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ONCOLOGY/RECONSTRUCTION
MINI-REVIEW

Cystoscopy and intravesical bacille Calmette–Guérin therapy in antibiotic-naïve patients with bladder cancer with asymptomatic bacteriuria: An update

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KEYWORDS

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Abstract Urologists often insist on sterile urine before invasive outpatient urological procedures, and urine culture and antibiotics are usually given before cystoscopy or instillation of bacille Calmette–Guérin (BCG) therapy, especially in patients who have positive urine cultures. Our experience suggests that cystoscopy and induction BCG therapy can be performed safely, even in patients with asymptomatic bacteriuria, without pretreatment or prophylactic antibiotics. The rate of subsequent febrile urinary tract infection is <4% in both infected and uninfected patients. Pretreatment antibacterial therapy does not appear to be necessary before these two outpatient urological procedures in patients with bladder cancer. Such strategy facilitates timely interventions and reduces the possibility of antibiotic resistance.

Introduction

Cystoscopy is the most frequent procedure performed by urologists. Intravesical instillation of BCG therapy is also a common urological procedure. Patients with bladder tumours undergo frequent cystoscopy and many receive intravesical BCG therapy. Many urologists consider that cystoscopy and BCG therapy should be performed only in patients with sterile urine [1].

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However, a significant proportion of patients with bladder tumours have asymptomatic bacteriuria. Many urologists give prophylactic antibiotics before and after such procedures, aiming to prevent acute UTI or bacterial sepsis.

We challenge that view because overuse of antibiotics has led to a rapid rise in antimicrobial bacterial resistance, especially in urology outpatients [2]. In this review, we update our experience in antibiotic-naïve patients with bladder tumours who undergo outpatient flexible cystoscopy or intravesical BCG therapy.

Patients and methods

Patients with bladder cancer have their clinical information entered in prospective Institutional Review Board-approved databases. We identified consecutive patients with bladder tumours who underwent cystoscopy or received induction BCG therapy since 2009. No patient was febrile or had symptoms of acute UTI, and they were not taking antibiotics. Minor or moderate LUTS were common; however, attributed to bladder tumour, enlarged prostate, or treatments. Immediately before undergoing cystoscopy or start of BCG therapy, each patient submitted clean-catch voided urine samples for bacteriological studies. Urine cultures were classified as negative (no growth or mixed flora) or positive ($>10^4$ or $>10^5$ colony-forming units/mL with a single isolated organism). Positive culture counts identified patients as having asymptomatic bacteriuria.

Patients underwent outpatient flexible cystoscopy (including fulguration of small tumours) and intravesical BCG using sterile techniques previously described [3]. After each procedure, patients were given a fact card with instructions to telephone if they had dysuria or a temperature of $\geqslant 38$ °C, followed by nurse telephone calls for a week and up to a month to record infectious complications. UTI was defined as a fever of $\geqslant 38$ °C, moderate to severe dysuria, and a positive urine culture at $\leqslant 30$ days of cystoscopy or last BCG treatment. Febrile UTI also included antibiotics prescribed by other physicians, even if follow-up urine culture was not obtained.

Results

In all, 3180 outpatient flexible cystoscopies were evaluated and 440 patients received induction (six weekly doses) BCG therapy. None had antibiotics before or after procedures. The median (range) age was 70 (22–102) years, and 76% were men. Table 1 shows the results. Of 3180 patient cystoscopies, 22% had asymptomatic bacteriuria compared with 30% of 440 patients undergoing induction BCG therapy. In all, 65 patients (2%) developed a febrile UTI after cystoscopy (3.4% in infected vs 1.7% in uninfected patients), whilst 12 patients (2.7%) had a symptomatic UTI during or after weekly BCG therapy (0.8% with asymptomatic bacteriuria vs 3.6% in uninfected patients). The most common infecting organisms were *E. coli* and *Enterococcus* followed by *Staphylococcus* species. All UTIs resolved with culture-sensitive oral antibiotics within 12–24 h. One patient with asymptomatic bacteriuria was admitted to hospital overnight for observation when he complained of difficulty in urinating, fever and chills after his fifth dose of BCG, and was discharged the next morning on oral antibiotics. None of the patients who had tumours fulgurated (to date) developed a UTI.

Table 1 Incidence of UTI after urological procedures in patients with bladder tumours with asymptomatic bacteriuria.

Procedure	Patient-cystoscopy, *n* (%)	UTI, *n* (%)	*P*[*]
Cystoscopy	3180	65 (2)	0.004
ABU	707 (22)	24 (3.4)	
NG	2473 (78)	41 (1.7)	
BCG therapy	440	12 (2.7)	0.001
ABU	131 (30)	1 (0.8)	
NG	309 (70)	11 (3.6)	

ABU, asymptomatic bacteriuria; NG, no growth in urine culture.
[*] Pearson chi-squared test.

Discussion

Our updated experience confirms that bacteriuric patients with bladder tumour were able to safely undergo two common outpatient urological interventions, namely cystoscopy and BCG instillation, and not require pretreatment antimicrobial therapy to sterilise the urine. Although symptomatic UTI after cystoscopy in patients with asymptomatic bacteriuria was more common than in uninfected patients, the incidence was $<4\%$. This is not significant clinically to justify routine antibiotics in all such patients, especially as UTIs appear to resolve quickly with appropriate oral antibiotics [4]. The caveat is close follow-up of compliant patients is required.

On the other hand, febrile UTI developed in only one bacteriuric patient (0.8%) during BCG therapy compared with 3.6% in uninfected patients. This paradoxical finding is consistent with prior observation that intravesical BCG in fact may help eradicate bacteria in the urine [5].

Our studies have weaknesses. They represent patients referred to a tertiary cancer centre, and the population, and our methods may not be translated to other populations who may present unique or greater risks for serious UTIs, even after common urological procedures. Our surgery and follow-up methods may not be possible in some settings. We relied significantly on patient self-reporting, which may underestimate the true incidence of serious infections, although we consider this unlikely, as patients generally return regularly as part of their

cancer care. Other prospective studies are necessary to corroborate our experience.

Conclusion

Asymptomatic bacteriuria is common in patients with bladder cancer undergoing outpatient cystoscopy or induction BCG therapy. Routine antimicrobial prophylaxis seems unnecessary, even in asymptomatic infected patients, because clinically significant UTIs are uncommon and easily treated. Avoiding indiscriminate use of antibiotics in such cases facilitates timely interventions and reduces bacterial resistance [6]. Studies to reduce antibiotic exposure in other commonly performed outpatient urological procedures, such as cystogram, removal of indwelling urethral catheter (i.e. after radical prostatectomy), urodynamic testing, removal of ureteric stents, and fulguration of small papillary tumours, are warranted.

Conflicts of interest

None declared.

Source of Funding

None.

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