

Compare Frequency of Symptomatic Pyuria in Patients Undergoing Flexible Cystoscopy with or without Antibiotic Prophylaxis

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ABSTRACT

Cystoscopy is one of the most commonly performed urological procedures with purpose to inspect lower urinary tract anatomy and evaluation of lower urinary tract symptoms as well as various pathologies of the urethra, prostate and bladder. The procedure is carried out by inserting an optical instrument (cystoscope) into the urethra and the bladder. Currently, no antibiotic prophylaxis has been recommended for routine flexible cystoscopy, except in high risk patients. The patients in our population undergoing cystoscopy belonged to two groups. One was given prophylactic antibiotic dose of Fosfomycin per orally while other received placebo and frequency of pyuria was seen at 10th day.

Objective: To compare frequency of symptomatic pyuria in patients undergoing flexible cystoscopy with or without antibiotic prophylaxis.

Material and Methods: Patients were divided into two groups. Group – 1 with Antibiotic prophylaxis while Group – 2 with placebo. All surgeries will be performed by a consultant urologist and were assisted by principal investigator. The frequency of symptomatic pyuria was calculated.

Data analysis: Collected data was analyzed on SPSS version 16. Descriptive statistics was calculated for both qualitative and quantitative variables. For qualitative variables like gender frequency percentages were calculated. For quantitative variables like age, operation time mean \pm SD were calculated. Effect modifiers like age, gender, duration of symptoms were controlled by stratification. Post stratification independent sample t-test was applied keeping p-value \leq 0.05 as significant.

Results: A chi-square test indicates there was no significant difference in the proportion of symptomatic pyuria (21.9%) as compared with the value of 27.7% in placebo group ($\chi^2=1.695$, $n = 382$ $p = 0.193$). This supported our null hypothesis stating that there is no difference in symptomatic pyuria between antibiotic prophylaxis group vs placebo group.

Conclusion: There was no significant effect on symptomatic pyuria with or without antibiotic prophylaxis.

Keywords: cystoscopy, pyuria, antibiotic prophylaxis, UTI

INTRODUCTION

Cystoscopy is defined as endoscopy of the urinary bladder through the urethra by employing either a rigid or a flexible cystoscope which may be performed for either diagnostic or therapeutic purposes. The first instrument used for visualizing the body from inside was developed by Philipp Bozzini (1773-1809), a German army surgeon, who invented the Lichtleiter (the ancestor of modern endoscopes) in 1807. Bozzini used this innovation for viewing the bullets in his patients.¹ The cystourethroscope has seen great innovation by the introduction of cold light, the enhancement of the optical system, and the development of videoendoscopy, flexible instruments, and virtual endoscopy.^{2,3}

Cystoscopy was classically done using rigid scope and often requiring general anesthesia or sedation especially in male patients. The improvement in the equipment and technique of endourological procedures have made them safer more efficient and cost-effective.¹ Cystoscopy is one of the most commonly performed urological procedures with purpose to inspect lower urinary tract anatomy and evaluation of lower urinary tract symptoms as well as various pathologies of the urethra, prostate and bladder. The procedure is carried out by inserting an optical instrument (cystoscope) into the urethra and the bladder. The first flexible cystoscopy was done in 1981 by Wilbur using flexible choledochoscope and now flexible cystoscope is used widely in many center. Flexible cystoscopy is a commonly performed diagnostic and therapeutic procedure usually carried out under local anesthesia.² Flexible cystoscope plays a vital role in urological examinations. It is a basic technique routinely in use in the field of urology because it allows direct examination of the lesions and for taking tissue samples when required. There are multiple denotements for the procedure like hematuria, lower urinary tract symptoms evaluation, urothelial cancer follow up, peregrine body retrieval, orchestrating a surgery, etc.⁵ It is however consequential to descry its risks to obviate future complications. Pain, hematuria, lower urinary tract symptoms and urinary tract infection are the main deleterious effects presenting during or after the procedure. These symptoms are associated with

