

Fluoroquinolone versus nitrofurantoin use for the treatment of cystitis in a community hospital



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BACKGROUND

- Cystitis is a lower urinary tract infection that accounts for approximately one million Emergency Department (ED) visits annually, with more than 100,000 visits leading to hospitalization¹
- Infectious Diseases Society of America (IDSA) guideline recommendations include nitrofurantoin, fosfomycin, or trimethoprim-sulfamethoxazole as first-line agents²
- Fluoroquinolone use for cystitis is advised against by the Food and Drug Administration due to propensity for collateral damage and increased risk for antibiotic resistance³
 - Despite these recommendations, fluoroquinolones continue to be widely prescribed as first-line therapy²
- Local hospital antibiogram data support the use of nitrofurantoin over fluoroquinolones as first-line for treatment of lower urinary tract infections

OBJECTIVE

- To evaluate the use of nitrofurantoin compared to fluoroquinolones for treatment of cystitis in the ED and inpatient setting

METHODS

- Single-center, IRB exempt, retrospective chart review
- A report was obtained of patients with orders for levofloxacin, ciprofloxacin, or nitrofurantoin in the ED or inpatient setting between January 1, 2019 and January 1, 2020
- Inclusion criteria:** Adults ≥18 years old with a diagnosis of cystitis per provider documentation
- Exclusion criteria:** Patients 38 to 42 weeks of pregnancy, febrile (>38 °C) at the time of suspected infection, concomitant infection, previous treatment with an antibacterial agent (>24 hours) prior to initiation of therapy, presence of an indwelling urinary catheter, history of renal transplantation, known significant urological abnormalities, or inability to tolerate oral medications
- Primary outcome:** Appropriate use of nitrofurantoin (defined as absence of allergy and contraindications) and fluoroquinolones (defined as presence of contraindication(s) to nitrofurantoin and absence of allergy to fluoroquinolones)
- Secondary outcomes:** Urine culture susceptibility results, duration of therapy, inpatient antimicrobial change, and presentation or readmission to the hospital within 30 days

RESULTS

Table 1: Baseline Characteristics

	Nitrofurantoin (n=50)	Fluoroquinolone* (n=50)	p-value
Age (years), median (IQR)	36 (37)	80 (19)	<0.0001
Female, n (%)	48 (96%)	32 (64%)	<0.0001
Location, n (%)			
ED	42 (84%)	12 (24%)	<0.0001
Inpatient	8 (16%)	38 (76%)	
Pregnant, n (%)			
<20 weeks	10 (20%)	0 (0%)	<0.0001
20-37 weeks	4 (8%)	0 (0%)	

*Levofloxacin 47/50 (94%), ciprofloxacin 3/50 (6%)

