Category :**Sepsis: biomarkers**

A250 - *culture positivity is a strong prognostic indicator of in-hospital mortality for covid-19 patients with sepsis*

MJP Patton [1] ; AG Gagger [2] ; NE Erdmann [3] ; CH Orihuela [4] ; KH Harrod [5] ; MM Might [1]

[1]*University of Alabama at Birmingham, Hugh Kaul Precision Medicine Institute, Birmingham, United States,* [2]*University of Alabama at Birmingham, Department of Medicine, Division of Pulmonary, Allergy and Critical Care and Program in Protease and Matrix Biology, Birmingham, United States,* [3]*University of Alabama at Birmingham, Department of Medicine, Division of Infectious Diseases, Birmingham, United States,* [4]*University of Alabama at Birmingham, Microbiology, Birmingham, United States,* [5]*University of Alabama at Birmingham, Department of Anesthesiology and Perioperative Medicine, Birmingham, United States*

Introduction:
Despite numerous clinical scoring systems, outcome modeling for COVID-19 patients with sepsis remains poor. To address this deficit, we assessed the impact of culture positivity on in-hospital mortality for COVID-19 patients with sepsis. We report that culture positive sepsis derived from blood, bronchoalveolar lavage (BAL), or cerebrospinal fluid (CSF) is a stronger prognostic indicator of in-hospital mortality for COVID-19 patients than the Sequential Organ Failure Score (SOFA). These results support inclusion of culture status in future clinical scoring systems.

Methods:
The cohort was defined by inpatients from 03/20-09/21 with a COVID-19+ test (PCR, rapid-antigen, antibody) and septic event (n=792) as defined by Sepsis-3 guidelines (1). Each patient's worst SOFA score was computed during their suspected infection window (defined as 24 hours prior to and 48 hours after the first antibiotic administration or body-fluid culture taken). Study groups included culture positive (n=478) and culture negative (n=314) sepsis patients. Charlson comorbidity scores for each patient were calculated prior admission. Positive predictors of in-hospital mortality were assessed with multivariate logistic regression and evaluated for statistical significance using the CAR-ANOVA Type-III test with Bonferroni method.

Results:
Multivariate logistic regression analysis showed that culture positivity had the greatest adjusted odds ratio (OR: 3.19, 95% CI: 2.09-4.98, $p<0.001$, corr. $p<0.001$), compared to worst SOFA score (OR: 1.91, 95% CI: 1.61-2.27, $p<0.001$, corr. $p<0.001$), patient age (OR: 1.46, 95% CI: 1.20-1.80, $p<0.001$, corr. $p<0.001$), male sex (OR: 1.67, 95% CI: 1.15-2.42, $p<0.006$, corr. p=NS) and comorbidity score (OR: 1.02, 95% CI: 0.84-1.22, p=NS, corr. p=NS).

Conclusion:
Culture positivity is a strong prognostic indicator of in-hospital mortality for COVID-19 sepsis patients and warrants investigation as a candidate variable for future clinical outcome algorithms.

References:
1. Singer et al. DOI:10.1001/jama.2016.0287

Image :

Logistic Regression Model for In-Hospital Mortality in COVID-19+ Sepsis Patients (n=792)				
Outcome	Model Variable	Adjusted OR [95% CI]	P-value	Corr. P-value
In-Hospital Mortality (181/792)	Age	1.46 [1.20-1.80]	<0.001	**<0.001**
	Charlson Comorbidity Score	1.02 [0.84-1.22]	0.860	>0.05
	Worst SOFA Score	1.91 [1.61-2.27]	<0.001	**<0.001**
	Positive Culture	3.19 [2.09-4.98]	<0.001	**<0.001**
	Sex (Male)	1.67 [1.15-2.42]	0.006	**0.032**
OR = Adjusted Odds Ratio, CI = Confidence Interval, P-value = CAR ANOVA-III test, Corr. P-value = Bonferroni correction for multiple testing.				

Multivariate Logistic Regression Reveals Culture Positivity as Strongest Indicator of In-hospital Mortality for COVID-19 Patients with Sepsis