

Antibiotic Use Among Patients with COVID-19
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Purpose

Emerging data suggests high rates of antibiotic prescribing in COVID-19 and low rates of bacterial coinfection. Systematic reviews of current literature have found that 7% of hospitalized patients with COVID-19 had evidence of bacterial coinfection, however, more than 90% of patients received antibiotics. Increased antibiotic use raises concern for the potential impact this pandemic may have on antimicrobial resistance. There is a paucity of data to describe antibiotic use and bacterial coinfection in the setting of COVID-19. This review aims to describe current antibiotic use among patients with COVID-19 at Ascension Via Christi, St. Francis.

Methods

This study was a retrospective chart review of antibiotic use among patients admitted to Ascension Via Christi, St. Francis from July 1, 2020 to September 30, 2020. Patients were included if they were over the age of 18; were admitted to the Medical Intensive Care Unit (MICU) or 5 North during their hospitalization; and treated with ceftriaxone, cefepime, or piperacillin-tazobactam. The MICU and 5 North were primary locations reserved for patients with COVID-19; data abstraction was facilitated by location for this review. The primary outcome of this study was to describe the percentage of patients with COVID-19 treated with ceftriaxone, cefepime, or piperacillin-tazobactam during hospitalization. Secondary outcomes included average day of antibiotic initiation, average duration of antibiotic therapy, percentage of positive urinary antigen tests, number of procalcitonin tests with values less than 0.25 ng/mL, and positive respiratory culture or other culture. A positive respiratory culture was defined as any growth noted on a bronchoalveolar lavage, mini bronchoalveolar lavage, or sputum culture. A positive other culture was defined as any growth noted on cultures not obtained from the respiratory tract.

Results

At Ascension Via Christi, St. Francis from July 1, 2020 to September 30, 2020 there were 399 patients admitted to the MICU or 5 North. One or more of the evaluated antibiotics were administered to 62.9% (n=251) patients during admission. Of antibiotics administered, ceftriaxone was administered to 166 (57.4%) patients, cefepime to 81 (28.0%) patients, and piperacillin-tazobactam to 42 (14.5%) patients. The average initiation of antibiotics was day one of hospitalization; 68.9% of patients treated with the evaluated antibiotics were started day one of hospitalization. The majority of patients had antibiotics initiated in the emergency department, accounting for 48% of all day one of hospitalization orders. Antibiotics were continued for an average duration of five days (IQR 2-6; maximum 17); however, outliers in duration exceeding ten days were present.

Of the 251 patients treated with antibiotics, 20 (7.9%) had positive respiratory cultures. The majority of the positive respiratory cultures were gram-positive cocci (n=18); methicillin-resistant *Staphylococcus aureus* (n=3) and methicillin-susceptible *Staphylococcus aureus* (n=3) were isolated. There were minimal gram-negative bacilli; *Pseudomonas aeruginosa* (n=3) was isolated. Positive non-respiratory cultures were identified in 51 (20%) patients.

Conclusions

Antibiotic use among patients with COVID-19 at Ascension Via Christi, St. Francis appears to reflect what is currently being seen in the literature with high antibiotic prescribing rates, but low bacterial coinfection rates. The primary concern is the expeditious initiation of antibiotics on presentation to the emergency department. Patients presenting with COVID pneumonia may not require expedient initiation of antibiotics. Additionally, patients with COVID-19 are likely to have an infectious disease consult to manage remdesivir, convalescent plasma, and antibiotic therapy.