

Covid-19 Immunization and Disease Burden for Patients with Alcohol Use Disorder Evaluation Through the Use of an Electronic Database

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Abstract:

Background: Alcohol consumption has increased in adults during the COVID 19 pandemic. Patients with Alcohol Use Disorder (AUD) are at a greater risk of negative outcomes from COVID 19. These include, contracting COVID-19, having a severe COVID-19 illness course, and experiencing an exacerbation of their Alcohol Use Disorder with an associated increase in morbidity and mortality. During the course of the pandemic a vaccine for COVID 19 was developed that has been demonstrated to be effective against COVID-19.

Methods: We accessed the nationwide EPIC EMR (electronic medical record) database through the Cosmos application to analyze the COVID-19 infection rates, hospitalizations and deaths in the 1/20/2020-9/15/2021 timeframe. We assessed vaccination rates of patients with an encounter between 4/15/21-9/15/21 in an effort to capture patients who would have an updated medical record that had their vaccination status documented in the EMR.

Results: COVID-19 infection rates were higher among patients with AUD at 7.8% compared to those without AUD at 6.9% ($p < .0001$). The incidence of hospitalization was higher among patients with AUD (1.5%) compared to patients without AUD (0.8%), $p < .0001$. The risk of death was also higher among patients with AUD (0.3%) compared to those without AUD (0.2%), $p < .0001$. The vaccination rate for patients with AUD was lower among patients with AUD (50.5%) compared to those without AUD (52.4%, $p < .0001$).

Conclusions: This study demonstrates that there is a disproportionate burden of COVID-19 infections, hospitalizations, and mortality among patients with AUD. The impact of COVID-19 on the alcohol use patterns is more pronounced among patients 65 and older, males, African Americans and patients of Hispanic ethnicity.

Key Words: covid-19; vaccination; alcohol use disorder; disease burden

Introduction:

The breakout of the coronavirus disease-2019 (COVID-19) pandemic and associated social isolation has created a prime environment for increasing alcohol consumption. There is evidence that the social conditions including social distancing and the temporary closing of recreational facilities and recovery centers such as Alcohol's Anonymous due to efforts to curb the spread of COVID-19 have produced an increase in the consumption of alcohol. Psychological conditions related to stress and anxiety also was found to be a factor in increasing the number of heavy drinking episodes in American adults. There have also been reports that COVID-19 has had a disproportionate effect on patients diagnosed with Alcohol Use Disorder (AUD). In one recent study individuals with a

recent diagnosis of substance use disorder (SUD) were found to have a significantly higher risk of developing COVID-19 as compared to individuals without. The same study found that individuals with SUD also have higher rates of COVID-19 related hospitalizations and death [1].

Alcohol use and misuse and its effects on mental health and dependence.

One public health measure to try to help control the pandemic is vaccination. Vaccination rates are often dependent on a patient's belief that vaccines are safe and effective. We also know that vaccines offer a promising solution, however vaccine uptake in this population is limited with nearly 1/2 of patients with SUD deciding to take the vaccine. A 2020

survey asking patients in a residential SUD treatment program regarding their intentions to undergo vaccination found that almost one third of individuals (31.6%) reported vaccine hesitancy and 10.8% did not intend to get vaccinated [2]. Participants in the survey reported their reasons for hesitancy or refusal included vaccine-specific concerns, a need for more information, antivaccine beliefs and attitudes about the efficacy and safety of vaccines, and a lack of trust [3] To assist efforts of increasing vaccination uptake in vulnerable populations it is important to understand potential barriers to vaccine uptake. It is also important to assess resulting the severity of the impact of COVID-19 on patients with Alcohol Use Disorder including hospitalization and death. This study was designed to assess the burden of COVID-19 disease in patients with AUD and determine their vaccination rates. This study also assesses the rates of vaccination and the impact of COVID-19 disease on patients of different races and those of an advanced age. Our premise, based on prior preliminary work, was that patients with alcohol use disorder would have lower vaccination rates and a higher disease burden compared to patients without alcohol use disorder.

