Georgian Scientists
ქართველი მეცნიერები
Vol. 7 Issue 4(1), 2025
https://doi.org/10.52340/gs.2025.07.04(1).22

THE USE OF ANTIBIOTICS IN ICU: THE ROLE OF DE-ESCALATION THERAPY

Nia Gogitidze[1], Teimuraz Peshkov[2]

1. Department of Public Health and Basic Medicine, Avicenna – Batumi Medical University, School of Medicine, Batumi, Georgia.
2. Department of Clinical Medicine, Avicenna – Batumi Medical University, School of Medicine, Batumi, Georgia.

Early broad-spectrum antimicrobial therapy remains a cornerstone of sepsis and septic shock management, where timely adequate coverage is essential for survival. The clinical challenge emerges after stabilization: ongoing unnecessarily broad therapy accelerates multidrug-resistance development, disrupts the microbiome, increases drug toxicity risk, and inflates cost of care. Antibiotic de-escalation provides a deliberate and evidence-supported strategy to narrow the antimicrobial spectrum while preserving clinical efficacy. This presentation focuses on how to safely and confidently de-escalate therapy in the ICU, emphasizing the critical 48-72-hour reassessment window where clinical trajectory, source control, microbiologic data, and diagnostic context converge. Key myths that hinder de-escalation are addressed directly, including the misconception that narrowing equates to undertreatment or requires culture positivity. Instead, we highlight probability-based decision-making founded in site-specific pathogens, local resistance epidemiology, and host risk factors. Practical bedside strategies will be demonstrated, including the use of MRSA nasal PCR to discontinue vancomycin, rapid molecular identification panels to accelerate targeted therapy, selective procalcitonin use to guide duration, and pharmacokinetics/pharmacodynamics (PK/PD) optimization such as extended β-lactam infusions to maintain efficacy while narrowing spectrum. A case-based algorithm will illustrate when to narrow, when to hold, and how to adjust therapy without compromising patient safety. The overarching aim is to equip clinicians with a clear, reproducible mental model for antimicrobial de-escalation that is clinically confident, pharmacologically precise, and stewardship-conscious - preserving today's survival while protecting tomorrow's antimicrobial effectiveness.

Keywords: Antibiotic de-escalation; septic shock; antimicrobial stewardship; infectious diseases; Pharmacokinetic/pharmacodynamic optimization