Comparison of Cephalexin and Nitrofurantoin in the Treatment of Uncomplicated Urinary Tract Infections in Women

Shivani Adhyaru, DO, Elly Oh, PharmD, Dimple Patel, PharmD, Frank Diaz, PharmD, Danielle Biggs, MD, Esther King, PharmD, Deborah King, PharmD, Jason Kessler, MD

INTRODUCTION

- Urinary tract infections (UTI) are among the most common bacterial infections inflicting patients and have resulted in 2-3 million emergency department visits annually in the US.1
- The Infectious Diseases Society of America recommended first-line therapy for uncomplicated UTI is nitrofurantoin due to its minimal resistance and low tendency for collateral damage, followed by trimethoprim-sulfamethoxazole.2
- Beta-lactams, are reserved for cases in which other agents cannot be used.
- With increasing prevalence of antibiotic resistance and collateral damage, cephalexin should be studied to determine its role as a treatment option for uncomplicated UTIs.

OBJECTIVE

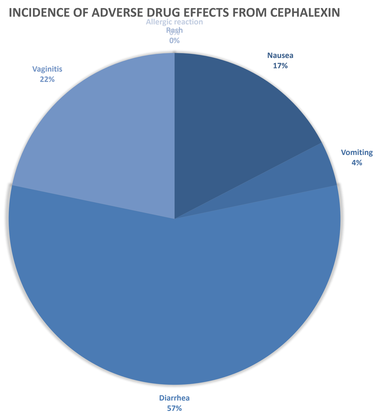
To determine if cephalexin is noninferior to nitrofurantoin for the treatment of uncomplicated urinary tract infections

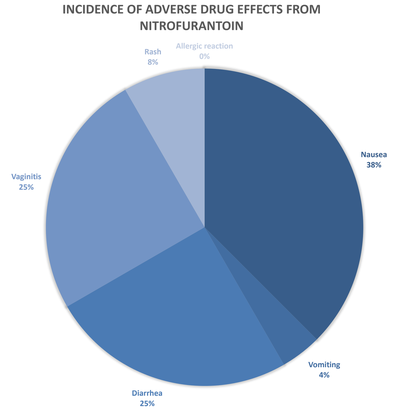
METHODS

- This was a retrospective chart review of three community hospital emergency department patients who received nitrofurantoin versus cephalexin for uncomplicated UTI.
- Patients who met criteria were called 7-10 days after their ED visit for follow-up to assess symptom resolution, medication compliance, and adverse drug reactions.

RESULTS

- A total of 2,321 patient medical charts were reviewed from August 2019 through April 2020, and a total of 100 patients were included and reached during the 7-10 days follow-up call.
- Baseline characteristics, UTI history, and 100% medication compliance were similar between groups.
- The overall clinical cure at 7-10 days follow-up was 83.6% in the cephalexin group and 82.1% in the nitrofurantoin group (p=0.841).
- Approximately 24% of patients in the cephalexin group had recurrent urinary symptoms after initial resolution by 30-33 days compared to 15.4% in the nitrofurantoin group (p=0.695).
- Adverse drug reactions occurred in 29.5% of patients prescribed cephalexin and 43.6% of patients prescribed nitrofurantoin (p=0.153) .





Incidence of adverse drug effects

Safety Endpoint	Cephalexin Group (n=61)	Nitrofurantoin Group (n=39)	p Value
ADR Occurrence	18 (29.5%)	17 (43.6%)	0.153
Nausea	4 (6.6%)	9 (23.1%)	**0.030**
Vomiting	1 (1.6%)	1 (2.6%)	>0.999
Diarrhea	13 (21.3%)	6 (15.4%)	0.447
Vaginitis	5 (8.2%)	6 (15.4%)	0.288
Rash	0 (0%)	2 (5.1%)	0.150
Allergic reaction	0 (0%)	0 (0%)	>0.999

Note: Data expressed as n (%).

Treatment outcomes by 7-10 days and 30-33 days follow up

Endpoints	7-10 Day Follow-Up			30-33 Day Follow-Up		
	Cephalexin Group (n=61)	Nitrofurantoin Group (n=39)	p Value	Cephalexin Group (n=29)	Nitrofurantoin Group (n=13)	p Value
Primary Endpoint						
Clinical Cure	51 (83.6%)	32 (82.1%)	0.841			
Secondary Endpoints						
Clinical Cure				7 (24.1%)	2 (15.4%)	0.695
Subsequent visits due to UTI symptoms	3 (4.9%)	4 (10.3%)	0.427	2 (6.9%)	1 (7.7%)	>0.999
Antibiotic changed for unresolved symptoms	1 (1.6%)	1 (2.6%)	>0.999	2 (6.9%)	1 (7.7%)	>0.999

Abbreviation: UTI, urinary tract infection.
Note: Data expressed as n (%).

DISCUSSION

- Although cephalexin is recommended as an alternative for the treatment of uncomplicated UTI by IDSA, there is limited literature supporting its use. This study was conducted to provide more evidence in the use of cephalexin.
- Results showed cephalexin and nitrofurantoin for the treatment of uncomplicated UTI in the ED had similar clinical cure rates by 7-10 days and 30-33 days follow-up.
- Both antibiotics were well tolerated, and majority of the adverse effects were mild.
- Due to the unprecedented low patient volume during the spring of 2020, patient chart review and follow-up calls ended before the sample size could be reached.
- This study could not prove cephalexin was noninferior to nitrofurantoin as the sample size could not be achieved.
- Despite this, the clinical cure rates of nitrofurantoin were numerically like previous studies.7,8

CONCLUSION

- **Cephalexin should be considered alternative option for the treatment uncomplicated UTI in women depending on regional resistance patterns.**
- Study limitations include cultures not obtained from every patient, medication noncompliance, patients lost to follow-up, and lack of documentation of medical records due to the retrospective nature of this study.
- Limited by Type II error as the sample size needed to prove noninferiority was not achieved.
- Nausea occurred at a significantly higher percentage in those who received nitrofurantoin compared to cephalexin (p=0.03).

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Complete references available upon request.