Methods:

Our study utilized the Epic systems COSMOS database. The Epic Systems is an electronic medical record system with a database of approximately 130 million patients at the time of this study. We accessed the data base using the Cosmos application. The Cosmos database is composed of submissions from organizations that participate in the Epic electronic medical record system. Participating organizations contribute a HIPAA-defined limited data set for all patients into the Cosmos database. Individuals from participating organizations can obtain a user license to query the database. The states with the highest population include California, Texas, Illinois and New York. The Cosmos dataset includes self-identified gender, self-declared racial and ethnic identifies, and age among other demographic parameters. The data is reported as frequency with 95 percent confidence intervals. Statistical comparisons were made using the Chi-square test using a $p < 0.05$ to indicate significance. Our Institutional Review Board (IRB) determined that the study did not require IRB approval as It uses a HIPAA complaint limited dataset for analysis. It is noteworthy that AUD is not a searchable diagnosis in the SNOMED or ICD-10 classification system. Therefore, we searched for the SNOMED classifications of alcohol abuse and alcohol dependence. Snomed is the coding terminology platform maintained by the International Health Terminology Standard Organization. We analyzed the COVID-19 infection rates, hospitalizations and deaths in the 1/20/2020-9/15/2021 timeframe. We assessed vaccination rates of patients with an encounter between 4/15/21-9/15/21 in an effort to capture patients who would have an updated medical record that had their vaccination status documented. Any vaccination documented in the medical record was used regardless of whether or not the patient completed the vaccination series in the case of the Pfizer or Moderna product.

We assessed vaccination rates of patients with an encounter between 4/15/21-9/15/21 in an effort to capture patients who would have an updated medical record that had their vaccination status documented. For this analysis we utilized full vaccination defined according to CDC criteria as 2 doses of the Pfizer or Moderna vaccine or one dose of the Johnson and Johnson vaccine. We did not assess for vaccine booster in this analysis. The data was analyzed using the Chi-Square test. Our Institutional Review Board deemed this exempt research as it uses a HIPAA delimited database. Our hypothesis was that the patient's without vaccination would have higher burden of illness from COVID-19 infections.

Demographics:

37,293,409 patients were analyzed of whom 309,022 (8.3%) patients were found to have alcohol use disorder as defined by a SNOMED diagnosis of alcohol abuse or alcohol dependence. There was a male predominance at 58.6%. Fourteen percent of the patients were African American and 9.5% were Hispanic. 28.9% of the patients were age 65 or older.

Results:

Data analysis revealed that COVID-19 infection rates were higher among patients with AUD at 7.8% compared to those without AUD at 6.9% ($p < .0001$). The incidence of hospitalization was higher among patients with AUD (1.5%) compared to patients without AUD (0.8%), $p < .0001$. The risk of death was also higher among patients with AUD (0.3%) compared to those without AUD (0.2%), $p < .0001$. The vaccination rate for patients with AUD was lower among patients with AUD (50.5%) compared to those without AUD (52.4%, $p < .0001$). In addition, we found differences among sub-groups for vaccination rates, hospitalization rates, and mortality.

Discussions:

This study demonstrates that there is a disproportionate burden of COVID-19 infections, hospitalizations, and mortality among patients with AUD. The impact of COVID-19 on the alcohol use patterns is more pronounced among patients 65 and older, males, African Americans and patients of Hispanic ethnicity. Older adults also have a greater burden of medical comorbidities increasing their risk. We also know that African Americans bear a higher burden of disease and experience a higher mortality rate from COVID 19 infections compared to Caucasians. 2 Furthermore, African Americans with SUD had higher rates of comorbidities such as HIV and diabetes

Vaccination rates in patients with AUD were found to be lower than patients without AUD. Amongst patients with AUD, vaccination rates were higher in older adults. Patients with AUD who are 65 years of age or older may have a higher vaccination rate due to an increased perceived vulnerability to severe COVID-19 infection and generational differences in a relationship with healthcare providers. [4] We also surmise that the improved vaccination rate of patients age 65 years or older with Alcohol Use Disorder may be due to a higher utilization of health care resources and perhaps due to enhanced public education about the dangers of comorbid COVID-19 infection and advanced age. Vaccination rates were lower in African Americans in this study. COVID-19 vaccine mistrust among African American patients has been posited to be a consequence of current and historical institutionalized racism in healthcare and mistrust of government. [5,6] A surprising finding in our study was the higher vaccination rate of patients of Hispanic ethnicity with AUD. It could be that these rates reflect a combination of targeted outreach and education to the Hispanic community as well as reducing cultural and linguistic barriers related to access.

Our study analyzing the relationship of AUD, COVID-19 immunization and COVID-19 disease burden also demonstrated an increase in hospitalization and mortality for people with AUD. Patients without AUD had lower hospitalization rates after contracting COVID-19 as compared to those with a diagnosis of AUD across different races and genders. Furthermore, patients consistently had a higher mortality rate if they were diagnosed with both AUD and COVID-19 even when accounting for differences in gender, race and age.

