

Week 7

Clinical Decision-Making Discussion

Case Study:

You are admitting a 78-year-old male smoker with hx of asthma into the intensive care unit for a diagnosis of hospital acquired pneumonia. He was admitted three weeks ago with pneumonia and discharged to home on azithromycin after a 2-day hospitalization. What antimicrobial treatment will you order on his ICU admission now? Explain your rationale.

Answer:

Several aspects must be considered when re-admitting an elderly (78-year-old) male smoker with a history of asthma into the ICU for a diagnosis of hospital acquired pneumonia (HAP). Admitted 3 weeks ago with the diagnosis of pneumonia and having spent 2 days at the clinical facility, the patient was discharged home on the prescribed medication of azithromycin. Before deciding on the type of antimicrobial treatment to be ordered on this patient's ICU admission, it is critical to consider the etiology of the reported issue and the concomitant factors that might exhibit additional points of consideration in the discussed case.

HAP is a hospital-borne lung infection, the onset of which starts after 48 hours of hospitalization and does not exhibit major clinical symptoms/ signs in incubation at the hospital admission. The etiology of HAP differs considerably from community-acquired pneumonia (CAP) where *Streptococcus pneumoniae*, *Mycoplasma pneumoniae*, and *Haemophilus influenzae* represent the dominant pathogens (Bussini et al., 2022). Also referred to as nosocomial pneumonia, HAP might develop due to such causative pathogens as aerobic gram-negative bacilli and gram-positive cocci (e.g., *Staphylococcus aureus*, including methicillin-resistant *S. aureus*, *Streptococcus spp*) (Shebl & Gulick, 2023). Admittedly, antibiotic-resistant pathogens are a critical concern in the given case due to the concomitant presentation of asthma. The patient's history of asthma is an aggravating factor that might exacerbate the symptoms of both asthma and HAP, entail the need for even more intensive care and invasive treatment, and further increase the length of hospital stay (Rashid et al., 2023). Besides, the patient's age and previous exposure to antibiotic treatment are to be accounted for when arranging the antimicrobial treatment during the re-hospitalization. Taken together, the enumerated factors considerably compromise the patient's respiratory health and the responsiveness of the immune system to antibiotics.

Given the above-discussed factors, it is essential to plan the antimicrobial treatment regimen according to the patient's advanced age and the presence of concomitant issues. Hence, the most feasible option to be recommended for this patient's ICU admission is Piperacillin-Tazobactam treatment. In parallel, the combination of Ceftriaxone and Clindamycin can also be considered as an alternative treatment plan for addressing the HAP case. An extensive body of clinical evidence and research suggests that the former option is effective in battling antimicrobial resistance in HAP (Park et al., 2020; World Health Organization, 2017). First and foremost, Piperacillin helps address the dominant pathogens of nosocomial pneumonia, which might be less effectively managed by pharmaceuticals with a lower degree of intensity. By adding Tazobactam, the combined efficacy of chemical agents increases due to the capacity of Tazobactam to address the beta-lactamase-mediated resistance. Hence, this option helps address the issue of increased antibiotic resistance in HAP, which might be particularly evident in the