333. Comparing COVID-19-related Morbidity and Mortality between Patients with and without Substance Use Disorder: A Retrospective Cohort Study

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Session: P-14. COVID-19 Complications, Co-infections, and Clinical Outcomes

Background. Early data suggest that people with substance use disorder (SUD) who develop coronavirus disease 2019 (COVID-19) have increased intubation and mortality rates when compared to those without SUD. Information on other COVID-19-related complications in this population is limited. We evaluated COVID-19 outcomes in patients with and without SUD.

Methods. We created a retrospective cohort of patients with COVID-19 admitted to an urban safety net hospital from 3/16/2020 to 4/8/2020. Inclusion criteria were admission with laboratory-confirmed severe acute respiratory syndrome coronavirus 2 and age greater than 18 years. SUD included alcohol use disorder or heavy alcohol use as defined by the National Institute on Alcohol Abuse and Alcoholism, use of cocaine, non-prescribed opioids or amphetamines. Primary outcome was inpatient mortality. Secondary outcomes were clinical complications (intubation, secondary infections, renal failure, venous thromboembolism, stroke, hepatitis, myocardial infarct, multisystem organ failure) and resource utilization (length of stay, intensive care unit [ICU] admission, ICU days, readmission). We used multivariable regression to assess factors associated with mortality and length of stay, and univariate analyses for other outcomes.

Results. Of 409 included patients, 70 (17.1%) had SUD. Those with SUD were more likely to be male and have pulmonary disease or hepatitis C. There were no differences in other comorbidities, mean age or race/ethnicity. After multivariable analysis, SUD was not associated with mortality (aOR 1.60; 95% CI, 0.60-3.81). Similarly baseline oxygenation defined as the ratio of oxygen saturation to fraction of inspired oxygen (aOR 1.57; 0.11-13.0) and administration of immunomodulatory therapy (tocilizumab, sarilumab or anakinra) (aOR 1.41; 0.65-3.01) did not affect mortality. In contrast, age (aOR 1.06; 1.03-1.09), sex (aOR 2.30; 1.04-5.47) and obstructive sleep apnea (aOR 4.07; 1.64-9.66) were associated with mortality. We did not find any associations with secondary outcomes.

Conclusion. Our findings suggest that substance use alone may not increase COVID-19 adverse outcomes. Future studies should evaluate these results in the current period of improved COVID-19 therapy.

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334. Impact of Overall Dexamethasone Exposure on Development of Invasive Pulmonary Aspergillosis in Hospitalized Patients with COVID-19

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Background. Abbreviated courses of corticosteroids, such as dexamethasone, have demonstrated significant improvements in clinical outcomes among patients infected with COVID-19, although chronic corticosteroid use can predispose patients to opportunistic infections. The RECOVERY trial investigators showed reduced 28-day mortality among patients treated with 6 mg/day dexamethasone for up to 10 days, however in clinical practice the dosage and duration of dexamethasone therapy can vary widely based on severity of disease and provider discretion. Upon observing an anecdotal increase in the number of patients presenting with potential invasive aspergillosis during the third wave of COVID-19, we sought to evaluate the impact of overall dexamethasone exposure on the development of invasive pulmonary aspergillosis.

Table 1. Diagnostic certainty of invasive pulmonary aspergillosis (IPA) among COVID-19 patients receiving dexamethasone.

	Probable IPA (*strict EORTC criteria*) (n=7)	Probable IPA (*expanded criteria*) (n=13)
Mycological evidence		
Positive galactomannan assay (>0.5 x2 or >1.0 x1)	2 (29)	3 (23)
Aspergillus sp. isolated from sputum culture	5 (71)	10 (76)
Radiologic findings		
CT-chest performed	7 (100)	12 (92)
Cavitating lesions	3 (43)	3 (23)
Host factors		
Received >40mg prednisone equivalent/day for **≥7 days** prior to mycological evidence of IPA	n/a	12 (92)
Received >40mg prednisone equivalent/day for **≥3 weeks** prior to mycological evidence of IPA	5 (71)	5 (38)
Received T- or B-cell immunosuppressant prior to mycological evidence of IPA (eg, tocilizumab)	3 (42)	3 (23)

*Data presented as n (%) unless otherwise specified. IPA = invasive pulmonary aspergillosis; EORTC = European Organization for Research and Treatment of Cancer.

Methods. Patients presenting to our institution from Dec. 2020 – Jan. 2021 with positive PCR for SARS-CoV-2 were screened for dexamethasone therapy. Assignment of high vs low dose dexamethasone groups were retrospectively made based on overall dexamethasone exposure. Low dose dexamethasone assignment was restricted to a total exposure of no more than 78 mg during a patient's hospitalization. Adjudication of invasive pulmonary aspergillosis was made based on criteria that included host factors, radiologic findings, clinical factors, and mycological evidence.

