FAST FACTS AND CONCEPTS #351
ANTIMICROBIAL THERAPY AT THE END OF LIFE
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Introduction  Nearly 50% of patients approaching the end of life have an infection (1,2). Yet, the use of antimicrobial therapy in this patient population is controversial, as the clinical benefits are unclear. In the absence of evidence-based guidelines, this Fast Fact offers a framework for antimicrobial use in terminally ill patients.

Patient's Prognosis versus Antimicrobial's Time to Effect  When deciding whether to treat an infection, it is important to weigh the patient’s prognosis from the underlying illness, the time it takes for the antimicrobials to work, their impact on prognosis, available routes of administration, and anticipated side effects. Time to effect varies significantly depending on the causative organism, site of infection, and antimicrobial medication. For example, a five-day course of nitrofurantoin may lead to symptom relief from urinary tract infection (UTI) in days, but osteomyelitis may require weeks of intravenous antimicrobial therapy to relieve symptoms (3,4).

Aligning the Goals of Antimicrobial Therapy to the Patient and Family's Goals of Care  The goals of antimicrobial therapy do not always align with the patient’s or family’s overall goals of care. Patients and clinicians may not be aware of the following findings in the published medical literature:

1. Antimicrobial therapy has not been shown to provide consistent symptomatic relief in dying adults. In a 2013 systematic review that analyzed the symptom response following administration of an antimicrobial via many routes for patients receiving hospice or palliative care, improvement varied from 21.4% to 56.7% of cases. Symptomatic improvement may be more likely for UTIs (60-92% symptomatic response) than for respiratory tract infections (0-53% symptomatic response). There was no observed symptom improvement among patients with bacteremia. This data was weakened due to the lack of controlled studies comparing outcomes between patients who did and did not receive antimicrobials, and the heterogeneity in the measurement of symptom burden and reduction (5). Also, this data may not apply for pediatric patients, particularly those with otitis media, who often get prompt symptom relief from antibiotics.

2. When prognosis is anticipated to be weeks to months, there is little evidence that antimicrobials provide significant survival benefit (6). A 2003 prospective study of 255 adults with advanced cancer did not find a survival difference between those who chose either “full use” of antimicrobials, avoidance of antimicrobials entirely, or acceptance of antimicrobials only when there were symptoms attributed to an infection (7). Another study of inpatient adults in a palliative care unit did not find a significant survival difference for adults with an identified bacterial infection (8). On the other hand, when prognosis from the underlying illness is anticipated to be longer (e.g. months to a year), antibiotics may offer a survival benefit, as shown in a prospective study of 323 nursing home residents with advanced dementia, wherein antibiotics for pneumonia was associated with a 273-day survival benefit (9).

3. Antimicrobials are not the only therapeutic option for managing infection-related symptoms. For example, dyspnea secondary to a respiratory infection may respond to opioids; an antitussive may alleviate bronchitis-associated cough; an otic suspension may help alleviate otalgia from otitis media; pyridium may help relieve bladder spasms secondary to a UTI; and antipyretics may alleviate symptoms from a fever (10).

Potential Harms of Antimicrobial Therapy

- Adverse effects: a 2017 retrospective review of 1488 in-patients who received at least 24 hours of antibiotics reported at least one adverse event in 20% of patients, with a total of 324 adverse drug events (10). Antimicrobial-associated diarrhea is especially prevalent in patients with terminal illness (11), and an association between beta-lactams and seizures has been described (12).
- Burdens related to route of administration: The use of intravenous antimicrobials carry the risk of phlebitis, local soft tissue infections and secondary bacteremia. Oral antimicrobials can be difficult for patients at the end of life especially if they need to be taken on an empty stomach or separated from other medications.
- Cost: Antimicrobial therapy can be expensive. For example, seven days of intravenous piperacillin/tazobactam therapy can cost upwards of $500. This can complicate the care plans of patients considering hospice (see Fast Fact #90).

Conclusion  The decision to prescribe antimicrobial therapy in patients near the end of life should be driven by the type of infection being treated, goals of care, and anticipated prognosis from the underlying illness. For
patients with comfort goals of care and an estimated prognosis of weeks or less, antimicrobial therapy should be limited. While, symptomatic control of a UTI or otitis media are reasonable indications in this patient population, symptomatic relief of a pneumonia is less realistic based on the current data.

References

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