Kentucky Antimicrobial Stewardship Innovation Consortium

Educational Pearl

"Sepsis" Isn't Specific Enough

Each year, approximately 1.7 million individuals in the United States will develop sepsis, and nearly 350,000 of these patients will die during their hospitalization.[1] Rapid administration of antimicrobials are a mainstay of sepsis management. In fact, mortality can increase by approximately 7% for each hour that antimicrobial administration is delayed.[2] However, when selecting antibiotics for a patient, is "sepsis" as an indication enough?

Sepsis is Not a Specific Indication

Sepsis is a dysregulated systemic inflammatory response to infection that can lead to organ dysfunction and death. Sepsis refers to the severity of infection and alone does not guide selection of antimicrobials. There is no one-size-fits-all antibiotic for the treatment of sepsis. Best practice in patient review is assessing for "sepsis secondary to _____."

Source of Sepsis Matters

The septic response presents similarly regardless of causative pathogen. Identification of a suspected specific source of infection is crucial for empiric antimicrobial selection. Causative pathogens differ according to the source of sepsis. Without investigation into the source of sepsis, the correct antimicrobial, dose, and duration remain unknown and overly broad-spectrum antimicrobials may be employed. Common sources of sepsis include lower respiratory tract infections, intra-abdominal infections, and urinary tract infections.[3] Table 1 demonstrates how pathogenic bacteria, empiric antimicrobial regimens, and durations can vary according to the suspected source of sepsis. After a suspected source is identified, other considerations such as risk factors for drug resistance and local epidemiology should also be assessed.[4]

Table 1. Empiric Antimicrobials Associated with Different Sites of Infection

Source of Sepsis	Typical Causative Organisms	Common Empiric Regimen	Duration of Therapy
Community-Acquired Pneumonia	*Streptococcus pneumoniae, Haemophilus influenzae, Moraxella catarrhalis, Mycoplasma pneumoniae, Chlamydophila pneumoniae, and Legionella pneumophila*	Ampicillin-sulbactam + Azithromycin	5 – 7 Days
Urinary Tract Infection	*Escherichia coli, Klebsiella pneumoniae, Proteus mirabilis*	Ceftriaxone	3 – 7 Days
Intra-abdominal Infection	*Escherichia coli*, *Klebsiella* spp., *Bacteroides* spp., *Streptococcus* spp.	Ceftriaxone + Metronidazole	4 days after adequate source control

Key Takeaway: Sepsis alone should not be used as a definitive antimicrobial indication. In patients with sepsis, identifying a suspected source is key in defining appropriate antibiotic management.

References:

1. https://www.cdc.gov/sepsis/what-is-sepsis.html
2. Seymour, Christopher W., et al. "Time to treatment and mortality during mandated emergency care for sepsis." New England Journal of Medicine 376.23 (2017): 2235-2244.
3. Llewelyn MJ, Cohen J. Tracking the microbes in sepsis: advancements in treatment bring challenges for microbial epidemiology. *Clin Infect Dis*. 2007;44(10):1343-1348. doi:10.1086/515403
4. Evans L, Rhodes A, Alhazzani W, et al. Surviving sepsis campaign: international guidelines for management of sepsis and septic shock 2021. *Intensive Care Med*. 2021;47(11):1181-1247. doi:10.1007/s00134-021-06506-y

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