

Investigation of Empiric Oral Antibiotics in the Treatment of Extended Spectrum Beta-Lactamase Urinary Tract Infections



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Abstract

Urinary tract infections are common infections that are routinely treated with antibiotics in the outpatient setting. A majority of urinary tract infections are caused by gram negative bacteria belonging to the Enterobacteriaceae family. Over prescribing of antibiotics has increased the presence of resistance in these pathogens, specifically extended spectrum beta lactamase (ESBL) resistant to penicillin and cephalosporin antibiotics. Urinary tract infections caused by ESBL Enterobacteriaceae can be more difficult to treat and are associated with worse clinical outcomes.

The objective of this study is to evaluate and compare oral antibiotic susceptibilities to ESBL Enterobacteriaceae of patients diagnosed and treated outpatient with an urinary tract infection; looking specifically at nitrofurantoin, sulfamethoxazole/trimethoprim, fluoroquinolones, and fosfomycin. Secondary objectives being evaluated include: history of ESBL urinary tract infections, have a chronic foley, and if a change in therapy was required.

These objectives will be assessed through a retrospective chart review with patients being identified by reviewing pharmacist intervention notes completed during culture callback services. Data will be analyzed using descriptive and observational statistics to assess antibiotic susceptibility rates.

The results of this study will be used to help provide guidance to pharmacists and other practitioners at Regions Hospital in choosing optimal treatment for ESBL Enterobacteriaceae urinary tract infections.

Objectives

- To retrospectively determine if there are better empiric oral antibiotics to use in the setting of ESBL urinary tract infections treated outpatient

Methods

Study Design

- Retrospective chart review (March 2018-December 2020)
- ESBL urine cultures collected with the emergency department
 - Discharged on oral antibiotics
- Data collected from pharmacist I-vent data in EPIC
- Sample Size
 - 32 patients that met inclusion & exclusion criteria

- Primary Outcome: Compare susceptibility data of ESBL enterobacteriaceae urinary tract infections to: fluoroquinolones, nitrofurantoin, sulfamethoxazole/trimethoprim & fosfomycin

Secondary Outcomes:

- History of ESBL urinary tract infections

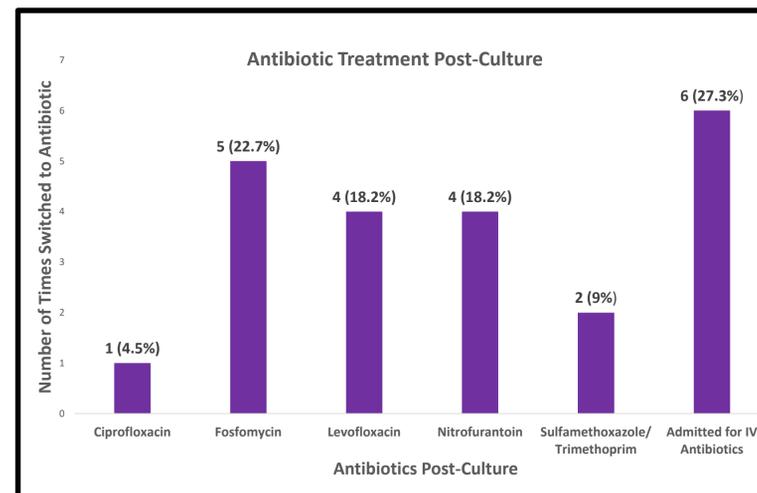
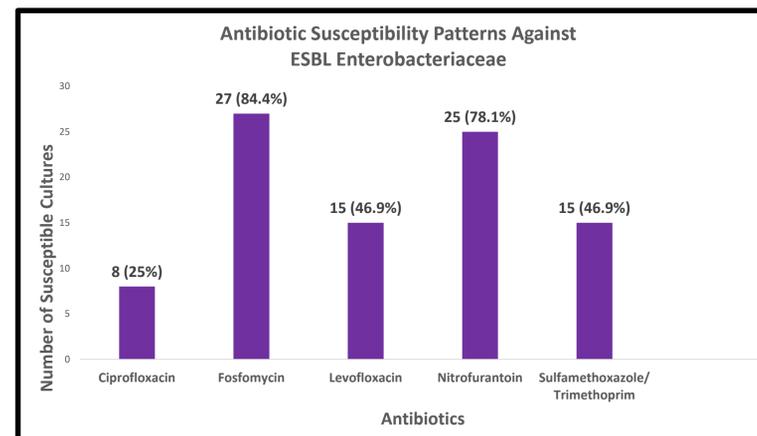
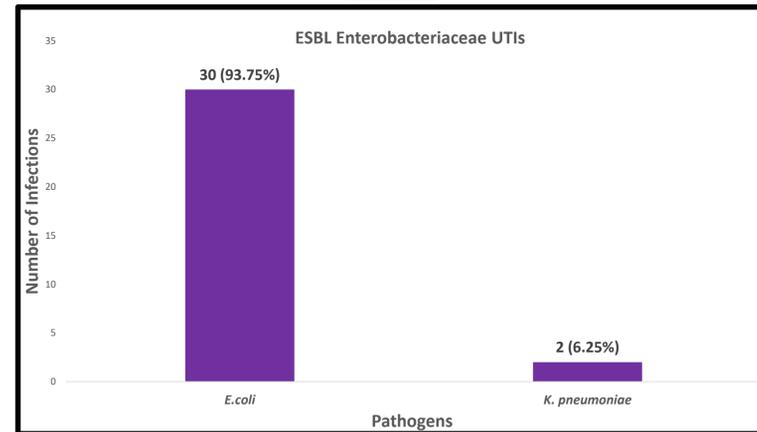
Inclusion Criteria

- Age 18 years or older
- ESBL enterobacteriaceae urine culture
 - Susceptibilities
 - ESBL designated by microbiology
- Received empiric oral antibiotic treatment outpatient

Exclusion Criteria

- Aged less than 18 years old
- Admitted to Regions Hospital for treatment

Results



History of ESBL UTI	History of Chronic Foley	Change in Therapy Needed
8 (25%)	5 (15.6%)	22 (68.8%)

Conclusions

- Current ESBL E. coli species are more susceptible to fosfomycin and nitrofurantoin
 - May be a better empiric antibiotic in patients with a history of ESBL urinary tract infections
- History of ESBL (25%) & Chronic Foley (15.6%)
 - Correlates with CDC's findings of the large rise seen in ESBL pathogens is due to community-acquired ESBL infections
- Nitrofurantoin & fosfomycin can only be utilized for simple cystitis
 - Avoid their use if concerns for pyelonephritis

Strengths

- Focus on improving healthcare for patients with a clinically meaningful endpoint
- Help provide guidance in antibiotic selection
- Improves knowledge in an area with limited published data

Limitations

- Retrospective nature
- Utilization of pharmacist I-vent data
- Small study

Next Steps

- Summarize results for emergency medicine pharmacists & providers to improve treatment of possible ESBL urinary tract infections
- Continual evaluation of ESBL urinary tract infections and their susceptibility patterns

References

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