higher morbidity in patients and increment the cost for healthcare system.⁷⁻⁹

The main and most concerning disadvantage of cystoscopy is the peril of urinary tract infection (UTI) due to pre-substituting colonisation or by prelude of bacteria at the time of the procedure, even with opportune peri-procedural preparation.¹³ According to García-Perdomo et al.¹⁰ in Latin America, hematuria and urinary tract infection (UTI) incidences are 1% and 1.8% respectively, others like Jimenez-Cruz et al. (11) found 10% of UTI incidence in Spain, but it could vary between 1 and 21% according to literature^{10,11,12}. The most frequently implicated uropathogens in post-cystoscopy UTI are *Escherichia coli* (*E. coli*) (58%), *Klebsiella* (8.8%), and *Enterococcus* (17.6%).¹⁴ Urinary tract infection symptoms reflect an inflammatory replication of the urothelium to bacterial incursion, which is associated with bacteriuria and pyuria (pus in the urine). Bacteriuria can be asymptomatic or symptomatic, which describes the absence or presence of symptoms such as pyrexia, dysuria, frequency and suprapubic pain¹³. The incidence of asymptomatic bacteriuria after cystoscopy ranges from 2.8% to 21%¹⁴. In contrast, symptomatic UTI is less prevalent after cystoscopy¹⁵. Whether antimicrobial agents should be habituated to obviate a less than five per cent average risk of symptomatic UTI after cystoscopy is controversial^{14,15,16}.

There are studies on UTI in an ambulatory and hospital settings, identifying it as the most mundane nosocomial infection nowadays¹⁷. Experimental studies have demonstrated the prophylaxis antibiotic's efficacy to obviate surgical site infection and UTI in surgical settings¹⁸⁻¹⁹. According to urological guidelines, it is not obligatory to utilize antibiotics in procedures like cystoscopy, urodynamics and cystography in patients with sterile urine. In others, like aged patients, anomalies of the urinary tract, poor alimental status, cigarette smoking, immunosuppression, external catheters, instrumentation of urinary tract and bacteriuria, the prophylaxis is recommended²⁰⁻²³.

Urinary tract infection (UTI) after cystoscopic procedures has a reported incidence ranging from 2.7–35%, of which 10–16% patients can go on to develop septicaemia²⁴⁻²⁸. Given the jeopardy of UTI, the utilization of prophylactic antibiotics prior to flexible

cystoscopy (FC) has been suggested; however, ancillary evidence has been inconclusive. Systematic reviews have generally concentrated on the evidence for all transurethral procedures and not concretely for FC^{26,29}. An antecedent systematic review summarised bacteriuria outcomes for FC among other procedures³⁰. However, the review did not include two recent RCTs published after their search date and a supplemental sizably voluminous RCT that was indited in Spanish³¹⁻³³. At present, albeit the European Urology Guide⁵ only recommended antibiotic prophylaxis in high - risk patients, the protocols at each hospital are different and still making prophylaxis to reduce the peril of bacteriuria and there are even studies that verbally express the utilization of antibiotics obviates or reduces bacteriuria²⁶. The lack of an exhaustive and contemporary systemic review is reflected in the absence of robust guidelines regarding prophylactic antibiotic use. The American Urological Sodality states that patients should receive prophylactic antibiotics in FC only if they have paramount risk factors affecting their replication to surgical infections³⁴. The European Urological Sodality does not recommend antibiotic use in standard FC, but does recommend considering antibiotics prophylaxis in high-risk patients.³⁵

Currently there is no evidence to suggest antibiotic prophylaxis afore cystoscopy due to a substantial amount of studies, heterogeneous, clinical and methodologically. The aim of this systematic review (SR) and meta-analysis (MA) was to estimate the efficacy of antibiotic prophylaxis to avert urinary tract infection in patients who undergo a cystoscopy with sterile urine. Regarding the utilization of an- tibiotic prophylaxis, two recent reviews apperceived that there is low-moderate scientific evidence that lead us to the option of not giving prophylactic antibiotic treatment, albeit they mention that more well-designed studies are required to compare the utilization of antibiotic prophylaxis against not utilizing it^{36,37}. Variants of antibiotics have been utilized in the prophylaxis of out patient procedures such as cystoscopy. These include quinolones that, albeit some authors bulwark their utilization in decrementing bacteriuria and urinary infection^{38,39}, this point must be demystified, as we have aforesaid visually perceived in recent reviews^{36,37}. As can be visually perceived from the current scientific evidence and from conventional clinical practice, there are no protocols on the utilization or not of antibiotic prophylaxis in flexible cystoscopy, nor is there a consensus on whether or not it is opportune. There is level Ib, III, and IV evidence to suggest that antibiotic prophylaxis afore simple cystourethroscopy should be administered only in the presence of peril factors for UTI, such as advanced age, anatomic anomalies of the urinary tract, poor alimantal status, smoking, long-term corticosteroid use, immunodeficiency, fine-tuned catheters, coexisting infection, and perpetuated hospitalization.²⁰⁻²⁸

