High Prevalence of Fluoroquinolone-Resistant Urinary Tract Infection Among US Emergency Department Patients Diagnosed with UTI, 2018-2020

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Introduction

- Urinary tract infections (UTI) are one of the most commonly treated infections in the emergency department (ED), accounting for ~ 3 million visits annually, resulting in a significant number of antibiotic prescriptions.
- FQ-resistant Enterobacterales prevalence is >20% in many US communities, exceeding threshold rates recommended to change from one antibiotic class to another for empirical treatment
- Additionally, the prevalence of extended spectrum β-lactamase (ESBL)-producing Enterobacterales continues to increase, now exceeding 20% in some use locations

Objective

- Determine recent resistance prevalence from a geographically diverse sample of US Emergency Departments (ED).

Study Design, Setting, and Population

- A multi-center, observational cohort study: 2018-2020
- Conducted in a network (Emergency Medicine PHARMacotherapy Research NETwork (EMPHARM-NET]) of geographically diverse EDs across the US

- Included Population
  - Adults ≥ 18 years of age
  - Primary diagnosis of cystitis, pyelonephritis, or UTI
  - Discharged home from the ED
- Definitions
  - Uncomplicated cystitis: dysuria, frequency, urgency, suprapubic pain, or hematuria
  - Uncomplicated pyelonephritis: fever (temperature >38^{O}C), chills, flank pain, costovertebral-angle tenderness, and nausea or vomiting
  - Complicated cystitis and pyelonephritis: men or women with anatomical conditions that may increase the risk of treatment failure or serious outcomes (e.g., obstruction, stone, pregnancy, male sex, diabetes, neurogenic bladder, renal insufficiency, immunosuppression)

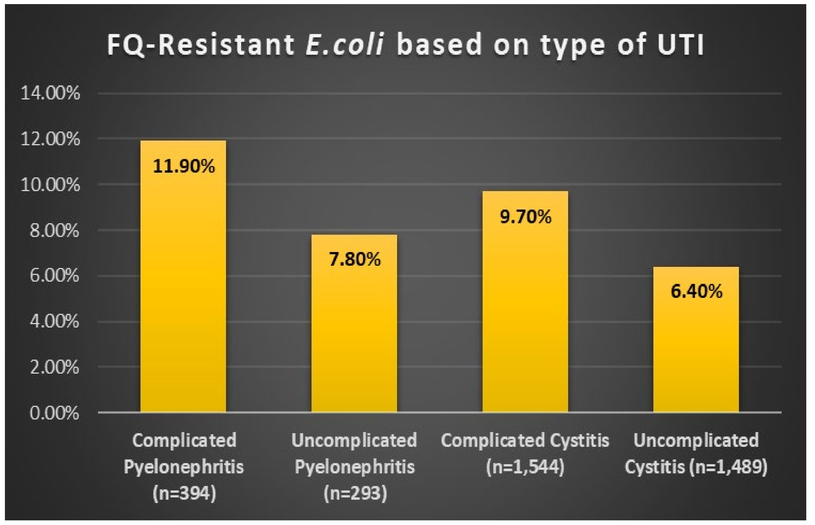
Outcomes

- Primary analysis included calculating descriptive statistics for uropathogens and susceptibilities.
- Secondary analysis: Identifying antimicrobial risk factors associated with FQ-resistant *E. coli* using multivariable logistic regression

Results

Demographic and Clinical Characteristics	Overall (N=3,779)	
Age in years, median (IQR)	62.9	(41.0-77.6)
Sex, n (%)		
Female	2,882	76.3
Culture positive, n (%)	2,269	60.0
Disposition, n (%)		
Discharged from ED	2,483	65.7
Admitted - Non-ICU	1,159	30.7
Admitted - ICU	106	2.8
UTI Characteristics, n (%)		
Chief complaint UTI	1,902	50.3
UTI Type		
Pyelonephritis, uncomplicated	293	7.8
Pyelonephritis, complicated	394	10.4
Cystitis, uncomplicated	1,489	39.4
Cystitis, complicated	1,544	40.9
Risk Factors for Antimicrobial Resistance, n (%)		
Previous IV or oral antibiotic use in the last 90 days)	1,095	29.0
Hemodialysis dependence	55	1.5
Urinary tract abnormality (e.g. catheter)	587	15.5
Long-term or intermittent urinary catheter	369	9.8
Nephrolithiasis	107	2.8
Renal transplant	42	1.1
Neurogenic bladder	134	3.5
Nephrostomy tubes	52	1.4
Residence in a long-term care facility	284	7.5

Uropathogen	Overall (n =3,779)		
	n	% of total sample	% of culture-positive
E.coli	1,428	37.8	62.9
K. pneumoniae	295	7.8	13.0
ESBL-producing pathogen	167	4.4	7.4
CRE-producing pathogen	6	0.2	0.3



- ***E. coli* FQ-resistance**
  - 22.1% of the entire cohort
  - Range: 10.5% – 29.7% by study site

- **Risk Factors for FQ-resistance *E.coli***
  - Previous IV or oral antimicrobial use in the last 90-days
    - OR:1.69, 95% CI:1.33-2.14
  - Complicated vs. Uncomplicated UTI
    - OR 1.60, 95% CI: 1.26-2.02

Conclusion

- FQ-resistant *E. coli* is widely prevalent across the US with geographic variation
- Community-associated ESBL-producing uropathogens appear to be increasing across the US

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