Abstract P90 Figure 1 The association of PCT in COVID-19 and patient morbidity and mortality.

Hospital between 1st November 2020 and 28th February 2021. Mortality encompassed both inpatient and within 28 days post-discharge. Significant morbidity was defined as admission to the Intensive Care Unit (ICU) for organ support. PCT was measured using Brahms' chemiluminescent micro particle assay (CMIA). Elevated PCT was defined at two levels: PCT $\geq 0.5\mu\text{g/L}$ and PCT $\geq 0.2\mu\text{g/L}$, to account for variance amongst literature.² Regression analysis was performed to determine independent significance, accounting for comorbidity and demographics.

Results We found elevated PCT levels conferred a significant two-fold increase in mortality and ICU admission. Initial PCT $\geq 0.5\mu\text{g/L}$ was associated with a significantly increased risk of mortality than those with PCT $< 0.5\mu\text{g/L}$ (46.5% vs 24.2%; OR 2.847, $p=0.0001$). Significantly higher mortality risk was also observed when using lower cut-off values, i.e. PCT $\geq 0.2\mu\text{g/L}$ vs PCT $< 0.2\mu\text{g/L}$ (OR 2.042, $p=0.00001$). A significantly higher rate of ICU admission for initial PCT $\geq 0.5\mu\text{g/L}$ (OR 2.041, $p=0.007$) or PCT $\geq 0.2\mu\text{g/L}$ (OR 1.918, $p=0.0008$) was also observed within our cohort.

Conclusions Here, we report the largest single-centre study to date in analysing a UK-based population for procalcitonin in COVID-19. We observed a significant correlation between elevated initial levels of PCT and incidence of ICU admission and mortality within our cohort, thereby demonstrating promise for PCT as an effective prognostic marker. Using a higher cut-off for PCT $\geq 0.5\mu\text{g/L}$ increased mortality by almost 50%, but had no effect on morbidity. We suggest that a lower universal cut-off point for PCT should be used for detecting secondary bacterial infections and procalcitonin-guided antimicrobial therapy.

REFERENCES

- Hu R, et al. *International Journal of Antimicrobial Agents* 2020;**56**(2):106051.
- Vazzana N, et al. *Acta Clin Belg.* 2020 Sep **23**:1–5.

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IMPACT OF BACTERIAL INFECTIONS IN PATIENTS WITH COVID-19 ON MORBIDITY AND MORTALITY DURING THE SECOND UK SARS-COV-2 WAVE

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Background Bacterial infection has previously been observed in only 8% of COVID-19 patients,¹ yet antibiotics are administered to 85% of inpatients. Typically, Gram negative organisms and *Staphylococcus aureus* are isolated as responsible pathogens.² Here, we investigate the rates of bacterial infection during the second UK COVID-19 wave, its sources, the responsible organisms, and its impact on morbidity and mortality.

Methods 1342 RT-PCR positive COVID-19 patients admitted to a Greater London District General Hospital between 1st November 2020 and 28th February 2021 were retrospectively analysed (44.6% female; mean age 68.8; mortality 26.9%). Mortality encompassed hospitalised patients and those up to 28 days post-discharge. Morbidity was assessed by length-of-stay and need for intensive care. Positive cultures due to contaminants were excluded. Independent correlation was assessed with multilinear regression analysis adjusting for demographics and comorbidities.

Results 226 patients (16.8%) with COVID-19 had ≥ 1 bacterial infection. These patients possessed significantly higher independent mortality (35.0% vs. 25.3%, $p<0.009$), more frequently required intensive care support (19.5% vs 10.6%, $p<0.00004$), and required longer inpatient spells (19.6 days vs 9.46 days, $p<0.0001$). Greater number of positive culture types cumulatively increased mean length-of-stay (OR 9.08, $p<0.00001$); ≥ 2 culture type positivity ($n=44$) related to 31.5 days; ≥ 3 culture type positivity ($n=12$) 46.0 days. There was significantly higher mortality rate in patients receiving ≥ 1 antibiotic (30.2%) compared to no antibiotics (6.4%, $p<0.00001$).

Conclusion Bacterial infection is observed far more frequently in COVID-19 patients than previously reported and adversely affects morbidity and mortality. Multiple sites of bacterial infection prolongs inpatient stay and increases mortality. Thorough culture collection should be encouraged in COVID-19 patients with biochemical evidence of bacterial infection to identify responsible pathogens and respective antimicrobial sensitivity. Given the higher mortality rates, empirical use of antibiotics in COVID-19 patients without supporting evidence of bacterial infection is strongly discouraged.

REFERENCES

- Lansbury, et al. *J Infect.* 2020 Aug;**81**(2):266–2.
- Russell C, et al. *Lancet Microbe.* 2021 Jun 2. [https://doi.org/10.1016/S2666-5247\(21\)00090-2](https://doi.org/10.1016/S2666-5247(21)00090-2)

Abstract P91 Table 1 (a) Most frequently observed bacterial species (b) Culture type positivity with relation to rates of mortality

(a)	Number	(b)	Number of	Number of	Positivity
Bacteria	isolated	Culture Type	positives	deaths	mortality
<i>Enterococcus</i>	67	Urine	104	28	26.9%
<i>Escherichia</i>	65	Blood	76	28	36.8%
<i>Staphylococcus</i>	64	Skin	40	16	40%
<i>Pseudomonas</i>	24	Sputum & BAL	33	20	60.6%
<i>Klebsiella</i>	12	Stool	13	5	38.5%
<i>Streptococcus</i>	12	Central venous line	8	4	50%