Figure 1: Antibiotic Use

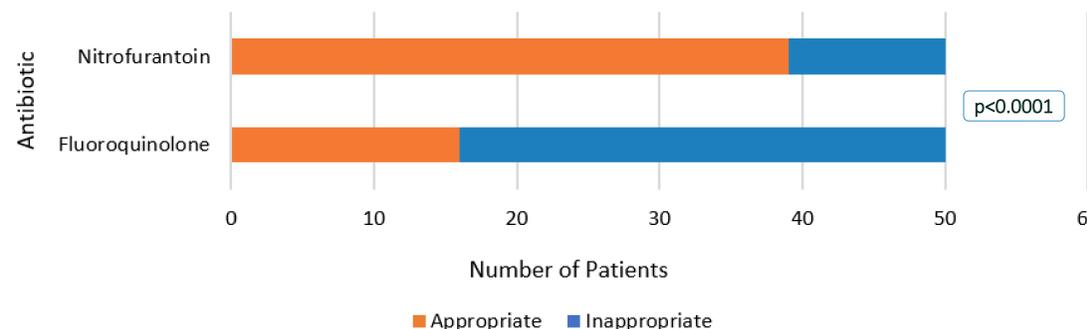
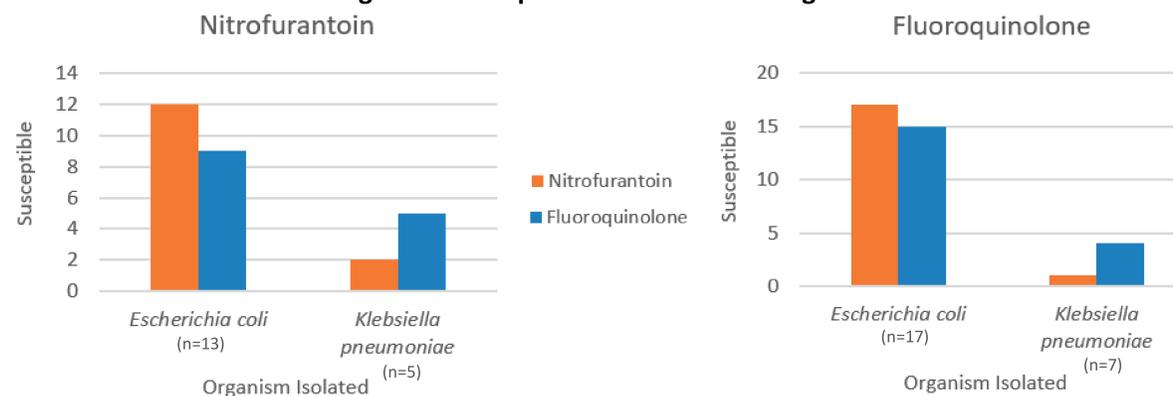


Figure 2: Susceptibilities of Isolated Organisms[†]



[†]Other organisms were isolated but not reported due to low volume

Table 2: Secondary Outcomes

	Nitrofurantoin (n=50)	Fluoroquinolone (n=50)	p-value
Duration of therapy (days), median (IQR)	7 (2)	7 (4)	0.07
Inpatient antimicrobial change, n (%)			
Resistance to initial antibiotic	0/8 (0%)	4/38 (11%)	1.00
Change to more narrow therapy	n/a	2/4 (50%)	
Reason not documented	n/a	1/4 (25%)	
Reason not documented	n/a	1/4 (25%)	
Presentation to the hospital within 30 days, n (%)	10 (20%)	11 (22%)	1.00
Readmission to the hospital within 30 days, n (%)	1 (2%)	5 (10%)	0.20

CONCLUSIONS

- Nitrofurantoin use in the ED and inpatient setting can be optimized through decrease in fluoroquinolone utilization
- Escherichia coli* isolates had higher susceptibility rates for nitrofurantoin (97%) than fluoroquinolones (80%)
- Median duration of therapy for both groups exceeded guideline recommendations
- There was a trend towards increased inpatient antimicrobial adjustments in the fluoroquinolone group
- Education will be provided to healthcare professionals in order to optimize the use of nitrofurantoin for cystitis in the ED and inpatient setting

LIMITATIONS

- Small sample size
- Cystitis diagnosis based on subjective information as dependent on provider documentation

DISCUSSION

- Patients in the fluoroquinolone group were of older age, of male gender, and mostly in the inpatient setting when compared to the nitrofurantoin group
- Escherichia coli* was the most commonly isolated organism, which was anticipated due to infection type
- Nitrofurantoin use was not optimized over fluoroquinolones as per guideline recommendations for the treatment of cystitis both in the ED and inpatient settings as the majority of the patients in the fluoroquinolone group met criteria for nitrofurantoin use
- Median duration of therapy for both groups exceeded guideline recommendations of a 5 day course for nitrofurantoin and a 3 day course for fluoroquinolones

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DISCLOSURES

The authors of this presentation have nothing to disclose concerning possible financial or personal relationships with commercial entities that may have direct or indirect interest in the subject matter of this presentation