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DID WE NEED THOSE ANTIBIOTICS? OUTCOMES OF PATIENTS WITH COVID-19 TREATED FOR BACTERIAL SUPERINFECTION OF THE LUNGS

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PURPOSE: The COVID-19 pandemic has affected over half a billion people worldwide. Series report that up to 75% of hospitalized patients with COVID-19 receive broad-spectrum antibiotics; however, the incidence of bacterial coinfection is consistently reported to be low. The diagnosis of bacterial superinfection of the lungs (BSL) is clinical, which presents the possibility of overdiagnosis and overutilization of antibiotics. The aim of this study was to describe the outcomes of patients who were treated for a bacterial superinfection of the lungs (BSL) compared to those who were not.

METHODS: We conducted a retrospective chart review of all consecutive patients with a diagnosis of COVID-19 hospitalized at our center. We defined BSL as a documented episode of pneumonia treated with antibiotics. We collected information on demographics, comorbidities, and microbiological markers. We compared patients with and without a diagnosis of BSL in terms of intensive care unit (ICU) stay, intubation, length on mechanical ventilation, length of hospital stay (LOS) and 7-day and 30-day mortality.

RESULTS: Five hundred eighty-two patients had a diagnosis of COVID-19, of which 105 had BSL. Patients with BSL were older compared to those without BSL (mean age 74 vs 70 years) and more likely to be male (57% vs 47%), but they were similar in proportion of White patients (64 vs 63.6) and Charlson comorbidity index (5 vs 4). Patients with BSL had a higher likelihood of admission to the ICU (63% vs 19%) and higher intubation rates (31% vs 9%). BSL patients had longer mechanical ventilation (9 vs 3 days) and greater length of stay (13 vs 7). Only 17 BSL patients had sputum cultures, of which 10 were positive. None of the BSL patients had a positive Legionella urinary antigen or Streptococcus pneumoniae urinary antigen, and only 6/57 (10.5%) had a positive MRSA nasal screen. Seven-day and 30-day mortality were not statistically different between BSL and non-BSL patients (p=0.18, p=0.65 respectively). Interestingly, Cox proportional hazard analysis adjusted for age, sex, race, CCI and ICU stay yielded a significantly reduced mortality at 7 and 30-day among BSL patients (HR=0.2 CI [.1-0.7], p=.0106, HR=0.5 [CI .3-0.8], p=0.0101, respectively).

CONCLUSIONS: Patients with BSL received more intense supportive care, and had a longer ICU stay, yet did not have a greater mortality. When adjusting for age, sex, race, CCI and ICU, there was a significant reduction in mortality. It is tempting to interpret these finding as an effect of antibiotics; however, we did not record COVID-19-specific treatments such as steroids, tocilizumab and remdesivir. It is likely that the BSL patients received more steroids, which have been associated with reduced mortality. In our population, microbiological testing was performed in a minority of patients, and it was therefore not a reliable marker of true infection. It is possible that many patients in the BSL group did not truly have a bacterial infection.

CLINICAL IMPLICATIONS: Patients with a diagnosis of BSL were sicker, but we observed no difference in unadjusted mortality. Studies on the outcomes of the BSL among COVID-19 patients should account for the effect of concurrent COVID-19 specific therapy.

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