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Perspectives on Antimicrobial Use at the End of Life among Antibiotic Stewardship Programs: A Survey of the Society for Healthcare Epidemiology of America Research Network

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Introduction

The decision to administer antimicrobials at the end of life is challenging. End-of-life antimicrobials may be offered to meet family expectations, avoid perceptions of “giving up,” and reduce pain.¹ However, there is weak evidence supporting antimicrobial use to achieve symptom relief and strong evidence of antimicrobial-associated harms.^{2–5} Although guidelines suggest antibiotic stewardship programs (ASPs) should support clinicians in decisions regarding end-of-life antimicrobial use,⁶ current practices remain unknown. We surveyed ASPs to evaluate perspectives on end-of-life antimicrobial use.

Methods

We conducted an electronic survey of ASPs from the SHEA Research Network, a consortium of hospitals collaborating on multicenter projects in healthcare epidemiology. There were no exclusion criteria, and participation was voluntary. This study was considered not human subjects research by the Yale Human Investigation Committee.

Participants were informed that the survey intended to study perspectives on antimicrobial use during end-of-life care of hospitalized patients. Using a case vignette, end-of-life care was defined as the care of a patient whose goals of care do not include escalation, but comfort measures have not yet been implemented (Supplement 1). Participants were asked about ASP practices regarding end-of-life care, institutional guidelines, and drug approval according to a patient’s code status. One open-ended question assessed how ASPs should support clinicians during end-of-life care.

The survey was sent on May 17, 2018, and submissions closed on June 22, 2018. Responses were maintained using Microsoft Excel Software. Free text responses were summarized.

Results

Members of 36 of 94 eligible hospitals completed the survey (response rate, 38%). Of these, 21 (58%) were academic centers. There was a wide range of beds [7 (19%) had 300; 14 (39%) had 301–600; 5 (14%) had 601–900; 10 (28%) had 901] and medical/surgical intensive care units [15 (42%) had 4; 13 (36%) had 5–8; 8 (22%) had 9]. All hospitals had an ASP, and 27 (75%) had 1 full-time equivalent physician dedicated to antibiotic stewardship. Pharmacist data were unavailable.

Overall, 23 (64%) hospitals had ASPs that monitored antimicrobial use in patients during end-of-life care (Table 1). Approval of antimicrobials appeared to be influenced by patient goals of care: do not resuscitate/intubate [n=4/36, 11%]; no escalation of care [n=9/36, 25%]; comfort measure only [n=15/36, 42%]. Only 13 (36%) hospitals had ASPs that offered guidance for patients receiving comfort measures only.

Free text responses indicated that ASPs should support clinicians with: 1) discerning antimicrobial-associated adverse effects: representative comments included, “If the antibiotic side effects don’t support [patient dignity and ease of suffering], then they need to be stopped, whether oral or [intravenous],” 2) supporting palliative care providers: representative comments included, “support the recommendations of palliative care physicians during end-of-life discussions...antimicrobials can be seen as similar to intubation or cardiac resuscitation as a death prolonging measure as opposed to a palliative one...” 3) refining guidelines: representative comments included, “development of more formalized guidelines for helping all providers with decision-making about antibiotics not only for in hospital palliative care but also when transitioning to hospice;” and “[d]evelopment of clear guidelines, ideally within already developed plans for end-of-life management;” and 4) educating clinicians: representative comments included, “provide clinicians with education, advice, and guidance regarding appropriate antibiotic use...[and] how the end-of-life time period affects risks and benefits of antibiotic use.”

Discussion

This survey shows that approximately one-third of ASPs offer guidance for inpatients receiving comfort care, and recommendations for intravenous antimicrobials are more common than recommendations for oral antimicrobials in 86% of programs. Notably, approval of antimicrobials was often influenced by patient goals of care, and few ASPs engage palliative care practitioners through educational activities. Collectively, our findings suggest ASPs may support end-of-life care by providing education and guidance on optimal antimicrobial regimens that promote patient-centered goals of care.

We identified key areas for ASP efforts during end-of-life care. Respondents favor increased collaboration between ASPs and palliative care practitioners through education regarding the importance of de-escalation, appropriate duration, and the potential for adverse effects. ASPs can further serve as consultants for palliative care teams when contemplating the

discontinuation of antimicrobial therapy. Additional activities may include education regarding optimal agents to facilitate discharge to home or hospice.⁷

Our data suggest criteria are needed to support the assessment of the potential risks versus benefits of end-of-life antimicrobial use. Benefits of end-of-life antimicrobial use may be observed with topical metronidazole for malodorous wounds, nystatin for thrush, and oral vancomycin for *Clostridioides difficile* infection. In contrast, given the limited data on symptom relief, the potential risks of antimicrobials may be prohibitive in patients receiving comfort care.² ASPs may also consider integrating antimicrobials into institutional end-of-life care guidelines, a practice that was adopted by only 14% of surveyed hospitals, and reviewing whether antimicrobials align with end-of-life treatment preferences.⁸

This study has limitations. First, responses may have been provided by participants unaffiliated with their institution's ASP. However, the SHEA Research Network investigator was encouraged to forward the survey to an ASP participant. Second, the interpretation of end-of-life care may have varied. Finally, the number of participants was low. Further data are needed to understand ASP practices in U.S. hospitals.

