Kentucky Antimicrobial Stewardship Innovation Consortium

Educational Pearl

Anaerobes in Biliary Tract Infections

Biliary tract infections include acute cholecystitis and acute cholangitis usually associated with obstruction caused by stones or other physiological abnormalities. Antibiotics are indicated in conjunction with a source control procedure for definitive treatment.[1] *E. coli* and *Klebsiella* spp are the most commonly isolated organisms from bile and blood cultures of patients with biliary tract infections and antimicrobial regimens should cover them.[2] Do anaerobes also need to be covered?

What do the guidelines say?

The 2010 Surgical Infection Society (SIS) and Infectious Diseases Society of America (IDSA) guidelines for complicated intra-abdominal infections state for acute cholecystitis and cholangitis anaerobic therapy is not indicated unless a biliary-enteric anastomosis is present.[1] International guidelines are in agreement, citing very low isolation rates for *Bacteroides fragilis*.[2] The 2017 SIS guidelines recommend including coverage of obligate enteric anaerobes for patients with IAIs, but note it may not be essential in patients with upper gastrointestinal sources of infection.[3] The 2024 update to the SIS guidelines does not provide further clarity regarding need for broad anaerobic coverage in biliary tract infections.[4]

What is the evidence?

- There are no randomized trials evaluating the utility of anaerobic coverage in biliary tract infections. Old studies evaluated various regimens without broad anaerobic coverage for biliary tract infections.[5, 6]
- One study of 676 patients prospectively evaluated those with acute cholangitis who empirically received a third-generation cephalosporin or fluoroquinolone (without metronidazole) compared to a historical cohort who did receive metronidazole as part of standard empiric therapy.[7] *Bacteroides* spp. were identified in <1% of patients on blood and bile cultures. No difference in clinical outcomes was identified, including all-cause 30-day mortality.
- A retrospective, propensity score-matched cohort study evaluated 398 patients treated with regimens which did and did not include broad anaerobic coverage for biliary tract infections.[8] Most patients received a cephalosporin with or without ampicillin, with addition or absence of metronidazole depending on the assigned study group. No significant difference was observed in 30-day mortality or 90-day relapse after adjusting for confounders (aOR 1.23, 95% CI 0.69-2.22). No anaerobes were isolated from blood or bile cultures.

Key Takeaway: Routine broad anaerobic coverage may not be necessary in biliary tract infections since anaerobes are infrequently isolated and observational data suggests no difference in clinical outcomes.

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