For those who have any of these risk factors, the recommended antibiotic prophylaxis includes a single dose of either a fluoroquinolone or trimethoprim-sulfamethoxazole. Alternatively, an aminoglycoside (with or without ampicillin), a first- or second-generation cephalosporin, or amoxicillin-clavulanate may be given. Patients with negative urine cultures and those without any of these risk factors do not require antibiotic prophylaxis afore cystourethroscopy^{33,34}.

The above recommendations hold true for simple cystourethroscopy; however, all patients who are scheduled to undergo cystourethroscopy with manipulations should receive antibiotic prophylaxis.³⁵ According to the American Heart Sodality (AHA), antimicrobials are no longer recommended solely to avert infectious endocarditis in sodality with genitourinary procedures.³⁶ The justification for this study is predicated mainly on this, in the interest that it con- encomiums to incrementing the scientific evidence on whether there is a desideratum or not to give antibiotic prophylaxis. The interest of this study is that is a clinical study without intervention, but with a well-designed method in clinical habitual practice comparing two antibiotic prophylaxis with no prophylaxis.

As we have antecedently commented, albeit the clinical guide of the European Sodality of Urology²⁵ currently recommends the utilization of antibiotic prophylaxis in high-risk patients (diabetics, immunosuppressed), antibiotic prophylaxis is still used arbitrarily in the different hospitals where this is carried out. Urinary infection and the presence of bacteriuria are infrequent after flexible cystoscopy²⁷ and there is a low incidence of bacteriuria²⁸, despite which, different authors analyze the role of antibiotic prophylaxis in the performance of this procedure. In this study we will compare the incidence of pyuria in patients undergoing cystoscopy with prophylactic antibiotic dosing or those without the prophylactic dose. The main objective of the study was to compare frequency of symptomatic pyuria in patients undergoing flexible cystoscopy with or without antibiotic prophylaxis.

Hypothesis, Null Hypothesis: There is no difference in frequency of symptomatic pyuria in patients undergoing flexible cystoscopy with or without antibiotic prophylaxis.

Alternative Hypothesis: Frequency of symptomatic pyuria is lower in patients undergoing flexible cystoscopy with versus without antibiotic prophylaxis.

MATERIAL AND METHODS

Randomized Control Trial was used as study design. This study was conducted in Pakistan Kidney and Liver Institute, Lahore. Duration of study from July, 2021 to January 2022.

Sample size was calculated by using WHO sample size calculator taking level of significance as 5%. Power of test 90%, anticipated population proportion P1 is equal to 0.2335, anticipated population proportion mean is 0.375. Sample size is equal to minimum 382 patients having 191 patients in each group. We conducted the study on 382 patients with 191 in each group. The sample was selected by using the consecutive (non-probability) sampling technique.

Sample Selection

Inclusion criteria:-

- All adult patients (18 to 80 years)
- Patients undergoing flexible cystoscopy.

Exclusion Criteria:

- Patients having bleeding disorders (having deranged PT/APTT, Platelets<50,000/ml) due to bleeding risk during surgery.
- Patients having positive urine cultures (on urine culture examination) due to risk of urosepsis.
- Patient requiring therapeutic procedures during flexible cystoscopy.
- Patient undergoing intravesical therapy
- Patients with known sensitivity to fosfomycin.
- Patients not willing for the procedure
- Patients who did not give consent for inclusion in study.

Data collection Procedure:

- Ethical approval for the study was sought from ethical committee Pakistan Kidney and Liver Institute, Lahore. After explaining the purpose of the study, informed consent was obtained from the patients for participating in the study.
- All the patients diagnosed to have indication for flexible cystoscopy.
- Routine investigations including complete blood count, PT/APTT, renal function tests, serum electrolytes, urine culture were done in Shifa international hospital laboratory.
- Informed consent was taken from all patients regarding use of their information related to the procedure for use in this research study.
- The patients were divided into two groups by lottery method.
 - Group A (1)patients underwent antibiotic prophylaxis(3 grams single dose of oral fosfomycin sachet 30minutes before flexible cystoscopy).
 - Group B (2) included patients who received placebo(3 grams placebo 30 minutes before flexible cystoscopy in a glass of water).