Results. Dexamethasone therapy was provided to 202 patients admitted to the hospital with COVID-19. Invasive pulmonary aspergillosis was determined to be probable in n=7 patients based on European Organization for Research and Treatment of Cancer (EORTC) criteria, and in n=13 patients based on expanded criteria. Patients in the low dose dexamethasone group were less likely to be diagnosed with probable IPA based on EORTC criteria (n=0, 0% on low dose vs. n=7, 11% on high dose) as well as expanded criteria (n=9, 5% on low dose vs. n=11, 17% on high dose), p< 0.001.

Conclusion. Patients hospitalized with COVID-19 receiving high-dose dexamethasone may be at a higher risk of opportunistic infections such as invasive pulmonary aspergillosis compared to patients who receive low-dose dexamethasone therapy. Further investigation is needed to obtain higher certainty of IPA diagnosis.

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335. *Staphylococcus aureus* Bacteremia as a Potential and Severe Complication from Intramuscular COVID-19 Vaccine Injection

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Session: P-14. COVID-19 Complications, Co-infections, and Clinical Outcomes

Background. Abscess formation and bacteremia following intramuscular injections are rare complications from vaccine injections, and they are most commonly seen in immunocompromised individuals. *Staphylococcus aureus* is one of the etiological agents that can be found during this complication. Spain started to vaccine its population at the beginning of 2021. We noticed an important increase in *Staphylococcus aureus* infections and bacteremia during this period of time, leading us to study the relationship with previous vaccination.

Methods. In this case series we present a cohort of twenty patients with *Staphylococcus aureus* bacteremia (SAB) during the study period (January 1, 2021 through May 31, 2021), attended in our Institution (Hospital Nuestra Señora de Sonsoles, Ávila, Spain). We tried to establish or at least create the debate of a possible relationship with a previous COVID-19 vaccine.

Results. From January 1, 2021 through May 31, 2021, 20 SAB were identified in our Institution. 13/20 patients were vaccinated (all of them with the mRNA vaccine type). 5/13 (38%) were male and 8/13 (62%) female. 10 of them (77%) received at least one dose of the vaccine before hospital admission, and 3 of them (23%) after admission. From the 10 previously COVID-19-vaccinated patients treated for SAB (CVPSAB), 4 died - 40% (2 deaths directly related to the SAB).

Conclusion. Although SAB may be a rare side effect after intramuscular injections or vaccines, it always implies an outstanding risk due to potential complications. Even if our study is not able to directly establish a link between SAB and previous vaccination, it implies a possible association between the vaccine injection and a threating disease (SAB). We should be aware of this probable relationship, so that we can maximize preventive measures.

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336. COVID-19 and *Pneumocystis jiroveci* Pneumonia

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Background. More accounts of opportunistic infection in COVID-19 patients are emerging. At our institution, we identified 2 COVID-19 patients with *Pneumocystis jiroveci* pneumonia (PJP) opportunistic infection. This prompted a review of the literature to identify trends in patient characteristics, risk factors, and outcomes in this population.

Methods. A literature review was conducted using PubMed that identified 13 other patients with both COVID-19 and PJP infection. Age, gender, human immunodeficiency virus (HIV) status, other immunocompromised states, time between COVID-19 and PJP diagnosis, and clinical outcomes were captured for analysis.

Results. Eleven patients were male. The average age was 56 years. All but 2 patients were immunocompromised. At time of PJP diagnosis, seven patients had newly diagnosed HIV and one had known, well-controlled HIV. One patient had rheumatoid arthritis receiving leflunomide, 1 had ulcerative colitis receiving budesonide and sulfasalazine, 2 patients had multiple myeloma whereby both were on lenalidomide, 1 patient was a renal transplant recipient immunosuppressed on tacrolimus, mycophenolate, and methylprednisolone, and 1 patient had chronic lymphocytic leukemia getting fludarabine, cyclophosphamide, and rituximab. Nine patients had positive COVID-19 and PJP tests performed within 7 days of one another. One patient tested positive for PJP 54 days into admission for COVID-19. This patient received high dose steroids and tocilizumab for initial COVID-19 infection. Three patients were re-hospitalized with PJP after a recent admission for COVID-19 pneumonia, with a mean time to readmission of 25 days. One of these 3 patients had no treatment for COVID-19, while 2 received steroids. Five of the total 15 patients (33%) died.

Conclusion. COVID-19 treatments with high dose steroids and tocilizumab can make patients vulnerable for opportunistic infection with PJP. Furthermore, COVID-19 is known to cause lymphopenia which may further increase this risk. A diagnosis of concomitant PJP can be especially challenging due to nearly identical radiographical findings. Serum beta-D glucan and HIV testing can be especially helpful in this situation, and there should be a low threshold for performing bronchoalveolar lavage.

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