Use of Procalcitonin in critical care unit as a guide to antibiotics use in COVID -19 patients.

Dr Ikenga Chidiebele, Dr Avinash Jha. Department of Intensive Care Unit, Royal Preston Hospital, Lancashire Teaching Hospitals Foundation Trust, Lancashire. United Kingdom.

INTRODUCTION

•At the start of the pandemic first wave in March 2020, it was observed the usual markers of infection like the White blood cells (WBC) and Creactive proteins(CRP) were also much elevated in patients in Covid -19 patients too.

• This made it difficult to differentiate

METHODS

•Retrospective study.

•Reviewed data of Covid-19 patients admitted in ICU from 3rd march to 1st June, 2020.

•Initially at the start of Covid-19, PCT test was not readily available and its use restricted to ICU and emergency department.

•Data from 53 patients were used in this study.

•They were categorized into PCT and non PCT groups with 25 patients belonging to the PCT group.

• A total of 106 PCT tests done on the 25 patients. 15 patients from the PCT group continued antibiotics till either discharge from ICU or death.

•Patients from the non PCT group continued antibiotics until discharge from unit or death.



•The Audit achieved all its set objectives

•There was good compliance with trust antibiotics guidelines and PCT use..

•Observed Correlation between measured inflammatory markers and PCT.

•Significant relationship between reduced duration of antibiotics and PCT use

the viral response from bacterial coinfection which were often present in patients.

 It meant that at the initial couple of months, the patients admitted in hospital with covid 19, were often placed on antibiotics for a long time. • This led to our center in those early stages commencing on use of Procalcitonin(PCT) as a possible guide for antibiotics use. Procalcitonin (PCT) is a biomarker used to predict likelihood of bacteria infection. It is a 114 amino acid peptide

precursor of calcitonin hormone. •In absence of infection, Gene expression down regulated and restricted to neuroendocrine glands... This lead to regulated Peptide secretion and no increase in procalcitonin. •The reverse occurs In presence of

bacterial infection where gene

• PCT became very available for more widespread use in ICU and hospital.

•The study population were grouped into 2 groups of patients

- Those that did not have PCT done(this were patients during the start of the pandemic when PCT tests were not readily available)

-The group that had PCT tests done during their stay in the critical care unit.

•Study done between 6th June and 15th Aug,2020.

•Medical records obtained from the hospital's medical online system Quadramed and allied records

•Data collection with Excel

•Statistical analysis with STAT Direct

•There were positive correlation between PCT and Inflammatory markers in the PCT group.

•There was a correlation between rise in PCT and positive culture after septic screens.

•There is a significant difference in duration of antibiotics use in both groups with calculated p value of 0.0085.

•There was no significant difference in mortality across both groups.

•In the PCT group, 92% of patients hospital guidelines on the use of PCT and de-escalation of antibiotics were followed.



•Small number of patients.

•A single center study which might limit the application of recommendations.

 An evolving disease with evolving management protocols.

•This was a snap shot of event in the first wave and likely to be different now with more widespread use of the procalcitonin test.



•The Procalcitonin test guidelines can be reviewed to give a clear suggestion on how frequent PCT can be done.

expression is unregulated.

OBJECTIVES

•Evaluate the use of Procalcitonin (PCT) as a guide of antibiotics use.

•Evaluate the correlation between procalcitonin and other inflammatory markers.

•Evaluate the use of PCT trend in determining the continuation and deescalation of antibiotics and relationship to outcome.

•To evaluate if the trust guidelines on PCT use is being followed.

		Continue antibiotics for the recommended course as per guidelines		pathology, such as vi pneumonia	ral
scalating antibiotic Consider stopping i already started	s. Start/escalate f antibiotics if still clinically indicated			Consider stopping antibiotics, as PCT m be due to another	ay
₩ Hold off starting	⊐↓		4		swab
< 0.25 ng/mL	≥ 0.25 ng/mL	Downward trend	Upward trend	Static	(immunosuppressed):
•	, , , , , , , , , , , , , , , , , , ,	↓	•		throat swab/ sputum/BAL • PCP PCR
Repeat PCT after 24h					Immunosuppressed: • Mycoplasma PCR: nose :
					 Preumococcal antigen CXR Additional tests for patients on Critical Care/
V Don't start or escalate antibiotics		Start/escalate antibiotics		v ibiotics	
↓ < 0.25 ng/mL		≥ 0.25 ng/mL			productive •! trine for legionalla /
				k	throat swab/ sputurn/ BAI •Souturn for MC&S if
		Initial PCT		Î	 diagnostics: COVID screen: nose &
		•		5,8	Send appropriate
antibiotics base	d on clinical findings, eith	her on admission o	r at any subse	\Rightarrow	t neutropenic, tollow trust neutropenic sepsis guideline



 Cost benefit evaluation of developing a protocol encouraging PCTs at particular points/stages in patient management in the unit...

•More widespreaad use of PCT test in the hospital to help reduce duration of antibiotics on patients with covid that are not in ICU.

POST AUDIT

•Pro calcitonin test is now available for use in all parts of the hospital.

•The guideline has been updated to accommodate how frequent and who can order a pro calcitonin test in the hospital.



Christ-Crain M, Müller B. Procalcitonin in bacterial infections--hype, hope, more or less? Swiss Med Wkly. 2005 Aug 6;135(31-32):451-60PDF. Assessed on 30th,



correlating with overall clinical progress and consider discussion with the Consultant Microbiologist

PCT VS CRP AND WBC

radiological results

Procalatonin (PCI) is regarded as a biomarker specific for bacterial infections and can be used to rationalise antibiotic therapy and determine course

duration. Antibiotic decisions should be based on a combination of the clinical picture, blood results including PCT trend and available microbiological /

As with any clinical test this is a guide to treatment and does not replace clinical judgement. PCT should not be interpreted in isolation and we advise



PCT

No PCT







august 2020.

Mitsuma SF, Mansour MK, Dekker JP, et al. Promising new assays and technologies for the diagnosis and management of infectious diseases. Clin Infect Dis. 2013 Apr;56(7):996-1002full-text. Assessed on 20th August, 2020.

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