A Pre- and Post-Intervention Study to Implement a Successful Antimicrobial Stewardship Program in Palliative Care

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INTRODUCTION

- Appropriate use of antimicrobials in palliative care is unclear, as available data on the comfort provided by antimicrobials is lacking. Antimicrobials are associated with improvement in patient comfort - such as improvement in pain - in the treatment of urinary tract infections, viral infections such as herpes simplex and varicella zoster, and oral candidiasis, but have not been clearly linked to improvement in comfort in patients with infections such as pneumonia or bacteremia.[1]
- Infectious Diseases Society of America guidelines for antimicrobial stewardship programs highlight antimicrobials as aggressive treatment and recommend stewardship support in the management of terminally ill patients to reduce treatment burden, adverse effects such as *C. difficile* diarrhea, and the development of antimicrobial resistance.[2]
- Data characterizing the use of antimicrobial agents in palliative care patients is limited, and data on the impact of an antimicrobial stewardship program in this population is equally lacking.

OBJECTIVES

- To assess antimicrobial use in patients who expired at a University Hospital
- To determine the success of targeted antimicrobial stewardship interventions in patients receiving palliative care

METHODS

- Singe-centered, pre- and post-intervention retrospective study
- Retrospective review of antimicrobial use during the last 14 days of life of patients who expired between November 2018 and August 2019
- Prospective stewardship initiative beginning in January 2020 in collaboration with palliative care services
- Inclusion criteria
  - Pre-intervention: 18 years of age or older, expiration during admission
  - Post-intervention: 18 years of age or older, palliative care consult, antimicrobials
- Exclusion criteria
  - Pre-intervention: expiration less than 48 hours after admission
- Outcomes
  - Assessment of appropriateness of antimicrobial use in the final 14 days of life of patients based on guideline recommendations
  - Assessment of acceptance rate of stewardship interventions in palliative care patients

RESULTS

Table 1. Baseline Characteristics – Pre-intervention

	All (n = 200)	No antimicrobials (n = 61)	Received antimicrobials (n = 139)
Age, median (IQR)	74 (61 – 82)	74 (60 – 82)	74 (61 – 82)
Male, n (%)	91 (45.5)	29 (47.5)	62 (44.6)
Code status on admission			
Full Code	160 (80)	46 (75.4)	114 (82)
DNR/DNI	40 (20)	15 (24.6)	25 (18)
Median length of stay, days (IQR)	9 (6 – 16)	8 (5 – 14)	10 (6 – 17)
Palliative care consult, n (%)	100 (50)	34 (55.7)	66 (47.5)
Advancement of code status, n (%)			
To DNR/DNI	68	21	47
To CMO	40	14	26

Table 2. Antimicrobial Use – Pre-intervention (n = 139)

Days of therapy (DOT), median (IQR)	9.5 (6 – 14)
Median DOT with palliative care	8.5 (6 – 13)
Median DOT without palliative care	10 (7 – 14)
Documented indication, n (%)	
Bacteremia	14 (10.1)
Cellulitis	10 (7.2)
Empiric/Sepsis	34 (24.5)
Intraabdominal	11 (7.9)
Osteomyelitis	2 (1.4)
Pneumonia	48 (34.5)
Urinary tract infection	20 (14.4)
Route of administration, n (%)	
Intravenous (IV)	138 (99.3)
Both intravenous (IV) and oral (PO)	10 (7.2)
Oral (PO)	1 (0.72)
Specific antimicrobials	
Ampicillin	1 (0.72)
Ampicillin-sulbactam	8 (5.8)
Azithromycin	26 (18.7)
Cefazolin	2 (1.4)
Cefepime	16 (11.5)
Ceftazidime	1 (0.72)
Ceftolozane-tazobactam	1 (0.72)
Ceftriaxone	33 (23.7)
Clindamycin	3 (2.2)
Daptomycin	2 (1.4)
Doxycycline	1 (0.72)
Fluconazole	5 (3.6)
Levofloxacin	8 (5.8)
Linezolid	5 (3.6)
Meropenem	11 (7.9)
Metronidazole	21 (15.1)
Micafungin	5 (3.6)
Nafcillin	3 (2.2)
Piperacillin-tazobactam	90 (64.7)
Vancomycin	84 (60.4)

Table 3. Pre-intervention Regimens (n = 139)

Optimization of therapy	
Regimen optimal, n (%)	75 (54)
Regimen not optimal, n (%)	64 (46)
Potential stewardship interventions, n = 64	
Asymptomatic UTI	4 (6.3)
Choice of agent	11 (17.2)
De-escalation possible	21 (32.8)
Duplicate coverage	1 (1.6)
Duration	2 (3.1)
Empiric therapy	20 (31.3)
Unnecessary coverage	5 (7.8)

Table 4. Antimicrobial Use – Post-intervention

Total patients	13
Documented indication	
Bacteremia	1
Cellulitis	2
Empiric/Sepsis	1
Pneumonia	6
Urinary tract infection	3
Route of administration	
Intravenous (IV)	20
Oral (PO)	0
Specific antimicrobials	
Azithromycin	2
Cefepime	2
Ceftriaxone	5
Clindamycin	1
Daptomycin	1
Meropenem	1
Metronidazole	1
Piperacillin-tazobactam	4
Vancomycin	3

Disclosure
Authors of this presentation have the nothing to disclose concerning possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation

RESULTS, CONT'D

Table 5. Post-intervention Stewardship Efforts

Total interventions	16	
	Accepted	Not accepted
De-escalation	1	1
Discontinuation	3	1
Dose adjustment	2	0
Duration of therapy	5	0
Regimen optimization	2	1
Total	13 (81.25%)	3 (18.75%)

DISCUSSION

- In the pre-intervention portion, we found the most frequent indications for antimicrobials in the last 14 days of life to be pneumonia or empiric/sepsis. Over half of regimens could have been improved or optimized through antimicrobial stewardship recommendations (54%).
  - Trends were seen toward longer length of stay for patients receiving antimicrobials and decreased days of therapy (DOT) in patients with palliative care consults.
- During the post-intervention portion, we assessed physician understanding of the role of antimicrobials in palliative care, and emphasized the inclusion of antimicrobials in goals of care discussions.
- In the post-intervention portion, we had a high acceptance rate of stewardship interventions (81.25%), most often related to duration of therapy and discontinuation of antimicrobials when patients moved to comfort measures only.

LIMITATIONS

- Retrospective nature of pre-intervention portion
- Data collection in post-intervention portion limited due to SARS-CoV-2 pandemic
- Duration of study limited abilities to collect data on adverse effects of antimicrobials
- Number of patients included limited ability to perform statistical analysis

CONCLUSION

- Our study found a prevalent misuse of antimicrobials in patients during end-of-life, with clear room for improvement through antimicrobial stewardship intervention, and a high overall provider acceptance rate of these interventions.

REFERENCES

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