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374. Complication with Bacterial Pneumonia in Hospitalized Patients with Coronavirus Disease 2019 (COVID-19)

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| Culture Source | SARS-CoV-2 Positive | SARS-CoV-2 Negative | Total |
|---|---------------------|---------------------|-----------------|
| All Admissions | 17,075 | 124,979 | 142,054 |
| No Cultures Collected | 369 (2.2%) | 10,080 (8.1%) | 10,449 (7.4%) |
| Total Cultures Collected | 16,706 (97.2%) | 114,899 (91.9%) | 131,605 (92.4%) |
| Culture Positive for bacteria, fungi or non-COVID virus | 3,487 (20.9%) | 24,539 (21.4%) | 28,026 (21.3%) |
| Overall LOS (mean (SD); median days) | 8.7 ± 12.9 (6) | 5.1 ± 9.0 (3) | 5.5 ± 9.6 (3) |
| Hospital LOS among culture positive for co-pathogens (mean (SD); median days) | 13.8 ± 16.1 (9) | 8.3 ± 11.8 (5) | 9.0 ± 12.6 (6) |
| Hospital LOS among culture negative for co-pathogens (mean (SD); median days) | 7.5 ± 11.7 (5) | 4.6 ± 8.4 (3) | 4.9 ± 8.9 (3) |
| Culture Positive for Co-pathogens Source Distribution * (Total N) | 5,571 | 40,742 | 46,313 |
| Urine n (N%) | 1,754 (31.5%) | 10,409 (25.5%) | 12,163 (26.3%) |
| Blood n (N%) | 1,181 (21.2%) | 10,287 (25.2%) | 11,468 (24.8%) |
| Other n (N%) | 1,015 (18.2%) | 7,721 (19.0%) | 8,736 (18.9%) |
| Respiratory n (N%) | 1,324 (23.8%) | 5,949 (14.6%) | 7,273 (15.7%) |
| Skin/Wound n (N%) | 275 (4.9%) | 5,819 (14.3%) | 6,094 (13.2%) |
| IA n (N%) | 22 (0.2%) | 557 (1.4%) | 579 (1.3%) |

| Pathogen Type | SARS-CoV-2 Positive | SARS-CoV-2 Negative | Total |
|---------------------------------|---------------------|---------------------|----------------|
| Total Pathogens* | 6,057 | 48,051 | 54,108 |
| Gram-positive | 2,080 (34.3%) | 17,213 (35.8%) | 19,293 (35.7%) |
| <i>Staphylococcus aureus</i> | 746 (35.9%) | 6,710 (29.0%) | 7,456 (38.7%) |
| <i>Enterococcus spp.</i> | 575 (27.6%) | 4,024 (23.4%) | 4,599 (23.8%) |
| <i>Streptococcus pneumoniae</i> | 99 (4.8%) | 546 (3.2%) | 645 (3.3%) |
| Gram-negative | 2,791 (46.1%) | 21,719 (45.2%) | 24,510 (45.3%) |
| <i>Enterobacteriales</i> | 1,860 (66.6%) | 14,128 (65.1%) | 15,988 (65.2%) |
| <i>Pseudomonas aeruginosa</i> | 410 (14.7%) | 2,481 (11.4%) | 2,891 (11.8%) |
| <i>Acinetobacter baumannii</i> | 27 (1.0%) | 162 (0.8%) | 189 (0.8%) |
| Fungi | 483 (8.0%) | 2,445 (5.1%) | 2,928 (5.4%) |
| <i>Candida spp.</i> | 365 (75.6%) | 1,657 (67.8%) | 2,022 (69.1%) |
| <i>Aspergillus spp.</i> | 6 (1.2%) | 121 (5.0%) | 127 (4.3%) |
| Non-COVID-19 Virus | 599 (9.9%) | 5,908 (12.3%) | 6,507 (12.0%) |

* Including molecular detection; there can be >1 source and pathogen in the same patient admission

Conclusion: There were similar rates of positive pathogen identification among SARS-CoV-2 test positive and negative patients, which might highlight similarities in clinical presentation. However, SARS-CoV-2 positive patients had longer hospital LOS and LOS increased with positive culture. Sources of infection and pathogens varied based on a positive or negative SARS-CoV-2 result. Identifying likely causative pathogens of co-infections in the era of SARS-CoV-2 is critical for treatment optimization.

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374. Complication with Bacterial Pneumonia in Hospitalized Patients with Coronavirus Disease 2019 (COVID-19)

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Session: P-12. COVID-19 Complications, Co-infections, and Clinical Outcomes

Background: Early reports have indicated widespread empiric antimicrobial usage in patients infected with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). As data regarding bacterial complications in patients with Coronavirus Disease 2019 (COVID-19) are limited and emerging, it is important to delineate the burden of complications with bacterial pneumonia in patients with COVID-19 and its implication on antimicrobial usage.

Methods: We conducted a retrospective cohort study of all hospitalized patients diagnosed with COVID-19 based on detection of SARS-CoV-2 on RT-PCR from March 1, 2020 to May 10, 2020. Data were collected retrospectively to determine the

presence of bacterial pneumonia among patients hospitalized with COVID-19 and to identify demographics, comorbidities, or laboratory values that may help to distinguish patients with bacterial pneumonia. Fisher's exact test was used to analyze categorical data and Student's t test was used to analyze differences between means.

