



Cefdinir Versus Cephalexin for the Treatment of Urinary Tract Infections: A Retrospective Evaluation

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Introduction

- Background:**
- Urinary tract infections (UTI) are one of the most common bacterial infections¹
 - Treatment failure occurs in up to 16% of the general population²
 - Cephalexin and nitrofurantoin are recommended as first-line agents for UTI in BayCare emergency rooms based on IDSA guidelines and local susceptibilities³
 - Cefdinir is overprescribed in BayCare emergency rooms due to misconceptions that a broader spectrum of activity equates to greater efficacy
 - Differences in urine concentration between cefdinir and cephalexin could result in dissimilar efficacy for the treatment of UTIs^{4,5}
 - Comparative efficacy studies between cefdinir and cephalexin for the treatment of UTI are lacking

- Research Question:**
- Is there a difference in the rate of treatment failure in lower UTI between cefdinir and cephalexin?

- Outcomes:**
- Primary: Treatment failure defined as revisit to the emergency department or antibiotic switch within 7 days
 - Secondary outcomes: Treatment failure at 14 days, treatment failure in uncomplicated and complicated UTI at 7 and 14 days

Methods

- Study Design:**
- IRB-approved, multicenter, retrospective chart review utilizing Tableau to identify patients with a diagnosis of cystitis or UTI from July 31st 2021 to July 31st 2022

Table 1: Inclusion and Exclusion Criteria

Inclusion Criteria	Exclusion Criteria
<ul style="list-style-type: none">• Patients discharged from the emergency department at 11 BayCare hospitals• Diagnosis of UTI or cystitis without hematuria• Corresponding prescription for cefdinir or cephalexin	<ul style="list-style-type: none">• Pyelonephritis• Fungal UTI• More than one antibiotic prescription• UTI or receipt of antibiotics in the past 2 weeks• Multiple infectious diagnoses

- Statistical Analysis:**
- Nominal data was analyzed using the Chi-square or Fisher’s Exact Test
 - Non-parametric continuous data was analyzed using the Mann-Whitney Test
 - A sample size of 242 was used to achieve an 80% power to detect a 15% difference between groups with a significance level of 0.05

Results

Table 2: Study Population

Baseline Characteristic	Cefdinir (n = 121)	Cephalexin (n = 121)	p-value
Age, yr. – median (IQR)	57 (25.0-75.0)	43 (25.0-68.5)	0.204
Female sex – no. (%)	94 (77.7)	100 (82.6)	0.332
Classification – no. (%)			
Uncomplicated	88 (72.7)	94 (77.7)	0.371
Complicated	33 (27.3)	27 (22.3)	0.371
Organism identified – no. (%)	64 (52.9)	51 (42.1)	0.092
<i>E. coli</i> – no. (%)	36 (56.2)	27 (52.9)	0.723
<i>K. pneumoniae</i> – no. (%)	7 (10.9)	6 (22.2)	0.890
<i>P. mirabilis</i> – no. (%)	7 (10.9)	5 (18.5)	0.843
Susceptible organism – no. (%)	56 (87.5)	45 (88.2)	0.904
Diabetes – no. (%)	20 (16.5)	15 (12.4)	0.360
Pregnant – no. (%)	0	2 (1.7)	0.154
Beta-lactam allergy – no. (%)	25 (20.7)	16 (13.2)	0.121
Received IV or IM antibiotics – no. (%)	61 (50.4)	51 (42.1)	0.196

