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Impact of a urinary tract infection treatment pathway on antimicrobial prescribing within a community hospital

Alyssa Donadio
Baptist Hospital of Miami, AlyssaD@baptisthealth.net

Heidi Clarke
Baptist Hospital of Miami, heidic@baptisthealth.net

Erika Dittmar
Baptist Hospital of Miami, erikaco@baptisthealth.net

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Alyssa Donadio, Pharm.D., BCPS; Heidi Clarke, Pharm.D., BCCCP; Erika Dittmar, Pharm.D., BCPS
Baptist Hospital of Miami, Department of Pharmacy; Miami, FL

Background

Treatment algorithms and clinical practice guidelines are often implemented within healthcare institutions as measures to reduce healthcare costs while improving patient outcomes. As antibiotic resistance rates continue to rise and therapeutic options remain limited, urinary tract infections (UTIs) represent a growing public health concern.

Based on the institutional formulary, clinical experience, local resistance patterns, and consensus guidelines, the P&T Committee at Baptist Health South Florida agreed upon an evidence-based treatment pathway for UTIs to be used as guidance for empiric antibiotic treatment. The goal of this study was to assess whether this pathway is an effective antibiotic stewardship effort to promote appropriate antibiotic use.

Purpose

To evaluate appropriateness of antibiotic selection and duration of treatment for urinary tract infections (UTIs) before and after implementation of a treatment pathway within Baptist Hospital of Miami.

Methods

- Bi-phasic, IRB approved study conducted on adult patients admitted to Baptist Hospital of Miami
- Phase I was a retrospective chart review of 50 randomly selected patients admitted with a UTI between November 2016 and October 2017
- Phase II was a prospective review of 50 patients with a positive urine culture between January 2018 and March 2018, after implementation of the UTI treatment pathway
- Exclusion criteria:
  - Febrile neutropenia
  - Acute bacterial prostatitis
  - Coexisting infections
- Primary outcome: Percent of patients who received optimal empiric antibiotic treatment and duration of therapy before and after implementation of the pathway
- Secondary outcome: length of stay before and after pathway
- Appropriateness of antibiotic therapy was defined by the P&T approved treatment algorithm

Demographics

	Phase I (n=50)	Phase II (n=50)	p value
Patient characteristics			
Average age, years	76	73	0.14
Gender—female, n (%)	37 (74%)	32 (64%)	0.28
Average baseline WBC count x10^9/L	10.3	11.2	0.30
UTI category			
Asymptomatic bacteriuria, n (%)	2 (4)	2 (4)	1.00
Acute uncomplicated cystitis, n (%)	12 (24)	13 (26)	0.82
Uncomplicated pyelonephritis, n (%)	14 (28)	12 (24)	0.65
Severe and/or complicated UTI, n (%)	22 (44)	23 (46)	0.84
ID Consult, n (%)	20 (40)	24 (48)	0.42

Outcomes

	Phase I (n=50)	Phase II (n=50)	p value
Primary Outcome			
Optimal antibiotic & duration, n (%)	15 (30)	29 (58)	0.005
Optimal empiric antibiotic, n (%)	27 (54)	38 (76)	0.02
Optimal antibiotic duration, n (%)	27 (54)	37 (74)	0.038
Secondary Outcome			
Average length of stay, days	7.8	6.4	0.66
Overall Outcomes			
Average duration of therapy, days	8	6.7	0.03
Total days of antibiotic therapy	392	331	-
Opportunity for earlier IV to PO conversion, n (%)	19 (38)	9 (18)	0.03

Appropriateness of Antibiotic by UTI Category	Phase I (n=50)	Phase II (n=50)	p value
Asymptomatic bacteriuria, n (%)	0/2 (0%)	1/2 (50%)	0.32
Uncomplicated cystitis, n (%)	9/12 (75%)	13/13 (100%)	0.06
Uncomplicated pyelonephritis, n (%)	12/14 (86%)	12/12 (100%)	0.19
Severe and/or complicated UTI, n (%)	6/22 (27%)	12/23 (52%)	0.09

Results

- There were no significant differences in baseline characteristic between the two groups
- The majority of patients were female and had a diagnosis of severe and/or complicated UTI
- For the primary outcome of optimal antibiotic selection and duration of therapy, 15 (30%) of the patients in phase I prior to pathway implementation were treated appropriately according to the algorithm, while 29 (58%) of patients were treated appropriately in phase II after pathway implementation (p=0.05)
- For the secondary outcome, average length of stay was reduced from 7.8 days in phase I to 6.7 days in phase II, although this difference was not found to be statistically significant (p=0.66)
- Average duration of therapy was reduced from 8 days during phase I to 6.7 days in phase II, which was statistically significant (p=0.03)

Conclusion

Implementation of a UTI treatment pathway improved appropriate empiric antimicrobial use, reduced average length of stay, and reduced average duration of antimicrobial therapy, thus favoring patient outcomes and healthcare costs.

References

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Disclosure

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