Procalcitonin (PCT) is an acute-phase reactant elevated in response to inflammatory stimuli and is relatively specific for bacterial sepsis. Patients in the early phases of bacterial illness may not trigger a high National Early Warning Score (NEWS) at time of presentation to hospital to alert the medical team to potential infection. To our knowledge the role of PCT in this cohort of patients has yet to be evaluated.

Current guidance within our trust is to request a PCT if the clinician is unsure whether bacterial infection is suspected. If low (<0.25 ng/ml) this would not support a clear diagnosis of bacterial infection and suggests to monitor closely instead, with many cases not requiring antibiotics.

Antimicrobial prescribing
- No significant difference in antimicrobial use in initial 48 hours (P<0.005)

Hospital outcomes
- No significant difference in length of stay, requirement for higher level care or 28-day mortality

Antimicrobial stewardship
- High PCT: 100% of antibiotics continued
- Low PCT: 45% had appropriate action taken (including continuing antibiotics if high clinical suspicion of infection/sepsis, CNS,SST or localised infection)

Microbial yield
- No significant difference in positive microbiology yields in high vs low PCT

Correlation with other biochemical markers
- High PCT was associated with a high WCC (p=0.011) and CRP (p<0.005)
- More patients with high PCT developed an acute kidney injury of any stage within the first 72 hours of admission (p=0.007)

Results

Discussion and conclusion
- This was a small-scale piece of work designed to see whether PCT could help differentiate significant infection in patients presenting in the early phases of illness
- Our research supports previous evidence that PCT correlates with other indicators of illness severity
- However, we did not identify significant differences in microbial yield, length of stay, requirement for high level care or 28-day mortality whether admission PCT was high or low
- In patients with a low suspicion of infection, there is a potential for cost-savings in terms of antibiotic prescribing in the presence of a low initial PCT. We would continue however to strongly advocate the use of careful clinical assessment in conjunction with microbiological testing and antibiotic stewardship alongside this approach.

In patients with an ambiguous NEWS at time of hospital presentation:
- How does PCT compare with other biochemical markers associated with infection?
- Were antibiotics stopped or withheld appropriately if PCT was low, or started/continued if high?
- Was a likely causative organism (either isolated in culture or positive serology) was found in patients with a high or low PCT?
- Was a high PCT at admission associated with a difference in hospital outcomes?
- Was the early use of PCT cost-effective in terms of antimicrobial prescribing?

Questions

Method
- Prospective analysis of 100 adult medical patients presenting to Royal Hampshire County Hospital with a NEWS of 3 or 4 (i.e. neither high nor low) between December-March 2017
- Measurement of baseline PCT within 24 hours of admission
- Supplementary data collected on additional biochemistry, diagnosis, antibiotics prescribed, positive microbiology returned, length of stay, ITU/HDU admission, and 28-day outcome.

Introduction

Procalcitonin (PCT) is a sensitive marker of bacterial infection that can be used to guide antimicrobial prescribing. However, the role of PCT in the early phases of bacterial illness is not well understood. The aim of this study was to investigate the use of PCT in patients with an ambiguous NEWS and to determine if PCT could help differentiate significant infection in patients presenting in the early phases of illness.

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References