Evaluation of Multifaceted Antimicrobial Stewardship Interventions on the Treatment of Asymptomatic Bacteriuria

HONORHEALTH

IDWeek 2020
Poster #909968
tpham@midwestern.edu

Tho Pham, PharmD[1,2]; Angela Huang, PharmD, BCIDP[2]; Vanthida Huang, PharmD, BSPHM, FCCP[1,2]; Scott Hall, PharmD, BCPS[2]
[1]Midwestern University College of Pharmacy-Glendale Campus, Glendale, AZ; [2]HonorHealth John C. Lincoln Medical Center, Phoenix, AZ

MIDWESTERN UNIVERSITY

BACKGROUND

- Asymptomatic bacteriuria (ASB) is the leading cause of inappropriate antibiotic use in hospitals[1-2]
- In addition to its high prevalence, asymptomatic candiduria (ASC) is often overly treated with antifungal therapy[3]
- Inappropriate treatment of ASB/ASC is associated with poor outcomes such as *Clostridioides difficile* infection (CDI), longer length of stay, and long-term antibiotic resistance, etc.[2-7]

METHODS

Single center, retrospective chart review of pre-post intervention study at HonorHealth John C Lincoln Medical Center

Pre-group	Post-group
Jan – Mar 2019	Jan – Mar 2020

Inclusion: Hospitalized adults (≥ 18 years old) with a positive urinary analysis (UA) and/or urine culture with or without antimicrobial/ antifungal therapy

Exclusion: sepsis or septic shock, active urinary tract infection, immunocompromised (HIV, solid organ transplant within one year, neutropenia, and use of immunosuppressive), invasive urologic surgery with risks of mucosal trauma or urinary instrumentation, continuation of antimicrobial therapy for treatment of UTI prior to admission, concomitant antibiotics for other infections that also covered bacterial species found in the urine culture, and hospice orders

Outcomes:
Primary: Number of antibiotic days
Secondary:
- Incidence of ASB/ASC treatment
- 30-day mortality, 30-day readmission rate, sepsis
- Length of hospital stay from the index culture
- ADEs (CDI, antibiotic discontinue due to reactions)

INTERVENTIONS

The Antimicrobial Stewardship (AMS) team employed a multifaceted approach to promote appropriate management of ASB/ASC
Education:
- Presentations to physicians and pharmacists
- Distribution of step-wise treatment algorithm
Prospective audit and feedback:
- Antimicrobial Stewardship team performed active interventions for patients with ASB/ASC to recommend cessation of therapy

RESULTS

Table 1. Baseline Patient Characteristics

Characteristics	Pre-group (n = 189)	Post-group (n = 110)	P value
Age, y, median (IQR)	77 (58-86)	72 (57-83)	0.11
Sex, female (%)	149 (78.8)	83 (75.5)	0.57
Charlson comorbidity score, median (IQR)	4 (3-5)	4 (2-5)	0.46
Residency status, no.(%)			
Private, no.(%)	154 (81.5)	98 (89)	0.099
Assisted living, no.(%)	27 (14.3)	12 (10.9)	0.47
Skilled nursing home, no.(%)	8 (4.2)	0	0.03
Chronic indwelling catheter at baseline, no.(%)	15 (7.9)	4 (3.6)	0.15
Underlying psychologic disorder, no.(%)	42 (22.2)	17 (15.5)	0.18
ID specialist consult, no.(%)	9 (4.8)	5 (4.5)	1.00
Positive urine culture, no.(%)	143 (75.7)	108 (98.2)	< 0.001
Source of urine culture, no.(%)			
Clean catch, no.(%)	146 (77.2)	80 (74.1)	0.40
Straight catheterization, no.(%)	15 (8.2)	9 (8.3)	1.00
Undocumented, no.(%)	14 (7.6)	10 (9.5)	0.66
New indwelling catheterization (< 24hr), no.(%)	10 (5.4)	10 (9.3)	0.23
Urinary collection bag, no.(%)	2 (1.1)	0 (0)	1.00
Suprapubic aspiration, no.(%)	2 (1.1)	0 (0)	1.00

Table 2. Primary Outcome

Outcome	Pre-group (n=189)	Post-group (n=110)	P-value
ASB treatment duration, days (IQR)	3 (1-7)	0 (0-3)	<0.001

Table 3. Secondary Outcomes

Outcome	Pre-group (n=189)	Post-group (n=110)	P-value
Incidence of treatment of ASB, n (%)	137 (85.1)	50 (45.5)	< 0.001
30-d mortality	0 (0)	0 (0)	1.00
30-d readmission rate	0 (0)	0 (0)	1.00
Total hospital days from a positive urine culture	4 (3-6)	5 (3-7)	0.73
Sepsis from an untreated positive urine culture (<48h)	0 (0)	0 (0)	1.00
Adverse events			
CDI, n.(%)	1	1	1.00
Antibiotic discontinuation or change, n.(%)	1	0	1.00

Antimicrobial Stewardship (AMS) interventions
- A total of 34 interventions were made, with an acceptance rate of 64.7%
- Among the accepted interventions (n=22):
  - 20 (90.9%) were discontinuation of therapy
  - 2 (9.1%) were shortened duration of treatment

CONCLUSION

- Inappropriate treatment of ASB/ASC, measured by the number of antibiotic days, was successfully decreased
- Incidence of ASB treatment was significantly reduced
- No statistically significant difference in mortality and readmission rate was observed in post-group

AUTHOR DISCLOSURES

REFERENCES

(1) CDC. Antibiotic use in the United States, 2018 update: progress and opportunities. Atlanta, GA: US Department of Health and Human Services, CDC; 2019.
(2) Nicolle LE, Gupta K, Bradley SF et al. Clinical practice guideline for the management of asymptomatic bacteriuria: 2019 update by the Infectious Society of America. Clin Infect Dis. 2019; 68(10):83-110.
(3) Fisher JF, Sobel JD, Kauffman CA, Newman CA. Candida urinary tract infections - treatment. Clin Infect Dis. 2011; 52 suppl 6:s457-66.
(4) Dasgupta A, Brymer C, Elsayed S. Treatment of asymptomatic UTI in older delirious medical in-patients: a prospective cohort study. Arch Gerontol Geriatr. 2017; 72:127-134.
(5) Walker S, McGeer A, Simor AE et al. Why are antibiotics prescribed for asymptomatic bacteriuria in institutionalized elderly people? A qualitative study of physicians' and nurses' perceptions. CMAJ. 2000; 163:273-277.
(6) Cope M, Cevallos ME, Cadle H et al. Inappropriate treatment of catheter-associated asymptomatic bacteriuria in a tertiary care hospital. Clin Infect Dis. 2009; 1;48(9):1182-8.
(7) Trautner B, Grigoryan L, Petersen H, et al. Effectiveness of an Antimicrobial Stewardship Approach for Urinary Catheter-Associated Asymptomatic Bacteriuria. JAMA Intern Med. 2015 Jul;175(7):1120-7