

ANTIMICROBIAL THERAPY FOR UNCOMPLICATED CYSTITIS IN THE EMERGENCY DEPARTMENT

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Disclosures

No conflicts of interest to disclose

Background

- Uncomplicated cystitis is one of the most common bacterial infections in women
- In 2015, it was responsible for 2-3 million emergency department visits annually
 - -\$3.5 billion
- Antimicrobial resistance is increasing

Background

IDSA Guidelines were last updated in 2011

First Line

- Sulfamethoxazole-trimethoprim
- Nitrofuratoin
- Fosfomycin

Second Line

- Fluoroquinolones
- Beta-lactams

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Regional Antibiogram - 2018

 Susceptibilities for E. coli from the urine based on the 2018 regional antibiogram (%)



<u>Hospitals Included</u>: Christian Hospital, Alton Memorial Hospital, Barnes- Jewish Hospital, St. Louis Children's Hospital, Parkland Health Center

Background

- In 2015, Percival et al evaluated adherence to pharmacy recommendations before & after physicians were educated on local resistance rates
 - Appropriate antimicrobials increased 44% → 80%
 - Nitrofurantoin use increased 12% → 80%
 - Empiric therapy corresponding to cultured susceptibilities increased 74% → 89%

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Background

 Purpose: Evaluate the regimens of antibiotics prescribed for the treatment of uncomplicated cystitis based on the regional antibiogram

- Clinical Impact:
 - Develop & implement order set
 - Add to current literature

Research Question

Do emergency department providers at Christian Hospital provide appropriate outpatient antibiotics for uncomplicated cystitis in accordance to the BJC Medical Group outpatient protocol?

Review Antibiotic Allergies And Last Creatinine Then Sent Prescription Through Epic:

- First choice no allergy to nitrofurantoin and last creatinine < 1.5 mg/dL (within 3 years)
 - Nitrofurantoin 100 mg PO BID for 5 days
 - "Take 1 pill by mouth twice a day for 5 days"
- Second choice no allergy to cephalexin and creatinine < 1.5 mg/dL (within 3 years)
 - Cephalexin 500 mg PO BID for 5 days
 - "Take 1 pill by mouth twice a day for 5 days"
- Third choice no allergy to Fosfomycin and no creatinine on file
 - Fosfomycin 3 grams PO for 1 dose
 - "Take entire packet of granules with water as directed on the package"

Patient Instructions:

- Drink plenty of fluids (2-3 liter per day)
- Call back if:
 - Pain does not improve by day 3 on antibiotics
 - Urine symptoms (frequency, urgency, pain) do not improve by day 3 of antibiotics
 - You become worse develop fever, flank pain, etc.

Methods

- Assess appropriateness of prescribed antibiotics for uncomplicated cystitis according to the outpatient BJC Medical Group protocol through chart review
 - 1) Nitrofurantoin 100 mg PO BID x 5 days
 - 2) Cephalexin 500 mg PO BID x 5 days
 - 3) Fosfomycin 3 grams PO x 1 dose



Methods

Primary Outcome

Adherence to outpatient BJC protocol

Secondary Outcomes

- Comparison of prescribed antibiotics to available urine cultures
- Incidence of prolonged duration of therapy
- Incidence of fluoroquinolone use

Data Collection

Prescription

Dose, Frequency,
 Route, Duration

Objective

Dysuria, Polyuria,Suprapubic Pain

Demographics

Age, Height, Weight,Race, Allergies

Vitals/Labs

 Temperature, Blood Pressure, Heart Rate, Serum Creatinine, Glucose, White Blood Cells, Creatinine Clearance

Diagnostics

Urinalysis (WBC),
 Urine Culture

Inclusion Criteria

Women

Age ≥ 18 years old and < 65 years old

Diagnosis of cystitis or UTI without systemic symptoms

Outpatient Therapy

Exclusion Criteria

Antibiotics within Pregnancy Recurrent UTI Uncontrolled DM previous 30 days **Indwelling catheter** CrCl < 30 mL/min **Immunocompromised Pyelonephritis Resident of LTCF or Concomitant STI Antibiotic prophylaxis Inpatient Therapy** nursing home

Statistical Analyses

- Descriptive statistics (percentages)
- Sample size 100 patient
- 738 patients identified between January 2019-June 2019
- Included Northeast and Northwest Campus



Characteristic	Patients (n=100)	
Age	34 years old	
Race		
African American	89%	
Caucasian	11%	
Weight	80.5 kg	
Height	64 inches	
Antibiotic Allergies (26%)		
Penicillin	54%	
Sulfa	35%	

Characteristic	Patients (n=100)	
Chief Complaint		
Dysuria	51%	
Frequency	46%	
Suprapubic/back pain	25%	
Urgency	21%	
Abdominal pain	21%	
Diagnosis		
Acute cystitis with hematuria	63%	
Acute cystitis without hematuria	23%	
Cystitis	8%	

