Relevant patient characteristics and laboratory parameters in patients hospitalized with COVID-19 and fungemia

Conclusion. Fungemia in hospitalized patients with COVID-19 is associated with higher mortality. We observed higher fatality in non-C. albicans infections. Prolonged use of central line catheters and concurrent treatment with steroids/tociluzimab are likely high-risk factors for development of fungemia.

Disclosures. All Authors: No reported disclosures

349. Diagnostic Testing and Antibiotic Utilization in Patients with COVID-19
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Session: P-14. COVID-19 Complications, Co-infections, and Clinical Outcomes

Background. Patients with COVID-19 receive high rates of antibiotic therapy, despite viral origin of infection. Reports of bacterial co-infection range from 3.5 to 8% in the early phase of infection. This study aimed to evaluate the relationship between diagnostic tests and antibiotic utilization in patients admitted with COVID-19 at the University of Maryland Medical Center to better inform future prescribing practices.

Methods. Retrospective cohort study of adult patients with a positive SARS-CoV-2 PCR on admission from March 2020 through June 2020. Associations between diagnostic tests employed and antibiotic initiation and duration were explored using bivariate analysis (SPSS®).

Results. Baseline characteristics of 224 included patients are reported in Table 1. Excluding SARS-CoV-2 PCRs, most frequently performed diagnostic tests included blood cultures (65.6%), MRSA nasal surveillance (45.1%), respiratory cultures (36.2%), respiratory viral panel (RVP) (33.0%), and Legionella (28.6%) and pneumococcal (26.3%) urine antigens. Positivity of RVP, Legionella, pneumococcus, blood, and respiratory tests were low (1.3%, 0.4%, 0.9%, 1.8%, and 6.7%, respectively). A total of 62% of patients were initiated on antibacterial therapy with a median cumulative antibiotic duration of 77.9 hours (IQR: 41.4, 111.8). History of chronic respiratory disease (76% vs. 58.6%; P=0.025), any degree of oxygen requirement on admission (72% vs. 42.6%; P=0.006), and performance of blood cultures (70.7% vs. 46.8%; P=0.001) were associated with antibiotic initiation. Positive bacterial diagnostic respiratory culture (median duration 72.8h [IQR: 46.7, 96.6] vs. 97.5h [IQR 79.8, 194.1]; P=0.027) and positive blood culture (median duration 80.1h [IQR 42.1, 111.7] vs. 97.5h [IQR 71.8, 164.8]; P=0.046) were associated with longer antibiotic duration. Patients who did not have respiratory cultures performed had similar antibiotic durations as those with negative respiratory cultures.

Table 1. Baseline Characteristics

| Age; mean (SD), years | 54 (17.3) |
| Male; n (%) | 142 (63.4) |
| Race; n (%) |  |
| Black or African American | 126 (56.3) |
| Hispanic or Latino | 51 (22.8) |
| White | 28 (12.5) |
| Asian | 6 (2.7) |
| American Indian or Alaska Native | 2 (0.9) |
| Comorbidities; n (%) |  |
| Body mass index > 30 kg/m² | 136 (60.7) |
| Chronic cardiac disease | 12 (54.0) |
| Diabetes mellitus | 74 (33.0) |
| Chronic respiratory disease | 50 (22.3) |
| Chronic kidney disease | 29 (12.9) |
| Level of care on admission; n (%) |  |
| Floor | 94 (42.0) |
| ICU | 90 (40.2) |
| IMC | 40 (17.9) |
| Oxygenation status on admission; n (%) |  |
| Invasive mechanical ventilation/ECMO | 89 (39.7) |
| Room air | 54 (24.1) |
| Low-flow nasal canula | 50 (22.3) |
| Non-invasive ventilation or high-flow nasal canula | 31 (13.8) |

Conclusion. Despite low coinfection rates, negative diagnostic tests did not result in shorter empiric antibacterial duration. These findings highlight the ongoing need for both diagnostic and antimicrobial stewardship in COVID-19.

Disclosures. Emily Heil, PharmD, MS, BCIDP. Nothing to disclose Kimberly C. Claeyss, PharmD. GenMark (speaker’s bureau)

350. Joint Modeling of EHR and CXR Data to Predict COVID-19 Deterioration
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Session: P-14. COVID-19 Complications, Co-infections, and Clinical Outcomes

Background. Infectious respiratory-track pathogens are a common trigger of healthcare capacity strain, e.g. the COVID19 pandemic. Patient risk stratification models to identify low-risk patients can help improve patient care processes and allocate limited resources. Many existing deterioration indices are based entirely on structured data from the Electronic Health Record (EHR) and ignore important information from other data sources. However, chest radiographs have been demonstrated to be helpful in predicting the progress of respiratory diseases. We developed a joint EHR and chest x-ray (CXR) model and applied it to identify low-risk COVID19+ patients within the first 48 hours of hospital admission.

Methods. All COVID19+ patients admitted to a large urban hospital between March 2020 and February 2021 were included. We trained an image model using large public chest radiograph datasets and fine-tuned this model to predict acute dyspnea using a cohort from the same hospital. We then combined this image model with two existing EHR deterioration indices to predict the risk of a COVID19+ patient being intubated, receiving a nasal cannula, or being treated with a vasopressor. We evaluated models’ ability to identify low-risk patients by using the positive predictive value (PPV).

Results. The image-augmented deterioration index was able to identify 12% of 716 COVID19+ patients at low risk with 0.95 positive predictive value in the first 48 hours of admission. In contrast, when used individually, the EHR and CXR models each identified roughly 3% of the patients with a PPV of 0.95.

Predicting Low Risk Patients

Figure 1. Aggregated predictions for COVID19 positive patients within the first 48 hours of admission, shown with exponential weight moving average and 95% CIs. Each plot shows the number of patients flagged as low-risk by lowest aggregated prediction and the resulting accuracy for that fraction of patients. The top plot compares the MUCRES fused model to the MUCRES model. The bottom plot compares the EDI fused model to the EDI model.

Aggregated predictions for COVID19 positive patients within the first 48 hours of admission, shown with exponential weight moving average and 95% CIs. Each plot shows the number of patients flagged as low-risk by lowest aggregated prediction and the resulting accuracy for that fraction of patients. The bottom plot compares the MUCRES fused model to the MUCRES model. The top plot compares the EDI fused model to the EDI model.

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