

January 2021

## The Prevalence of Co-Infections in Hospitalized Patients with COVID-19

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### Recommended Citation

Sarvepalli, Siri S.; El Zein, Said MD; and Chandrasekar, Pranatharthy MD, "The Prevalence of Co-Infections in Hospitalized Patients with COVID-19" (2021). *Medical Student Research Symposium*. 114.  
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Title: The Prevalence of Co-Infections in Hospitalized Patients with COVID-19

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Introduction: The Coronavirus disease 2019 (COVID-19) pandemic emerged in early 2020 and significantly altered the landscape of healthcare delivery. With the absence of a cure, treatment of hospitalized patients with COVID-19 has been particularly challenging. Physicians often treat hospitalized patients empirically with broad-spectrum antibiotics on admission due to concerns of missing an underlying, treatable co-infection. In this study, we aim to determine the rate of co-infections in hospitalized patients with SARS-CoV-2.

Methods: We conducted a retrospective study which included all patients who had a nasopharyngeal swab sample positive for SARS-CoV-2 infection detected by the Cepheid Real-Time Polymerase Chain Reaction (RT-PCT) test at the Detroit Medical Center in April 2020. Of 409 patients with SARS-CoV-2 infection, 390 had sputum or blood cultures ordered during their hospitalization. The results of each culture were examined, and the isolated organisms and date of the culture positivity were documented. We analyzed the results of non-culture tests such as urine legionella antigen, urine pneumococcal antigen, and influenza A and B PCR.

Results: Ninety four patients had a respiratory culture ordered, out of which 38 (40%) returned positive. Of these 38 patients, 12 patients had a positive culture within three days of admission. A total of 296 patients had a blood culture ordered out of which 30 (10%) returned positive. Of these 30 patients, 21 patients had a positive culture within the first three days of admission. A total of 126 urine legionella antigen tests were obtained, 0 of which returned positive. Out of the 125 urine pneumococcal antigens ordered, only 4 (3.1%) were positive. 221 patients were tested for Influenza A and B PCR, and 0 tested positive.

Conclusions: Based on our findings, respiratory co-infections appear to be uncommon on initial presentation to the hospital in patients with the COVID-19 infection. Although only 10% of the total blood cultures obtained during hospitalization returned positive, around 70% of those (21 out of 30) were positive on admission. Based on our data, urine pneumococcal and urine legionella antigens appear to have no role in the evaluation of secondary bacterial infections in patients with SARS-CoV-2 infection.

When in doubt, physicians should obtain respiratory and blood cultures to better guide management. Empiric antibiotic therapy on admission does not appear to be warranted in the majority of patients and discontinuation of empiric antibiotics should be guided based on culture results.