In conclusion, a minority of ASPs intervene on oral antimicrobials during end-of-life care or provide guidance for patients receiving comfort care. Educational collaborations between ASPs and palliative care practitioners are lacking, and institutional end-of-life care guidelines rarely include antimicrobials. Comparative studies evaluating the impact of educational interventions on the duration of antimicrobial use among hospitalized populations at the end of life are warranted.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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References

1. Gaw CE, Hamilton KW, Gerber JS, Szymczak JE. Physician Perceptions Regarding Antimicrobial Use in End-of-Life Care. *Infection Control & Hospital Epidemiology*. 2018;39(4):383–390. [PubMed: 29428002]
2. Rosenberg JH, Albrecht JS, Fromme EK, et al. Antimicrobial use for symptom management in patients receiving hospice and palliative care: a systematic review. *Journal of Palliative Medicine*. 2013;16(12):1568–1574. [PubMed: 24151960]
3. Levin PD, Simor AE, Moses AE, Sprung CL. End-of-life treatment and bacterial antibiotic resistance: a potential association. *Chest*. 2010;138(3):588–594. [PubMed: 20472860]
4. White PH, Kuhlenschmidt HL, Vancura BG, Navari RM. Antimicrobial Use in Patients with Advanced Cancer Receiving Hospice Care. *Journal of Pain and Symptom Management*. 2003;25(5):438–443. [PubMed: 12727041]
5. Datta R, Zhu M, Han L, Allore H, Quagliarello V, Juthani-Mehta M. Increased Length of Stay Associated with Antibiotic Use in Older Adults with Advanced Cancer Transitioned to Comfort Measures. *American Journal of Hospice and Palliative Medicine*. 2019; In Press.

6. Barlam TF, Cosgrove SE, Abbo LM, et al. Implementing an Antibiotic Stewardship Program: Guidelines by the Infectious Diseases Society of America and the Society for Healthcare Epidemiology of America. *Clinical Infectious Diseases*. 2016;62(10):e51–77. [PubMed: 27080992]
7. Datta R, McManus D, Topal J, Juthani-Mehta M. Long-Acting Lipoglycopeptides for Gram-Positive Bacteremia at the End of Life to Facilitate Hospice Care: A Report of 3 Cases. *Open Forum Infectious Diseases*. 2018;5(1):ofx277. [PubMed: 29399598]
8. Hickman SE, Keevern E, Hammes BJ. Use of the Physician Orders for Life-Sustaining Treatment Program in the Clinical Setting: A Systematic Review of the Literature. *Journal of the American Geriatrics Society*. 2015;63(2):341–350. [PubMed: 25644280]

Table 1.

Characteristics of antibiotic stewardship programs with respect to antimicrobial use during end-of-life (EOL) care among 36 hospitals.

Characteristic	N	%
Respondent Years of Practice in Antibiotic Stewardship		
<5 years	3	8%
5 to 15 years	17	47%
>15 years	16	44%
Institution with Dedicated Palliative Care Practitioner		
Yes	33	92%
No	2	6%
Don't know	1	3%
Antibiotic Stewardship Education for Palliative Care Practitioner		
Yes	3	8%
No	23	64%
Don't know	10	28%
Antibiotic Stewardship Recommendations Recorded in Medical Record		
Yes ^a	15	42%
No	21	58%
Don't know	0	0%
Antibiotic Stewardship Program Monitors EOL Patients		
Yes	23	64%
No	8	22%
Don't know	5	14%
Formal EOL Care Guidelines Provided by Antibiotic Stewardship		
Yes	3	8%
No	29	81%
Don't know	4	11%
Antibiotic Stewardship Guidance for Comfort Care Patients		
Yes	13	36%
No	15	42%
Don't know	8	22%
Institution Provides EOL Care Guidelines		
Yes	21	58%
No	11	31%
Don't know	4	11%
Institutional EOL Care Guidelines Address Antimicrobial Use^b		
Yes	3	14%
No	12	57%
Don't know	6	29%
Antibiotic Stewardship Program Intervenes on Oral EOL Antimicrobials		
Yes	14	39%

Characteristic	N	%
No	21	58%
Don't know	1	3%
Recommendations for Intravenous Antimicrobials More Common than Oral Antimicrobials		
Yes	31	86%
No	1	3%
Don't know	4	11%
More Difficult to Deny Restricted Antimicrobials at EOL		
Yes	6	17%
No	26	72%
Don't know	4	11%
Approval of Restricted Antimicrobials Impacted By:		
Code Status of Do Not Resuscitate or Do Not Intubate		
Yes	4	11%
No	30	83%
Don't know	2	6%
Clinical Status of No Escalation of Care		
Yes	9	25%
No	22	61%
Don't know	5	14%
Code Status of Comfort Measures Only		
Yes	15	42%
No	19	53%
Don't know	2	6%

^aAntibiotic stewardship recommendations followed “most of the time” in 14 of these hospitals

^bDenominator includes the 21 hospitals that provide institutional EOL care guidelines