Determining the Impact of COPD on the Severity of COVID-19 Infection: 2020-2021 Nationwide Analysis

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INTRODUCTION

Clinical studies have shown conflicting reports regarding the impact COPD on the outcomes of patients with COVID-19 infection, with few studies reporting worse outcomes and some studies showing better outcomes. This National Inpatient Sample study aimed to determine the impact of COPD on the severity of outcomes in patients with COVID-19 infection.[1-4]

METHODS

The authors identified patients hospitalized with COVID-19 infection and a history of COPD from the 2020–2021 National Inpatient Sample database. STATA/MP 17.0 (StataCorp LLC, College Station, Texas, USA) software was used for statistical analysis. Multivariate logistic regression analysis was then performed.

RESULTS

There was a total of 818,011 patients hospitalized with COVID-19 infection and 908,337 patients with a history of COPD (Tables 1 and 2). The patients with COVID-19 infection were stratified based on their COPD status. Among them, 788,284 patients had COVID-19 infection without COPD, while 29,727 patients had both COVID-19 infection and COPD. The mean age was 61.3 years for patients with COVID-19 infection without COPD, compared to 71.7 years for those with COPD. People who are White constituted the largest ethnic group in both categories. Patients in the lowest national income quartile, and those with Medicaid insurance, constituted the largest group among the national income quartile and insurance groups, respectively, in both categories. The length of hospital stay was 8.2 days for patients with COVID-19 infection without COPD and 7.5 days for those with COPD ($p<0.001$). The mortality rate was 13.1% among patients with COVID-19 infection without COPD and 12.9% for those with COPD ($p=0.54$). The unadjusted odds ratio (OR) of mortality in patients with COVID-19 infection with COPD was 0.99. After adjustment for age, sex, race, Charlson comorbid index, national income quartile, and insurance, the adjusted OR of mortality was 0.62 ($p<0.001$), indicating that the mortality rate was significantly lower among patients with COVID-19 infection with COPD, compared to those without COPD. The unadjusted OR for invasive ventilation in patients with COVID-19 infection with COPD was 0.67, and the adjusted OR was 0.56 ($p<0.001$), indicating that the need for invasive ventilation was significantly lower in patients with COPD compared to those without COPD.

CONCLUSION

The authors' analysis of the National Inpatient Sample database suggests that COPD was not a major risk factor for severe COVID-19 infection. Patients with both COVID-19 infection and COPD had shorter lengths of stay, a lesser need for invasive ventilation, and a lower mortality rate compared to those without COPD.

Table 1: Demographic and clinical characteristics from the 2020–2021 National Inpatient Sample database.

Variables	COVID-19 infection without COPD (N=788,284)	COVID-19 infection with COPD (N=29,727)	p value
Age (years)	61.3	71.7	<0.001
Sex			
Male	51.9%	49.1%	<0.001
Female	48.1%	50.9%	
Mortality	13.1%	12.9%	0.54
LOS	8.2 days	7.5 days	<0.001
Ethnicity			
White	56.5%	73.1%	<0.001
African American	17.5%	15.8%	
Hispanic	18.5%	6.8%	
Asian/Pacific Islander	2.9%	1.4%	
Native American	0.9%	0.7%	
Others	3.7%	2.1%	
National income quartile			
1–38,999	32.9%	38.1%	<0.001
39,000–47,999	27.2%	28.6%	
48,000–62,999	23.1%	19.8%	
>63,000	16.8%	13.4%	
Insurance			
Medicaid	48.8%	76.5%	<0.001
Medicare	15.9%	10.4%	
Private	31.0%	11.8%	
Uninsured	4.2%	1.3%	
Charlson comorbid index			
0	32.1%	0%	<0.001
1	25.7%	17.6%	
2	15.1%	21.7%	
≥3	27.0%	60.7%	

LOS: length of stay.

Table 2: Outcomes and adjusted odds ratio.

	Odds ratio (95% CI)	p value
Invasive ventilation	0.56 (0.54–0.59)	<0.001
Mortality	0.62 (0.59–0.64)	<0.001

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