All surgeries were performed by consultant urology and were assisted by principal investigator. The frequency of symptomatic pyuria was calculated by the chief investigator.

- The outcome was noted on day 10 with fresh urine routine examination. Patient is labelled positive if he had Episodes of burning micturition, suprapubic and urethral pain during voiding along with more than 10 WBCs on urine analysis within ten days of flexible cystoscopy. Patient could present early if he developed symptoms.
- All the data was collected from the patients and was entered on the pro-forma (annexed).

Data was analyzed on SPSS version 16. Descriptive statistics were calculated for both qualitative and quantitative variables.

For qualitative variables like gender, duration of symptoms, frequency percentage was calculated. For quantitative variable like age, means + SD was calculated.

Chi square test was used to compare pyuria in patients undergoing antibiotic prophylaxis vs no prophylaxis.

Effect modifiers like age, gender, duration of symptoms were controlled by stratification. Post stratification Chi square test was applied. P value less than or equal to 0.05 was taken significant.

The outcome measure was presence or absence of symptomatic pyuria. Chi square test was used to compare pyuria in patients undergoing antibiotic prophylaxis vs no prophylaxis

RESULTS

A total of 382 patients were included in study, 191 patients in each group.

Patient’s Profile Prior To Treatment

Frequency: From, 382 consecutive indoor patients were enrolled on a convenient sampling bases. In 191 patients antibiotic prophylaxis was given (Group 1), and in 191 patients no antibiotic prophylaxis was given (Group 2).The division of the patients is shown in the Table I.

Table 1: Trail Profile

Groups	No. Of Patients	Lost in Follow-up	Total (n)
Antibiotic prophylaxis (Group A (1))	191	0	191
No Antibiotic prophylaxis (Group B (2))	191	0	191
Total	382	00	382

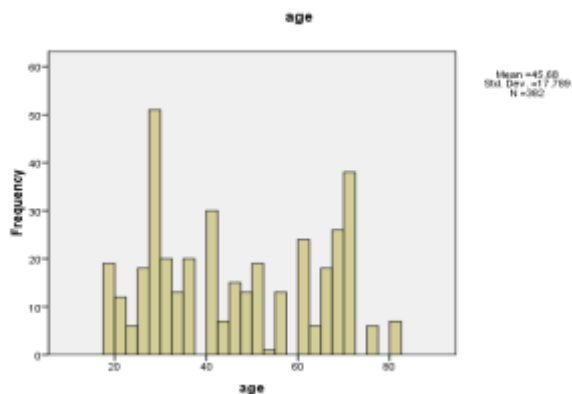


Figure 1: Age distribution of the Trail population

Age Incidence: Our study population was in age group of 18 to 80 years. Mean age of patients in our study was **45.68** years+/-17.78 with 53.33% patients below the age of 45years. The age distribution of the patients in shown in figure 1.

Gender: In our study, 240 patients (62.8%) were males and 142 patients (37.2%) were females (n=382). The stone site distribution is shown in the Figure

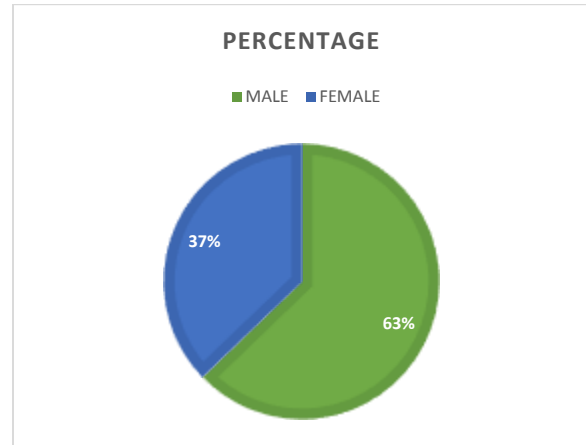


Fig 2: Gender Distribution

Table 2: Gender Distribution In Each Group

	Gender	
	Male	Female
Antibiotic prophylaxis a (1)	115	76
Placebo group b (2)	125	66

Duration of Symptoms: The mean duration of symptoms was **1.089+/-0.57days**. The histogram for stone size is shown below.

