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Procalcitonin Levels in COVID-19 Patients are Strongly Associated with Mortality and ICU Acceptance in an Underserved, Inner City Population

Rationale: The novel severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2), which causes COVID-19, has led to a global health crisis unlike any our contemporaries have witnessed before. This retrospective, single-center observational study grants a unique perspective surrounding the experience of the critical care service at a public institution serving a predominantly Afro-Caribbean, inner city population.

Methods: Between March 11 and April 30, 2020, the critical care service was consulted for a total of 271 COVID-19 patients. We queried the electronic medical record for patient visits with critical care consult notes and collected data on demographics, comorbidities, ICU acceptance, treatment strategies, and clinical outcomes. Statistical analyses were performed to identify factors associated with mortality and ICU admission status.

Results: Of the 271 patients with critical care consults, 33% survived and 67% expired. At the bivariate level, age, BUN, and neutrophil percentage were significantly associated with mortality. The univariate logistic regression model revealed a significant association between neutrophil percentage and mortality. In the multivariate analyses after adjusting for age, sex, and race/ethnicity, elevated procalcitonin, elevated CRP, and decreased platelets were significantly associated with increased odds of mortality (for procalcitonin: Q4 vs Q1, OR 5.65, 95% CI (2.14-14.9), p trend <0.001). Of these factors, only elevated procalcitonin was also associated with a higher likelihood of ICU acceptance.

Conclusions: This retrospective, observational study identified key factors linked to disease severity and outcomes. Procalcitonin was the factor most strongly associated with both mortality and the likelihood of ICU acceptance at the bivariate level. Our findings suggest that procalcitonin is an important biomarker for the intensivist to consider when assessing a COVID patient as it may have a role in prognosticating disease severity.

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