



Antimicrobial Stewardship Opportunity: Duplicate Anaerobic Coverage

Unnecessary antibiotic use increases the risk for drug toxicities, *Clostridioides difficile* infection, the emergence of drug resistant bacteria, and healthcare costs. One of the most common examples of unnecessary antibiotics is duplicate anaerobic coverage with piperacillin-tazobactam and metronidazole. Read on to learn more about this important antimicrobial stewardship opportunity!

How common is this duplication?

A large study investigated the prevalence of redundant antimicrobial usage in 505 acute care hospitals over a three year period. The authors defined redundant antimicrobial usage as antimicrobial administration of 2 agents that provide coverage for the same organism(s) for at least 2 consecutive days. Three hundred and eighty four (78%) out of 505 acute care hospitals had at least one of the 23 different redundant antimicrobial combinations. The most common redundant antimicrobial combination was piperacillin-tazobactam and metronidazole, which represented 53% of the total sample. Other identified duplicative anaerobic combination included metronidazole in combination with imipenem, meropenem, doripenem, ertapenem, or ampicillin-sulbactam.¹

Is piperacillin-tazobactam and metronidazole combination ever recommended?

Mostly NO! For example, in the 2017 Surgical Infection Society guidelines for the management of intra-abdominal infections only recommend metronidazole in combination with an agent that lacks anaerobic activity on its own. Since piperacillin-tazobactam has excellent anaerobic activity, metronidazole does not need to be added.² Metronidazole can cause neuropathy and central nervous system toxicity.³

The exception would be a patient with an infection requiring piperacillin-tazobactam who has a separate infection that necessitates metronidazole. Examples of this include trichomonas or fulminant *C. difficile* infection where intravenous metronidazole is recommended as part of combination therapy.⁴

What are some ways to address this duplication in therapy?

The Centers for Disease Control and Prevention Core Elements of Antimicrobial Stewardship identify addressing duplicate anaerobic activity as a potential antimicrobial stewardship action.⁵ They suggest pharmacist-based interventions including:

1. Alerting the provider that the antibiotics ordered have overlapping spectra of activity
2. Discussing the clinical case with the provider and recommending discontinuation of metronidazole to avoid duplicative therapy, when appropriate.⁶

Also consider de-escalating piperacillin-tazobactam and continuing metronidazole in cases where anaerobic coverage is needed but anti-pseudomonal activity is not, such as low risk community-acquired intra-abdominal infections or some [diabetic foot infections](#).

Key Takeaway: Piperacillin-tazobactam has reliable activity against anaerobic bacteria and therefore the addition of metronidazole provides no benefit and only potential harm. One key exception is patients with an infection necessitating piperacillin-tazobactam with a secondary infection requiring metronidazole such as fulminant *C. difficile* infection.

References:

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