

THE USE OF SERUM PROCALCITONIN TESTING IN HOSPITAL INPATIENTS OVER THE AGE OF 80 YEARS OLD.

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Introduction

Procalcitonin (PCT) is a precursor to the hormone calcitonin and is produced by the CALC-1 gene which is expressed in thyroid and neuroendocrine cells. In response to bacterial infection or cytokine production, the CALC-1 gene is expressed in all tissues. This increases the PCT levels in response to infection^{1,2}.

Therefore, PCT is a useful tool to aid in the clinical diagnosis of a bacterial infection or sepsis. It is detectable 3-4 hours after infection and reaches a peak level at 6-12 hours³. PCT subsequently decreases when the infection resolves, which makes it an effective marker to track treatment efficacy.

There are numerous other factors which can increase PCT levels, including major surgery, severe trauma, burns, prolonged cardiogenic shock, malaria, fungal infections, and paraneoplastic syndromes^{4,5}.

This study aimed to identify how PCT testing was utilised in a district general hospital in older adults.

Methods

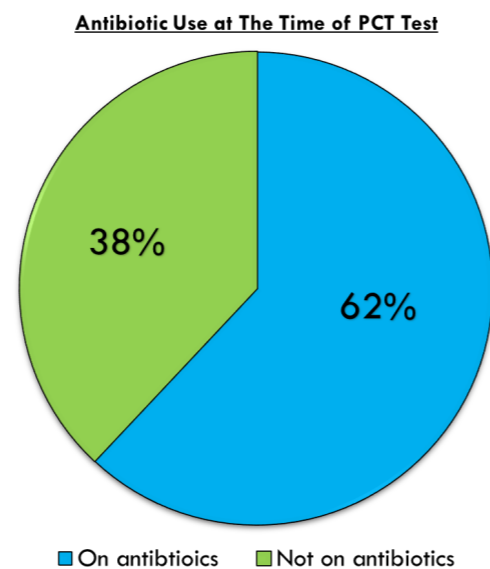
This was a retrospective study with the following inclusion criteria:

1. Hospital inpatients on medical wards over the age of 80 years old
2. A PCT test was performed between November 2022 and April 2023

Electronic patient records were accessed and data was manually collated. The results were then interpreted using Microsoft Excel.

Results

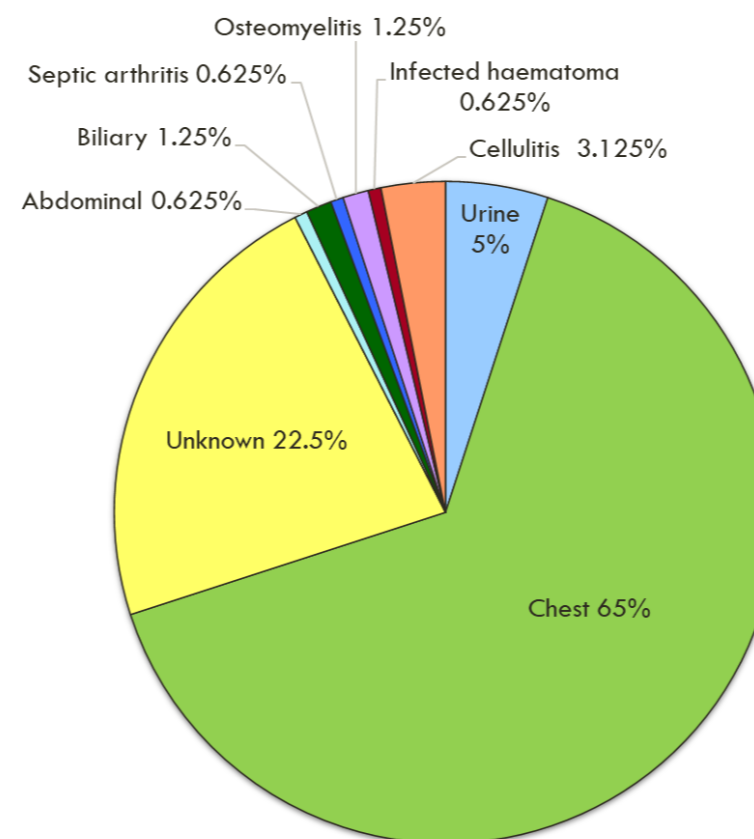
A total of 160 patients' data was collected with a median age of 85 years and a median clinical frailty score of 6.



Of the 160 patients, 62% were on antibiotic therapy when a PCT test was taken.

47.5% of patients with a PCT test had a viral respiratory tract infection at the time of testing.

Suspected Source of Infection



The most common suspected source of infection was chest with 65%. Other notable results included "unknown" at 22% and urine at 5%.

Most notably only 2.5% of patients had two or more serial PCTS taken 24-48 hours apart.

Limitations

1. Small patient population
2. Human factors: interpretation of electronic patient records and reasoning behind the PCT tests being performed

Conclusion

Only a minority of patients (2.5%) had more than one PCT result taken indicating that the clinical utility of this blood test to aid decision making in altering antimicrobial therapy was not occurring. Therefore, PCT testing within an older adult population is being used in an inappropriate manner in the context of infection. Given a cost of £39.50 per test we anticipate that in its current use PCT is not being used in a cost-effective or clinically effective manner.

Thoughts for the future

Teaching for medical professionals and the wider MDT around the basis for PCT testing and how results can be interpreted effectively to aid decision making in altering antimicrobial therapy may be beneficial.

There should be consideration around increasing the regulation of PCT testing due to cost and that currently it is not being used in a clinically effective manner.

References

1. In Critically Ill Patients, Serum Procalcitonin Is More Useful in Differentiating between Sepsis and SIRS than CRP, IL-6, or LBP - PMC (nih.gov)
2. View of Procalcitonin and other biomarkers to improve assessment and antibiotic stewardship in infections - hope for hype? (smw.ch)
3. Clinical Utility and Measurement of Procalcitonin - PMC (nih.gov)
4. Serum procalcitonin concentrations in acute malaria | Transactions of The Royal Society of Tropical Medicine and Hygiene | Oxford Academic (oup.com)
5. Calcitonin heterogeneity in lung cancer and medullary thyroid cancer - PubMed (nih.gov)