

Antibiotic De-escalation in Culture-negative Healthcare-associated Pneumonia



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Introduction

Hospitalists often encounter situations where a patient is admitted with diagnosis of health-care associated pneumonia (HCAP), is placed on broad spectrum intravenous antibiotics and after two or three days the patient is clinically stable for discharge but the cultures and other work up don't reveal an organism. What do we do? The guidelines from the American Thoracic Society (ATS) and the Infectious Disease Society of America (IDSA) recommend "early, appropriate antibiotics in adequate doses, while avoiding excessive antibiotics by de-escalation of initial antibiotic therapy, based on microbiologic cultures and the clinical response of the patient, and shortening the duration of therapy to the minimum effective period"¹. But they offer no recommendations on how to de-escalate when the cultures are negative. They do mention that if lower respiratory tract cultures obtained before antibiotics are negative at 48-72 hours, discontinuation of antibiotics can be considered. However, unless the patient is intubated (i.e. intensive care setting), we are usually unable to obtain lower respiratory tract cultures. Are we then bound to finish the course of antibiotics with the initial empiric regimen or can we de-escalate?

Definition

The term HCAP was introduced in the ATS/IDSA guidelines in 2005. HCAP is defined as pneumonia occurring in outpatients who had contact with the health care system and are therefore at risk of infections with resistant pathogens. HCAP includes any patient with pneumonia who was hospitalized in an acute care hospital for two or more days within 90 days of the infection; resided in a nursing home or long-term care facility; received recent intravenous antibiotic therapy, chemotherapy, or wound care within the past 30 days of the current infection; or attended a hemodialysis clinic¹. According to the same guidelines, other

risk factors for resistant pathogens are: antimicrobial therapy in preceding 90 days, high frequency of antibiotic resistance in the community or in the specific hospital unit, a family member with resistant pathogen, and immunosuppression.

Etiology, empiric therapy and duration of therapy

The organisms found in patients with risk factors for HCAP are *Pseudomonas aeruginosa*, resistant Enterobacteriaceae and methicillin-resistant *Staphylococcus aureus* (MRSA). The acronym PES has been used when referring to these organisms². This explains the recommended empiric antibiotic therapy which should include an antipseudomonal antibiotic (betalactam-betalactamase inhibitor, cephalosporin, carbapenem) plus an antipseudomonal fluoroquinolone or aminoglycoside plus an anti-MRSA antibiotic¹. The double antipseudomonal coverage is recommended as empiric therapy but once *Pseudomonas* susceptibilities are available, antibiotics can be narrowed to a single antipseudomonal agent (except for aminoglycosides which are not recommended as monotherapy for infections other than urinary tract infections). Many clinicians and researchers do not require the addition of an antipseudomonal fluoroquinolone or aminoglycoside to consider the empiric regimen appropriate for HCAP³.

However, there has been concern that broad spectrum antibiotic therapy for all patients with HCAP might be unnecessary and could increase costs and promote selection of more resistant pathogens⁴. Several researchers have stated that the HCAP criteria are poor predictors of resistant organisms and not all patients with HCAP should be empirically treated for these pathogens⁵. HCAP should probably be broken into distinct subgroups so narrow-spectrum antibiotics can be used in selected patients⁶.

In terms of duration, 7 to 8 days of therapy is recommended for patients who have received initially appropriate therapy, have had a good clinical response and have no evidence of infection by *Pseudomonas aeruginosa* (which would require 14 days of therapy)¹.

De-escalation in culture-negative HCAP

In one study, only 15.4% of patients with culture-negative HCAP received the recommended regimen per ATS/IDSA guidelines. Compared with patients with culture-negative HCAP, patients with culture-positive HCAP had greater severity of illness, hospital mortality, and a longer hospital stay. The authors suggested that patients with culture-negative HCAP may have been infected with more typical community-acquired pneumonia (CAP) pathogens³.

Another study showed that compared to CAP guideline-concordant regimens, treatment of HCAP with HCAP guideline-concordant regimens did not increase clinical cure rates⁷.

A retrospective study on practice patterns for antibiotic de-escalation in culture-negative HCAP showed that antibiotics were de-escalated in 75% of cases and that a respiratory fluoroquinolone was chosen for de-escalation 70% of the time. Culture-negative patients who were de-escalated had a shorter length of hospitalization, lower hospital costs, and lower mortality rates⁸.

The above studies suggest that antibiotics can be safely de-escalated to a CAP regimen if the cultures are negative at 48-72 hours and the patient has achieved clinical stability. Although continuation of the initial broad spectrum antibiotic regimen without de-escalation can be done in culture-negative HCAP, it is the opinion of several clinicians that a reasonable alternative is de-escalation to a CAP guideline-concordant regimen. But this decision is left to clinical judgement. Fortunately, the ATS/IDSA guidelines are currently being updated.

References

1. American Thoracic S, Infectious Diseases Society of A. Guidelines for the management of adults with hospital-acquired, ventilator-associated, and healthcare-associated pneumonia. *American journal of respiratory and critical care medicine*. Feb 15 2005;171(4):388-416.
2. Dean NC, Webb BJ. Health Care-Associated Pneumonia is Mostly Dead. Long Live the Acronym PES? *Annals of the American Thoracic Society*. Feb 2015;12(2):239-240.
3. Labelle AJ, Arnold H, Reichley RM, Micek ST, Kollef MH. A comparison of culture-positive and culture-negative health-care-associated pneumonia. *Chest*. May 2010;137(5):1130-1137.
4. Yap V, Datta D, Metersky ML. Is the present definition of health care-associated pneumonia the best way to define risk of infection with antibiotic-resistant pathogens? *Infectious disease clinics of North America*. Mar 2013;27(1):1-18.
5. Park SC, Kang YA, Park BH, et al. Poor prediction of potentially drug-resistant pathogens using current criteria of health care-associated pneumonia. *Respiratory medicine*. Sep 2012;106(9):1311-1319.
6. Yu VL. Guidelines for hospital-acquired pneumonia and health-care-associated pneumonia: a vulnerability, a pitfall, and a fatal flaw. *The Lancet infectious diseases*. Mar 2011;11(3):248-252.
7. Chen JI, Slater LN, Kurdgelashvili G, Husain KO, Gentry CA. Outcomes of health care-associated pneumonia empirically treated with guideline-concordant regimens versus community-acquired pneumonia guideline-concordant regimens for patients admitted to acute care wards from home. *The Annals of pharmacotherapy*. Jan 2013;47(1):9-19.
8. Schlueter M, James C, Dominguez A, Tsu L, Seymann G. Practice patterns for antibiotic de-escalation in culture-negative healthcare-associated pneumonia. *Infection*. Oct 2010;38(5):357-362.