Poster #2013

Procalcitonin current state evaluation within a large health-system

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BACKGROUND

Procalcitonin (PCT) is a hormone precursor that has been identified as a marker for bacterial infections.[1,2] Procalcitonin increases as the body mounts an inflammatory response against infection, then returns to its normal range once the inflammatory response subsides. Studies have shown that monitoring procalcitonin levels may assist in antibiotic discontinuation.[3,4] Based on these studies, a baseline level should be drawn at the time an infectious diagnosis is considered, as close to the first dose of antibiotics as possible. Follow-up blood levels should be drawn approximately every 48 hours thereafter until levels have normalized. Once levels reach designated threshold values, antibiotic discontinuation should be considered.[5-7] It is important to ensure that a biomarker, such as PCT, is used optimally to provide the greatest benefit to a patient's care as well as to ensure that this test is actionable and value is added.

PURPOSE

The purpose of this study was to determine the current state of PCT monitoring at community hospitals across the United States. The results will be used to identify best practices and opportunities to improve the process of PCT monitoring.

METHODS

This study evaluated PCT monitoring patterns within community hospitals between between August 1, 2016 and July 31, 2017.

Inclusion criteria: Patients 18 years or older, received antibiotics, and were discharged from a facility that had 30 or more PCT levels during the study period

Primary outcome: Number of cases with optimally drawn PCT levels defined as ≥2 levels drawn 24 to 72 hours apart

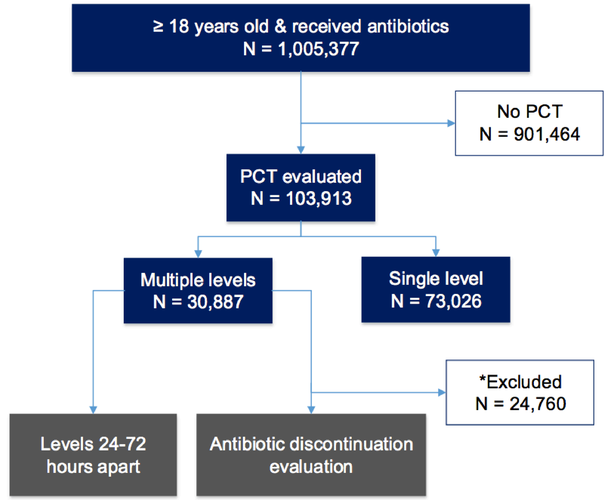
Secondary outcome: Number of cases with all antibiotics discontinued within 36 hours after PCT decreased ≥80% from its peak value or reached a threshold of <0.25 mcg/L or <0.5 mcg/L

- Exclusions:
  - >5 PCT results and levels did not meet one of the thresholds by the fifth level
  - ICD-10 codes for bacteremia, endocarditis, osteomyelitis, encephalitis, or meningitis

Data collected: Patient demographics, lab data, and antibiotic administration records

Data was obtained from a centralized, enterprise data warehouse. All data was de-identified to maintain confidentiality. This study received approval from the University of Tennessee Health Science Center (UTHSC) Institutional Review Board.

STUDY DESIGN



PRIMARY OUTCOME

PCT Levels Evaluated	PCT Group, n (n = 103,913)	%
Single level	73,026	70
Multiple levels	30,887	30
24-72 hours apart	7,089	23
<24 or >72 hours apart	23,799	77

SECONDARY OUTCOME

Criteria	Patients, n	%	Median Duration, days
Antibiotics discontinued at threshold	1,973	32.2	4.7
Antibiotics continued after threshold	4,154	67.7	11

DISCUSSION

Initial PCT levels were drawn within 36 hours of antibiotic initiation approximately 96% of the time, demonstrating that the large majority of baseline levels were checked appropriately. Yet, the average number of PCT drawn per case was 1.6 levels, suggesting that most cases only had a single level drawn and that follow-up levels were not being ordered. Of those with multiple PCT measurements, only 23% had levels consistently drawn 24 to 72 hours apart, as literature would suggest.[5-7] In our analysis, we found that in approximately 32% of cases antibiotics were discontinued after thresholds were met, suggesting that PCT is not being relied upon to support early antibiotic discontinuation. This evaluation may have identified a nationwide opportunity to provide guidance on the appropriate timing of follow-up levels, in addition to a significant opportunity to encourage safe discontinuation of antibiotics when threshold is achieved.

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DISCLOSURES

Kelsey Peña, Mandelin Cooper, Nickie Greer, Ty Elders: Nothing to disclose
Edward Septimus: None at the time of the study. After study completion: Consultant for BioMeriaux
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