Characteristic	Patients (n=100)	
Seen by NP or PA	76%	
Seen by MD	24%	
Temperature	36.8°C	
Blood Pressure	131/78 mmHg	
Heart Rate	86 bpm	
Labs (24%)		
White blood cells	8.2 cell/mm ³	
Serum Creatinine	0.79 mg/dL	
Creatinine Clearance	111 mL/min	
Glucose	103 mg/dL	

Characteristic	Patients (n=100)	
Urinalysis (WBC)		
> 50 cells	76%	
21-50 cells	14%	
11-21 cells	10%	
Bacteria		
Escherichia coli	81% (ESBL-3%)	
Citrobacter koseri	7%	
Enterobacter aerogenes	7%	
Klebsiella pneumoniae	3%	
Proteus miralbilis	2%	

Results

	Patients (n=100)	
Primary Outcome		
Adherence to outpatient BJC protocol	9%	
Secondary Outcomes		
Comparison of prescribed antibiotics to available urine cultures	16% resistant	
Incidence of prolonged duration of therapy	81%	
Incidence of fluoroquinolone use	23%	

Results

	Patients (n=100)	
Antibiotic		
Nitrofurantoin	36%	
Sulfamethoxazole-trimethoprim	36%	
Ciprofloxacin	24%	
Duration of Therapy		
5 Days	16%	
7 Days	57%	
10 Days	23%	

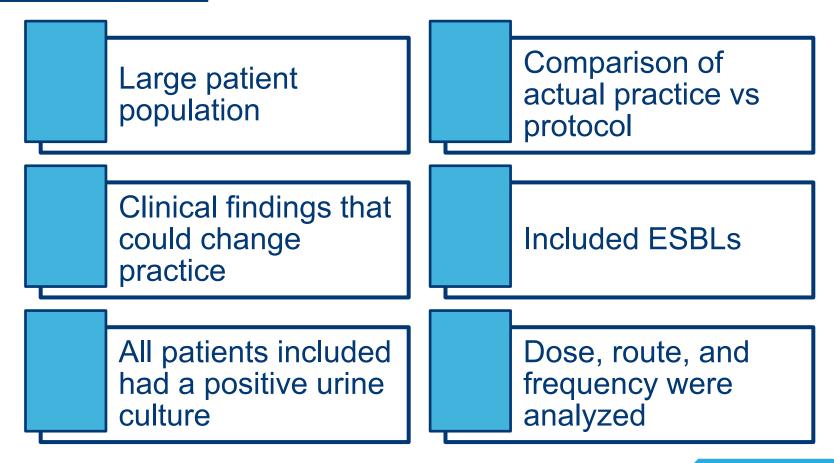
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Results

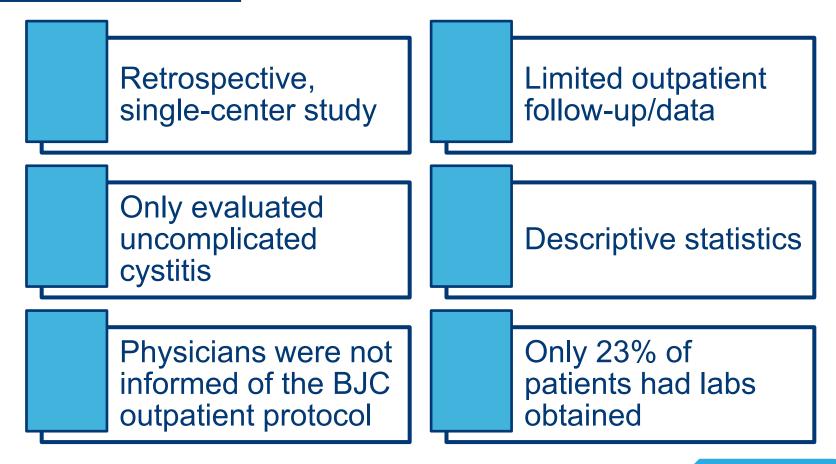
	Patients (n=16)	
Resistant Empiric Antibiotics		
Sulfamethoxazole-trimethoprim	56% (9)	
Ciprofloxacin	31% (5)	
Nitrofurantoin	13% (2)	
Resistant Bacteria		
Escherichia coli (ESBL-3)	94% (15)	
Sulfamethoxazole-trimethoprim	60% (9)	
Ciprofloxacin	33% (5)	
Nitrofurantoin	7% (1)	

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Strengths



Limitations



Discussion

- Patients who were prescribed sulfamethoxazole-trimethoprim or ciprofloxacin for uncomplicated cystitis were 86% more likely to be resistant to therapy when compared to nitrofurantoin.
- 81% of patients received a prolonged duration of therapy by 2-5 days.

Discussion

- Increasing the use of nitrofurantoin and cephalexin would decrease the rates of resistant empiric antibiotics.
- Is education for ED providers enough or does there need to be an order set built for current & future use?
- An antibiogram based on the 100 positive cultures will be made for ED use.

Conclusion

Christian Hospital could benefit from adopting the BJC outpatient protocol for uncomplicated cystitis. This would decrease prescribing resistant antibiotics, ensure the appropriate duration of therapy, and decrease the use of fluoroquinolones.



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