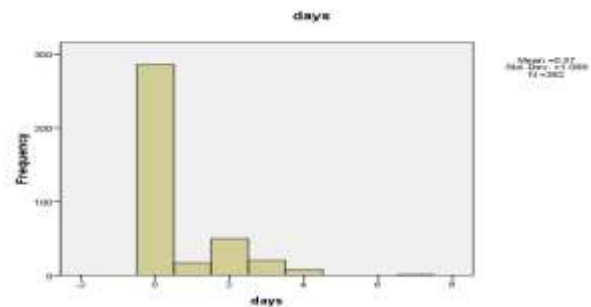


Fig 3: Duration Of Symptoms

Table 3: Outcome Of Treatment

Treatment group	Frequency of pyuria
Antibiotic prophylaxis (group a 1) N=191	42
Placebo group (group b 2) N=191	53

(P<0.001)

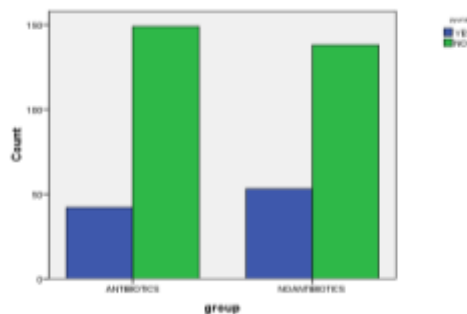


Figure 3: Comparison Of Two Groups In Terms Of Frequency Of Pyuria

A chi-square test indicates there was no significant difference in the proportion of symptomatic pyuria (21.9%) as compared with the value of 27.7% in placebo group ($\chi^2=1.695$, $n=382$, $p=0.193$). This supported our null hypothesis stating that there is no difference in symptomatic pyuria between antibiotic prophylaxis group vs placebo group.

DISCUSSION

The most frequent microorganisms causing UTI ecumenical are *E. coli*, *Enterococcus* spp, *Proteus* spp. and *Klebsiella* spp.^{8, 9} Antimicrobial prophylaxis is a brief course of administration of antibiotics aforesaid intervention, intended to minimize the peril of post-procedural infections resulting from diagnostic and therapeutic interventions. Fluoroquinolones, cephalosporins, and aminoglycosides are generally considered as efficacious and ideal antibiotics for prophylaxis praxis in the urinary tract³⁴. Patients with risk factors, i.e. advanced age, anatomic anomalies of the urinary tract, poor alimental status, smoking, chronic corticosteroid use and immunodeficiency are reported to be inclined to suffer from UTI after transurethral procedures.²⁶ As a result, practice guidelines of American Urological Sodality (AUA) and European Sodality of Urology (EAU) both recommend that antibiotic prophylaxis should be considered for patients with high-risk factors undergoing cystoscopy⁵⁴. Since the majority of bladder cancer patients have one or more of these risk factors, antibiotics are conventionally given aforesaid each outpatient cystoscopy^{15,62}. However, nonessential antimicrobial prophylaxis should be evaded, overuse of antibiotics prior to cystoscopy may contribute to unpropitious effect and multidrug bacterial resistance^{22,36}. Antibiotics are associated with deleterious effects, including nausea, emesis, diarrhoea, headache, delirium, hallucinations, convulsions, rash, and pruritus, etc³⁴. Meanwhile, given the numerous cystoscopies performed every year around the world, and patients with bladder tumours need to undergo perpetual cystoscopy for surveillance, there are concerns about the development of antibiotic-resistant bacteria when routine antimicrobial prophylaxis is utilized^{62,63}. For example, for ciprofloxacin, the most widely used antibiotic aforesaid urological procedures for obviating UTI, resistant infections are reported to be more than 30%^{23,29}.