This study emphasizes the need for outreach to various populations to reduce the burden of COVID-19 infection. One positive finding during the pandemic was an increase in the use of telehealth to try to reach vulnerable populations. [7] This study demonstrates that improved education and resources are needed to improve the vaccination rates of patients with Alcohol use disorder. In order to address vaccine mistrust

healthcare providers will need to address mistrust and negative attitudes toward COVID-19 vaccines.

Limitations:

There were a couple limitations of our study. The data is dependent on multiple hospital systems and many staff members for entry into the Epic System. There may not be a clear concordance between the SNOMED diagnoses and a more formal assessment of the DSM criteria for AUD. Data being uploaded into an EMR is dependent on staff diligence. Patients may not have their vaccination status updated or they may not have had an encounter within the time period captured in this study.

Conclusions:

Patients with Alcohol Use Disorder have lower COVID-19 vaccination rates which manifests into a greater risk of hospitalization and a higher mortality from COVID-19 illness. This study demonstrates the need for a greater emphasis on reaching and educating vulnerable populations. Additional research on the vaccination rates for other illness is needed to reveal if this trend continues for other vaccines or specifically the COVID-19 vaccine. Also, research on the best means to improve vaccine education and implementation is also warranted.

	AUD	Without AUD	
Gender			
Male	1.94%	0.9%	P<.001
Female	1.5%	0.6%	P<.001
Age			
<65 years	1.65%	0.6%	P<.001
Over 65	2.4%	0.1%	P<.001
Race			
African American	2.6%	1.2%	P<.001
Not African American	2.0%	0.7%	P<.001
Ethnicity			
Hispanic	2.4%	1.1%	P<.001
Not Hispanic	1.7%	0.7%	P<.001

Table 1: Incidence of Covid Hospitalization among Patients with and Without Alcohol Use Disorder

	AUD	Without AUD	
Gender			
Male	0.3%	0.2%	P<.001
Female	0.2%	0.1%	P<.001
Age			
<65	0.2%	0.1%	P<.001
Over 65	0.7%	0.5%	P<.001
Race			
African American	0.34%	0.2%	P<.001
Not African American	0.26%	0.16%	P<.001
Ethnicity			
Hispanic	0.31%	0.15%	P<.001
Not Hispanic	0.27%	0.16%	P<.001

Table 2: COVID mortality rate among patients with and without alcohol use disorder

	AUD	Without AUD	
Gender			
Female	50.1%	51.6%	P<.001
Male	50.8%	52.9%	P<.001
Age			
<65 years	46.0%	47.6%	P<.001
Over 65	66.2%	64.1%	P<.001
Race			
African American	44.1%	44.0%	P<.01
Not African American	52.0%	53.8%	P<.001
Ethnicity			
Hispanic	51.6%	50.9%	P<.001
Not Hispanic	50.3%	52.5%	P<.001

Table 3: COVID-19 Vaccination Rate among patients with and without alcohol use disorder

Declaration of Competing Interest: The authors report no conflicts of interest.

1. Barocas, J.A., (2020). Business not as usual - Covid-19 vaccination in persons with substance use disorders. N. Engl. J. Med. 384, e6.

References:

2. Wang, Q.Q., Kaelber, D.C., Xu, R., Volkow, N.D., (2020). COVID-19 risk and outcomes in patients with substance use disorders: analyses from electronic health records in the United States. *Mol. Psychiatry* 26 (1), 30–39.
3. Masson, Carmen L., McCuistian, Caravella, Straus, Elana, Elahi, Sania, Chen, Maggie, Gruber, Valerie A., Le, Thano, Guydish Joseph. (2021). COVID-19 vaccine trust among clients in a sample of California residential substance use treatment programs *Drug and Alcohol Dependence*
4. Fisher, K.A., Bloomstone, S.J., Walder, J., Crawford, S., Fouayzi, H., et al., (2020). Attitudes toward a potential SARS-CoV-2 vaccine: a survey of U.S. adults. *Ann. Intern. Med.* 173, 964–973.
5. Bogart, L.M., Ojikutu, B.O., Tyagi, K., Klein, D.J., Mutchler, M.G., et al., (2021). COVID-19 related medical mistrust, health impacts, and potential vaccine hesitancy among black americans living with HIV. *J. Acquir. Immune Defic. Syndr.* 86 (2), 200–207.
6. Bunch, L., (2021). A tale of two crises: addressing Covid-19 vaccine hesitancy as promoting racial justice. *HEC Forum Interdiscip. J. Hosp. Ethical Leg. Issues* 33 (1–2), 143–154.
7. Kumar N, Janmohamed K, Nyhan K, Martins SS, Cerda M, Hasin D, et al. (2022) Substance, use in relation to COVID-19: A scoping review. *Addict Behav.* Apr;127: 107213.



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