

Session Summary for July 10, 2018

Didactic: Procalcitonin in Specific Scenarios. Chloe Bryson-Cahn, MD.

* Procalcitonin (PCT), a precursor protein of calcitonin, is secreted into the blood in patients with bacterial infections.
* We discussed specific scenarios where there is data for the use of procalcitonin to drive antibiotic decisions.
* Acute Respiratory Tract Infections
  + Recent meta-analysis1 of 26 randomized controlled trials in 12 countries looking at either initiation or continuation of antibiotics based on PCT levels
    - Outcomes in PCT vs. Non-PCT guided antibiotic use: slight reduction in mortality (10% vs. 9%), reduction in days on antibiotics (2.4 days), and fewer antibiotic adverse events
    - Limitations: 2/26 studies included US hospitals
  + Cochrane review from 20172 demonstrated PCT decreased days on antibiotics without altering mortality nor treatment failure.
  + ProACT Trial3 – RCT in 14 US hospital with strong educational intervention but more "real-world" scenario
    - PCT use did not change total number of antibiotic days nor safety
* Critically Ill/Sepsis
  + Cochrane Review4 – quality of evidence low to moderate, did not show PCT to change outcomes
  + Another recent meta analysis5 showed that PCT decreased days of antibiotics when used to help guide cessation of antibiosis (by 1.3 days) but no overall difference in mortality nor difference when used to help initiate antibiotics.
* UTI/Abdominal Infection/Meningitis
  + There is interest in these topics though the data are not there to support the use
* In Summary:
  + PCT guided antibiotic decision in respiratory tract infection does seem safe
  + Might even improve days of antibiotic use and other patient outcomes
    - But implementation is the key! In the US when implemented without a strong program supporting its use and helping guide clinicians, there were no differences in antibiotic days nor patient safety outcomes.

References:

1. Schuetz P, Wirz Y, Sager R, Christ-Crain M, Stolz D, Tamm M, Bouadma L, Luyt CE, Wolff M, Chastre J, Tubach F. Effect of procalcitonin-guided antibiotic treatment on mortality in acute respiratory infections: a patient level meta-analysis. The Lancet Infectious Diseases. 2018 Jan 1;18(1):95-107.
2. Schuetz P, Wirz Y, Sager R, Christ‐Crain M, Stolz D, Tamm M, Bouadma L, Luyt CE, Wolff M, Chastre J, Tubach F. Procalcitonin to initiate or discontinue antibiotics in acute respiratory tract infections. The Cochrane Library. 2017 Jan 1.
3. Huang DT, Yealy DM, Filbin MR, Brown AM, Chang CC, Doi Y, Donnino MW, Fine J, Fine MJ, Fischer MA, Holst JM. Procalcitonin-Guided Use of Antibiotics for Lower Respiratory Tract Infection. New England Journal of Medicine. 2018 May 20.
4. Andriolo BN, Andriolo RB, Salomao R, Atallah ÁN. Effectiveness and safety of procalcitonin evaluation for reducing mortality in adults with sepsis, severe sepsis or septic shock. The Cochrane Library. 2017 Jan 1.
5. Lam SW, Bauer SR, Fowler R, Duggal A. Systematic Review and Meta-Analysis of Procalcitonin-Guidance Versus Usual Care for Antimicrobial Management in Critically Ill Patients: Focus on Subgroups Based on Antibiotic Initiation, Cessation, or Mixed Strategies. Critical care medicine. 2018 May 1;46(5):684-90.