

307. Predictors of Respiratory Bacterial Co-Infection in Hospitalized COVID-19 Patients

Erica E. Reed, PharmD, BCPS-AQ ID¹; Austin Bolker, PharmD, MBA¹; Kelci E. Coe, MPH²; Jessica M. Smith, PharmD, MBA, BCIDP¹; Kurt Stevenson, MD, MPH³; Shu-Hua Wang, MD, PharmD¹; ¹The Ohio State University Wexner Medical Center, Columbus, OH; ²Ohio State University Wexner Medical Center, Columbus, OH; ³The Ohio State University College of Medicine and College of Public Health, Columbus, Ohio

Session: P-14. COVID-19 Complications, Co-infections, and Clinical Outcomes

Background. COVID-19 pneumonia can be indistinguishable from other infectious respiratory etiologies, so providers are challenged with deciding whether empiric antibiotics should be prescribed to hospitalized patients with SARS-CoV-2. This study aimed to evaluate predictors of respiratory bacterial co-infections (RBCI) in hospitalized patients with COVID-19.

Methods. Retrospective study evaluating COVID-19 inpatients from Feb 1, 2020 to Sept 30, 2020 at a tertiary academic medical center. Patients with RBCI were matched with three COVID-19 inpatients lacking RBCI admitted within 7 days of each other. The primary objectives of this study were to determine the prevalence of and identify variables associated with RBCI in COVID-19 inpatients. Secondary outcomes included length of stay and mortality. Data collected included demographics; inflammatory markers; bacterial culture/antigen results; antibiotic exposure; and COVID-19 severity. Wilcoxon rank sum, Chi Square tests, or Fisher's exact tests were utilized as appropriate. A multivariable logistic regression (MLR) model was conducted to identify covariates associated with RBCI.

Results. Seven hundred thirty-five patients were hospitalized with COVID-19 during the study period. Of these, 82 (11.2%) had RBCI. Fifty-seven of these patients met inclusion criteria and were matched to three patients lacking RBCI (N = 228 patients). Patients with RBCI were more likely to receive antibiotics [57 (100%) vs. 130 (76%), p < 0.0001] and for a longer cumulative duration [19 (13-33) vs. 8 (4-13) days, p < 0.0001] compared to patients lacking RBCI. The MLR model revealed risk factors of RBCI to be admission from SNF/LTAC/NH (AOR 6.8, 95% CI 2.6-18.2), severe COVID-19 (AOR 3.03, 95% CI 0.78-11.9), and leukocytosis (AOR 3.03, 95% CI 0.99-1.16).

Conclusion. Although RBCI is rare in COVID-19 inpatients, antibiotic use is common. COVID-19 inpatients may be more likely to have RBCI if they are admitted from a SNF/LTAC/NH, have severe COVID-19, or present with leukocytosis. Early and prompt recognition of RBCI predictors in COVID-19 inpatients may facilitate timely antimicrobial therapy while improving antimicrobial stewardship among patients at low risk for co-infection.

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308. Secondary Infections in Patients Requiring Extracorporeal Membrane Oxygenation (ECMO) for Severe Acute Respiratory Distress Syndrome (ARDS) due to COVID-19 Pneumonia (PNA)

Ryan Rivosecchi, PharmD, BCCCP¹; J. Alex Viehman, MD²; Christina K. Thorngren, MD, MPH¹; Ryan K. Shields, PharmD, MS²; Fernanda P. Silveira, MD, MS, FIDSA²; Fernanda P. Silveira, MD, MS, FIDSA²; Eun Jeong Kwak, MD²; Peter Volpe, MD³; Vidya Jagadeesan, MD⁴; Cornelius J. Clancy, MD³; Minh Hong Nguyen, MD¹; Palash Samanta, MD²; ¹UPMC Presbyterian Hospital, Pittsburgh, PA; ²University of Pittsburgh, Pittsburgh, Pennsylvania; ³University of Pittsburgh Medical Center, Pittsburgh, PA; ⁴UPMC, Pittsburgh, Pennsylvania

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Background. Rescue ECMO has been used worldwide in patients (pts) with ARDS caused by COVID-19. Bacterial super-infections affect 3.5-14.3% of hospitalized pts with COVID-19. Pts requiring ECMO may be at an increased risk of infection due to their severity of illness, gut translocation and ECMO impact on host immunity.