Results: Among 99 patients hospitalized with COVID-19 during the study period, complication with bacterial pneumonia was seen in 17 (17%) based on sputum, tracheal aspirate or lower respiratory tract cultures performed 8.9 ± 7.8 (mean ± SD) days from the detection of SARS-CoV-2 on RT-PCR. *Staphylococcus aureus* was the causative organism in 8 (47%) cases while Enterobacteriaceae were isolated in 7 (41%) cases, *Burkholderia cepacia* in one (6%) and *Rahnelia aqualis* in one (6%) case. There were no significant differences in demographics, comorbidities, or laboratory findings between patients with or without complication with bacterial pneumonia. However, those with complication with bacterial pneumonia were more likely to be intubated (24% vs. 88%, p < 0.01), on vasopressors (23% vs. 82%, p < 0.01), and require intensive care unit admission (37% vs. 94%, p < 0.01).

Table 1. Complications with Bacterial Pneumonia in Hospitalized Patients with COVID-19

| | No Bacterial Pneumonia (n=82) | Bacterial Pneumonia (n=17) | P-value |
|------------------------|-------------------------------|----------------------------|---------|
| Male | 46 (56%) | 9 (53%) | 1.00 |
| Age (mean ± SD) | 58.0 ± 19.8 | 58.2 ± 18.6 | 0.97 |
| Smoking | | | 0.59 |
| Never smoker | 42 (51%) | 10 (59%) | |
| Current smoker | 7 (9%) | 0 (0%) | |
| Prior smoker | 13 (16%) | 2 (12%) | |
| No information | 20 (24%) | 5 (29%) | |
| Comorbidities | | | |
| Lung disease | 9 (11%) | 4 (24%) | 0.23 |
| Heart disease | 12 (15%) | 4 (24%) | 0.47 |
| Immunocompromised | 12 (15%) | 3 (18%) | 0.72 |
| Diabetes | 23 (28%) | 5 (29%) | 1.00 |
| ESRD | 2 (2%) | 0 (0%) | 1.00 |
| Hypertension | 32 (39%) | 10 (59%) | 0.18 |
| Intubation | 20 (24%) | 15 (88%) | <0.01 |
| Vasopressor | 19 (23%) | 14 (82%) | <0.01 |
| ICU admission | 30 (37%) | 16 (94%) | <0.01 |
| Laboratory (mean ± SD) | | | |
| Procalcitonin | 0.60 ± 0.74 | 2.99 ± 10.1 | 0.35 |
| D-dimer | 675.7 ± 1174.8 | 1740.3 ± 2983.10 | 0.30 |
| WBC | 7.6 ± 4.0 | 7.6 ± 4.5 | 0.99 |
| Lymphocyte count | 1.0 ± 0.6 | 0.9 ± 0.6 | 0.46 |

Conclusion: Nosocomial and ventilator-associated pneumonia were commonly seen among hospitalized patients with COVID-19 requiring intubation and intensive care unit admission. With complications of bacterial pneumonia common among critically-ill patients infected with SARS-CoV-2, widespread antimicrobial usage may increase the selective pressure for antibiotic resistance in this patient population.

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375. COVID 19 infection in a Massachusetts community hospital.

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Session: P-12. COVID-19 Complications, Co-infections, and Clinical Outcomes

Background: The ongoing pandemic of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infections has led to 105690 cases and 7647 deaths in Massachusetts as of June 16.

Methods: The study was conducted at Saint Vincent Hospital, an academic health medical center in Worcester, Massachusetts. The institutional review board approved this case series as minimal-risk research using data collected for routine clinical practice and waived the requirement for informed consent. All consecutive patients who were sufficiently medically ill to require hospital admission with confirmed severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection by positive result on polymerase chain reaction testing of a nasopharyngeal sample were included.

Results: A total of 109 consecutive patients with COVID 19 were admitted between March 15 and May 31. Sixty one percent were men, the mean age of the cohort was 67. Forty one patients (37%) were transferred from nursing homes. Twenty seven patients died (24%) and the majority of the dead patients were men (62%). Fifty one patients (46%) required admission to the medical intensive care unit and 34 necessitated mechanical ventilation, twenty two patients on mechanical ventilation died (63%). The most common co-morbidities were essential hypertension (65%), obesity (60%), diabetes (33%), chronic kidney disease (22%), morbid obesity (11%), congestive heart failure (16%) and COPD (14%). Five patients required hemodialysis. Fifty five patients received hydroxychloroquine, 24 received tocilizumab, 20 received convalescent plasma and 16 received remdesivir. COVID 19 appeared in China in late 2019 and was declared a pandemic by the World Health Organization on March 11, 2020. Our study showed a high mortality in patients requiring mechanical ventilation (43%) as opposed to those who did not (5.7%). Hypertension, diabetes and obesity were highly prevalent in this aging population. Our cohort was too small to explore the impact of treatment with remdesivir, tocilizumab or convalescent plasma.

Conclusion: In this cohort obesity, diabetes and essential hypertension are risk factors associated with high mortality. Patients admitted to the intensive care unit who need mechanical ventilation have a mortality approaching 50%.

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