Antecedent studies have shown that a single dose of prophylactic antibiotic can significantly reduce the peril of bacteriuria after cystoscopy³⁸. Johnson 2007 withal suggested that one dose of oral antibiotic could not only lower costs, but withal reduce the perils of drug resistance.³⁸ In contrast, Garcia-Perdomo^{16,31,61} found prophylactic antibiotic could not significantly reduce UTI of patients undergoing cystoscopy compared with placebo. Even for patients with asymptomatic bacteriuria aforesaid cystoscopy, the rate of post-cystoscopic symptomatic UTI is just 3.7% (63). Herr 2014 betokened that urologists may need to accept a less than five per cent risk of symptomatic UTI after cystoscopy and eschew routine antibiotic prophylaxis, which may avail to reduce the percentage of resistant bacteria. Antimicrobial prophylaxis should be recommended in clinical practice when the potential benefit outweighs the jeopardies and anticipated costs. Injudicious utilization of the antibiotics may cause deleterious effects, as well as multidrug bacterial resistance, result in treatment failure and increment healthcare costs. At the present, we are facing an epidemic of bacterial resistance due to overuse of antibiotics, with the susceptibility rates of antibiotics to *E.coli* ranging from about 60% to proximately 70% (cefuroxime 67.8% to 86.4%, ciprofloxacin 61.2% to 69.8% and co-trimoxazole 55.0% to 65.5%)^{23,37,51}. To preserve the perpetuated antibacterial activity of these antibiotic drugs, urologists need to ascertain that antibiotic prophylaxis is given to patients who in fact need to be treated.

Antibiotic susceptibility profiles of these microorganisms were not assessed since the urine culture reports emanated from different laboratories. It was found that the group of patients with initial asymptomatic bacteriuria was at a higher risk for persisting with it than the jeopardy of the group of patients with sterile urine of

developing it following cystoscopy. With regard to UTI peril, group 1 was not statistically different when compared with group 2. For urosepsis we did not find statistically paramount sodalities either. We could not determine if patients who were askance of urosepsis presented to a hospital elsewhere and were assessed and treated. Despite the complications secondary to cystoscopy, such as hematuria, storage LUTS (mainly urinary retention) and bladder perforation, only three cases of gross hematuria were present, accounting for 3.4% of all patients, which is in accord with the reported in the literature (around 3%)²⁸. Pain after cystoscopy and adverse events to antibiotics were not studied. A pertinent circumscription of this study was the low number of patients of group 1 as we had a considerable quandary recruiting patients with asymptomatic bacteriuria who were candidates for cystoscopy because most of them preferred being first treated than undergoing the procedure under antibiotic treatment. Bacteriuria incidence associated with indwelling catheterization is 3%-8% per day, consequently virtually all patients with an indwelling catheter are bacteriuric by one month^{42,43}. Patients attending urology accommodations and undergoing cystoscopy are frequently catheterized and hence colonized without obligatorily having repercussion in their health. However, being colonized is a contraindication to performing cystoscopy and treatment sometimes does not assure obtaining a negative urine culture. Patients may not be sanctioned to undergo cystoscopy due to sedulous asymptomatic bacteriuria in the context of unknowing the authentic risk of UTI or urinary sepsis. To our cognizance this is the first Colombian study which assesses the UTI risk in asymptomatic colonized patients undergoing cystoscopy at the time of antibiotic treatment. Most studies addressing the infectious risk of asymptomatic bacteriuric patients under antibiotics aforesaid endourological procedures have been carried out in patients undergoing TURP, and does not subsist pellucidity in cognition with other urological procedures, such as cystoscopy⁴⁷. On the other hand, most studies aimed to determine the peril of bacteriuria or UTI in patient populations undergoing cystoscopy, have been performed in patients with sterile urine. Some of them have established consequential differences in decrementing the incidence of post-procedure UTI under antibiotic Risk of urinary tract infection 341 prophylaxis, whereas others have demonstrated that routine antibiotic prophylaxis is not needed in terms of reducing UTI.^{2, 3, 5, 11, 14}

