.

Cystoscopy was performed with the patient in the dorsolithotomy position. The genitalia were washed with a povidone–iodine solution. In males, 10 ml of 2% lidocaine jelly, which did not contain an antibacterial substance, was instilled into the urethra. However, the gel used to lubricate the instrument contained chlorhexidine, which is bacteriostatic. A 15F flexible digital cystoscope was atraumatically inserted into the bladder. Small recurrent papillary tumors were fulgurated using a 4F Bugbee electrode diathermy generator set at 8–10 W. The procedure length averaged approximately 5–10 min. Cystoscopes were sterilized by manual scrubbing and ultrasonic washing using Tergal 800 detergent, followed by exposure to Cidex and rinsing.

After the procedure, the patients were given a fact card with instructions to call if they had dysuria and a temperature ≥38 °C. A nurse called patients at least once the week after the procedures, and more often if they had dysuria. The end point was occurrence of febrile UTI ≤30 d after cystoscopy. Febrile UTI included patients who complained of dysuria and received antibiotics from a local physician, even if a urine culture was not done to document infection. Patient data were collected prospectively and updated weekly.

Febrile UTIs occur after flexible cystoscopy in 3–6% of patients who have sterile urine [13]. With a sample size of 2000 patients, including 1 in every 4 or 5 patients who have bacteriuria, we hypothesized that <5% of colonized and uninfected patients who did not receive antibiotics would develop a febrile UTI in ≤30 d. The chi-square test was used to correlate patient characteristics with the frequency of UTI. A multivariate analysis was done to identify risk factors associated with developing UTI in the antibiotic-naive population. All tests were two-sided. A p value <0.05 was considered significant.

3. Results

Table 1 shows patient characteristics and results. For purposes of analysis, each cystoscopy was regarded as an independent event (ie, 2010 patient cystoscopies). A total of 380 patients had 1 cystoscopy, and 515 patients underwent 2–10 cystoscopies. Of the 2010 patients, 489 (24%) had significant bacteriuria. Cultures revealed *Escherichia coli* in 201 patients (41%), enterococci in 156 patients (32%), and staphylococci in 65 patients (13%); 67 patients (14%) had *Klebsiella, Gardnerella, Proteus, Bacteroides*, or *Pseudomonas* species. Infected patients tended to be older and female. Other known risk factors for UTI, such as smoking, lower urinary tract symptoms owing to enlarged prostate, immunosuppression, and diabetes were distributed equally between culture-positive and culture-negative patients.

Thirty-nine patients (1.9%) developed febrile UTI ≤30 d after undergoing cystoscopy; 17 of 1521 patients (1.1%) had no growth on urine culture, and 22 of 489 patients (4.5%) had asymptomatic bacteriuria ($p = 0.02$). Of the latter patients, only three cases of UTI developed in individuals with $>10^4$ CFU/ml; the majority occurred with a $>10^5$ CFU/ml bacterial load. The majority of UTIs (29 patients) occurred in a few days to a week after cystoscopy. In each case, patients received 5–7 d of a broad-spectrum antibiotic, and UTIs resolved in ≤12–24 h. None of the patients was admitted to a hospital. None of the patients had more than one UTI, even among patients having multiple cystoscopies. Multivariate analysis (Table 2) shows that only older age (>65 yr) and bacteriuria were significantly associated with developing a febrile UTI. None of the other risk factors was significant, including tumor fulguration, cystoscopy after BCG therapy, bacterial load, or organism type.

Table 1 – Characteristics of 2010 patient cystoscopies by presence or absence of bacteriuria

Variable	No growth	$>10^4$ CFU/ml	p value*
Patient cystoscopies, no. (%)	1521 (76)	489 (24)	
Patients fulgurated, no. (%)	137 (9)	49 (10)	0.17
Cystoscopy after BCG, no. (%)			
Yes	270 (78)	73 (21)	
No	1251 (75)	416 (25)	0.15
Age, yr, median (range)	68 (37–100)	74 (37–102)	0.03
Males, no. (%)	1196 (80)	299 (20)	0.001
Prior/current smoker, no. (%)	1079 (71)	362 (74)	0.12
Increased risk for UTI,** no. (%)			
Female	325 (63)	190 (37)	0.001#
Diabetes	91 (6)	39 (8)	0.44
BPH	251 (21)	78 (26)	0.09
>65 yr	1019 (67)	347 (71)	0.12
Immunosuppressed	15 (1)	7 (1.4)	0.19
Catheter	21 (1.2)	8 (1.5)	0.15
Febrile UTI, no. (%)	17 (1.1)	22 (4.5)	0.02

CFU = colony-forming unit; BCG = bacillus Calmette-Guérin; UTI = urinary tract infection; BPH = benign prostatic hyperplasia.
* Pearson chi-square test.
** UTI, febrile UTI.
# Relative to males.