Figure 1: Overall Treatment Failure at 7 and 14 Days

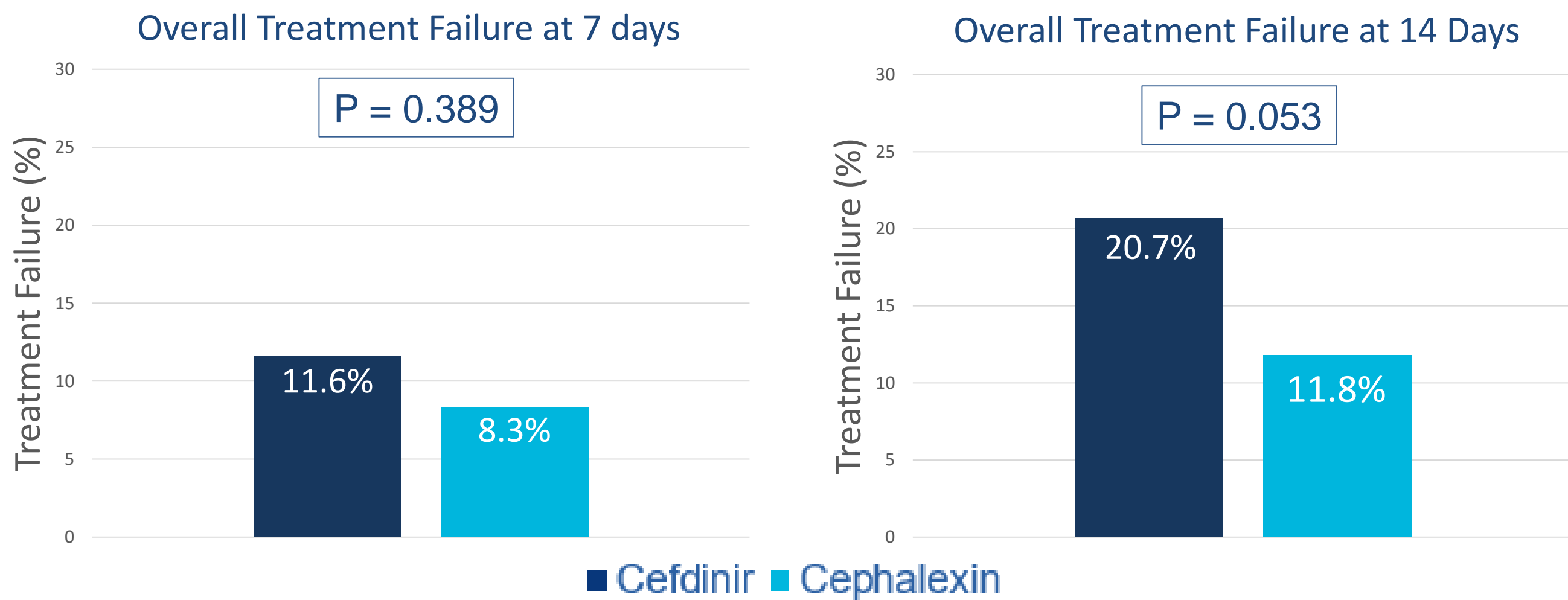


Table 3: Subgroup Analysis

Outcome	Cefdinir	Cephalexin	p-value
Treatment failure at 7 days – no. (%)			
Uncomplicated	10/88 (11.4)	6/94 (6.4)	0.238
Complicated	4/33 (12.1)	4/27 (14.8)	1.000
Treatment failure at 14 days – no. (%)			
Uncomplicated	16/88 (18.2)	9/94 (9.6)	0.092
Complicated	9/33 (27.2)	5/27 (18.5)	0.054

Conclusion

- There were no significant differences between cefdinir and cephalexin for the primary or secondary endpoints
- These results show a trend toward a higher rate of treatment failure with cefdinir at 14 days
- This study suggests cefdinir and cephalexin offer similar efficacy despite differences in pharmacokinetics

Discussion

- Strengths:**
- Contributes to a gap in literature
 - Assessment of frequently used antibiotics
 - Broad study population

- Limitations:**
- Prescription data may not be available for all patients
 - Compliance cannot be assessed
 - No comparison of safety

- Future Directions:**
- Continue to endorse cephalexin as a first-line agent within the health system due to similar efficacy and lower cost
 - Investigation of larger populations and a longer time frame may be beneficial in elucidating differences between cefdinir and cephalexin

Disclosure

The authors have nothing to disclose concerning possible financial or personal relationships with commercial entities that may be referenced

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