

Simple Cystitis: Does Urine Culture Change Management?



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Background

Simple cystitis, defined as a bladder infection in immunocompetent women of childbearing age without comorbidities/urological abnormalities, is the most common bacterial infection in women. Urine cultures are often sent in for these patients to ensure that the infective pathogen is sensitive to the antibiotic prescribed and to inform possible treatment modifications.

Aims

The aim of our study is to evaluate the utility of the urine culture in the treatment of patients with simple cystitis.

Methods

Data collection:

- Retrospective chart review for urine culture positivity rates and resistance patterns
 - 3 independent chart reviewers
 - 60% reviewed by 2 reviewers to evaluate interrater reliability

Population:

- Female patients
- Between the age of 18 and 65 years
- Discharged from the UC Davis Emergency Department (ED) with diagnosis of urinary tract infection between January 1, 2018 and December 31, 2018.

Exclusion criteria:

- ED visit for UTI in the last month
- Immunocompromised
- Pregnancy
- History of renal transplant
- Known structural urologic abnormality

Analysis:

- Simple statistics performed using Stata 14.2
- Cohen's Kappa performed to determine interrater reliability

Outcomes:

- Primary: Number of cases requiring changes in antibiotic therapy
- Secondary: Return visits within 1 month for continued symptoms

Results

Cultures

- 513 charts reviewed manually
 - 91.5% agreement
 - Cohen's kappa: 0.755
- 388/513 met inclusion criteria
- 153/388 had culture sent on initial ED visit
- 146/153 cultures were positive
 - 6 resistant cultures (3.9%, 95% CI 1.4-8.3%)

Table 1: Distribution of pathogens observed in positive cultures.

Pathogen	Positive cultures
Mixed flora	69
E. Coli	65
Klebsiella	5
Other	7

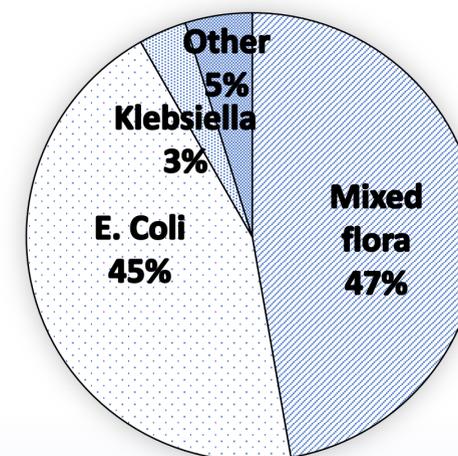


Figure 1: Percentages of pathogens observed in positive cultures.

Return visits

- 8 return visits in culture group (8/153, 5.2%, 95% ci 2.3-10.0%)
- 12 return visits in non-culture group (12/235, 5.1%, 95% ci 2.7-8.7%)

Resistance patterns

- Sensitivities tested on 70 cultures

Table 2: Distribution of antibiotic resistances observed in susceptibility tests.

	Ampicillin	Cefazolin	Cefepime	Ceftriaxone	Gentamicin	Levofloxacin	Nitrofurantoin	Bactrim
Resistant	36	5	3	3	5	7	5	23
Susceptible	34	65	67	67	65	63	65	47

Conclusion

- Ordering of routine urine cultures in female patients discharged from the Emergency Department with a diagnosis of simple cystitis who do not meet our exclusion criteria is unnecessary and unlikely to change management.
- It does not appear to decrease the rate of repeat visits within 1 month for recurrent or persistent symptoms of a urinary tract infection (Culture: 8/153, 5.2%, 95% ci 2.3-10.0% vs. Non-culture: 12/235, 5.1%, 95% ci 2.7-8.7%)

Foregoing these cultures could lead to significant healthcare cost savings.

- Average billed cost of ED urine culture: \$269.50
 - Potential cost savings of forgoing cultures = $153 \times 269.50 = \$41,233.50$
- Average billed cost of culture susceptibilities: \$350.35
 - Potential cost savings of forgoing susceptibilities = $70 \times 350.35 = \$24,524.50$
- Total potential healthcare cost savings = $41,233.50 + 24,524.50 = \$65,758$

Limitations

- Retrospective chart review
- Possibility of patients seeking initial/further care at other institutions/hospitals

References

- Long B, Koyfman A. The Emergency Department Diagnosis and Management of Urinary Tract Infection. *Emerg Med Clin North Am.* 2018;36(4):685-710.
- Huttner A, Kowalczyk A, Turjeman A, et al. Effect of 5-Day Nitrofurantoin vs Single-Dose Fosfomycin on Clinical Resolution of Uncomplicated Lower Urinary Tract Infection in Women: A Randomized Clinical Trial. *JAMA.* 2018;319(17):1781-1789.

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