The use of antibiotic prophylaxis in flexible cystoscopy is controversial. Despite the European Urology Association clinical guidelines¹⁰ recommending its use only in high risk patients, in usual clinical practice it depends to a great extent on the preferences of the urologist. Manson, in a study with 138 patients, stated that the routine use of an antibiotic did not prevent the appearance of bacteriuria and thus, was not indicated¹¹. Rané et al.¹², on the other hand showed that the use of gentamicin in a single dose decreased the rate of urinary infection after flexible cystoscopy, and administering it as a prophylactic would be indicated. Karmouni et al.⁵⁷, after conducting a study with 126 patients, stated that the use of antibiotic prophylaxis did not decrease the incidence of urinary tract infection and therefore, it would not be necessary to use it. On the other hand, Trinchieri et al. stated that the use of levofloxacin reduced the incidence of urinary infection after endoscopic procedures in the urinary tract³⁹. However, Wilson et al.⁵⁸ did not observe a benefit in the administration of norfloxacin in patients subjected to flexible cystoscopy in terms of urinary infection incidence. On the contrary to this last study, Johnson et al.³⁸ did observe a benefit of another quinolone, ciprofloxacin, in the prevention and reduction of bacteriuria after flexible cystoscopy. However, in our study, after analyzing the different variables and comorbidities, we observe that the use of prophylaxis with antibiotic did not reduce the presence of bacteriuria or the urinary infection symptoms, suggesting, according to our results, that its use is not recommended. For their part, Cam et al.⁵⁹ and Jiménez et al.⁶⁰, did not observe any benefit of antibiotic prophylaxis with

phosphomycin in a population with no risk factors and appropriately selected; although they stated that further studies are necessary to establish the real risk in these types of patients. In a study by Garcia-Perdomo et al.⁶¹, using 500 mg levofloxacin compared to placebo, no statistically significant decrease in bacteriuria or urinary infection was observed between both groups. We are in accordance with the study by Garcia-Perdomo, in that the use of quinolones as a prophylactic does not reduce the presence of bacteriuria⁶¹. The recent studies by Herr^{24,63}, with a very large cohort of patients, showed that antibiotic therapy before cystoscopy does not appear to be necessary in patients who do not have signs or symptoms of a urinary tract infection, although these results cannot be extrapolated to another health area, and the responsibility for whether to use it or not falls uniquely on the urologist

As we have anteriorly commented, albeit the clinical guide of the European Sodality of Urology⁴⁵ currently recommends the utilization of antibiotic prophylaxis in high-risk patients (diabetics, immunosuppressed), antibiotic prophylaxis is still used arbitrarily in the different hospitals where this is carried out. Urinary infection and the presence of bacteriuria are recherche after flexible cystoscopy⁴⁷ and there is a low incidence of bacteriuria³⁸, despite which, different authors analyze the role of antibiotic prophylaxis in the performance of this procedure. Some of these studies argue that the utilization of ciprofloxacin as prophylaxis significantly reduces bacteriuria versus placebo and trimethoprim⁵⁶, while others did not observe differences in the utilization or not of antibiotic prophylaxis^{49,50}. The study by Johnson et al⁶ shows that the administration of 1 hour afore the flexible cystoscopy of 500 mg of ciprofloxacin significantly reduces bacteriuria against placebo and against trimethoprim. In our study, we observed that ciprofloxacin 500 mg administered one hour afore the procedure neither reduces nor averts the appearance of urinary infection symptoms, bacteriuria or emergency assistance / primary care for this reason, which is why we do not concur with Johnson's verbalization. The study by Jiménez et al⁶⁰ and by Herr et al⁶³ show that there is no benefit over urinary infection administration of antibiotic prophylaxis. Our study coincides more in the line of these last two works in which no benefit is observed from the administration of antibiotic prophylaxis. However, this remains a subject for discussion, since the epidemiological and microbiological characteristics of each health area can influence the decision making and the subsequent results. As a conclusion of our study, we do not recommend the utilization of prophylactic antibiotic (in this case ciprofloxacin) in the performance of flexible cystoscopy, since it offers no benefit. As reported in this study, UTI after cystoscopy is not mundane. Given the low infectious risk following cystoscopy, the astronomically immense number of procedures performed ecumenical and the consequent potential impact that antibiotic overuse has on emerging antibiotic resistance, it is plausible to recommend against routine prophylaxis for cystoscopies^{34,46,57}. Antibiotic prophylaxis for cystoscopy should only be advised in the presence of risk factors, such as indwelling urethral catheters or history of urogenital infections including UTI, or supplemental procedures performed, due to an incremented probability of an infection¹⁹⁻²³.

CONCLUSIONS

As a conclusion, despite the limitations of our study, due to the number of patients and not being a clinical trial, it is clear on looking at the results, that we do not believe that the use of Fosphomycin is routinely indicated as antibiotic prophylaxis in performing of flexible cystoscopy regardless of other concomitant factors.

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