Methods. This was a retrospective review of pts requiring ECMO for COVID-19 from April 2020-2021 at a single center. Strict definitions of infections (including ventilator-associated PNA, VAP) were in accordance with CDC criteria.

Results. 43 ECMO pts with 1065 ECMO days were evaluated. Median age was 53 yrs (range: 21-62) and median BMI was 36.2 (range: 19.4-75.8). 70% were men and 65% were white. 37 patients (86%) experienced a total of 40 infectious episodes with a median onset from ECMO cannulation to first infection of 10.5d (range: 4-50). Median SOFA and SAPSII scores at time of infection were 12 (6-20) and 63 (30-90), respectively. PNA was the most common infection (78%, with 19% of cases complicated by bacteremia and 3% by empyema) (Fig. 1). The most common organisms isolated were Enterobacteriales (37%), *S. aureus* (25%) and *P. aeruginosa* (16%) (Fig. 2). Only 2% of all organisms were multi-drug resistant. 3 pts had fungal infections (1 candidemia, 2 aspergillus PNA). Duration of ECMO was significantly longer for infected pts (26d, range: 5-92d) vs (11d, range: 3-24d), p=.01. 95% of infected pts had received steroids vs. 67% of uninfected pts, p=0.09. Treatment success at 1 week was 50%, and 24% and 40% of pts had recurrent infections and persistent/recurrent organisms in clinical

cultures, respectively. *S. aureus* (54%) and Enterobacteriales (26%) were associated with persistent or recurrent clinical cultures, requiring prolonged antimicrobial therapy. Mortality rate at 30 days was 65% and was significantly higher for pts with infection than those without (67% vs 33%, p=.02).

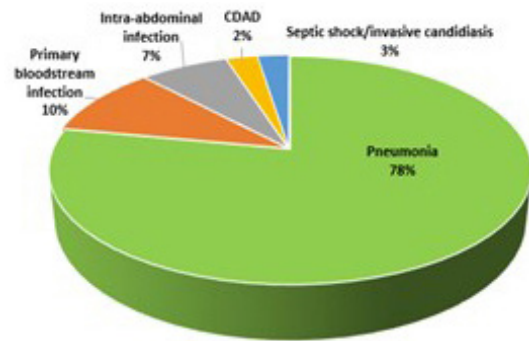


Fig.1 Types of infections among COVID-19 patients on ECMO

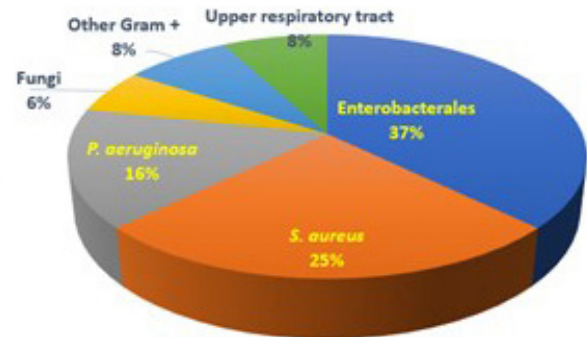


Fig. 2. Organisms causing infection

Conclusion. Super-infection (most commonly PNA) occurred in almost all COVID-19 pts requiring ECMO for >4 days, and was a significant risk factor for death. Recurrent infections among survivors were common, especially when caused by Enterobacteriales or *S. aureus*. Super-infection and mortality rates of ARDS pts on ECMO for COVID-19 were worse than for ARDS pts on ECMO for influenza at our center.

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309. TB Quantiferon Testing Predicts Mortality in Patients with COVID-19

Mirza Z. Baig, MD¹; Siyun Liao, PharmD, PhD, BCPS, BCIDP²; Margaret Powers-Fletcher, PhD¹; Moises A. Huaman, MD, MSC¹; Senu Apewokin, MD¹; ¹University of Cincinnati, Mason, Ohio; ²UC Health-University of Cincinnati Medical Center, Cincinnati, OH

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Background. Finding reliable clinical predictors for severity of COVID-19 has been challenging. Interferon gamma (IFNG) plays an important role in viral replication. QuantiFERON-TB (QFT) test relies on IFNG release in response to antigens. A positive or negative test signifies adequate IFNG response, whereas an indeterminate result is obtained when such a response is lacking. In this study, we have attempted to see if an indeterminate QFT result can provide prognostic information on patients with COVID-19.

Survival Probability in patients with Covid - 19 and an indeterminate TB Quantiferon test result