

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

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INTRODUCTION

The impact of bronchiectasis on the severity of COVID-19 infection has been contradictory. Some studies report that bronchiectasis is a risk factor for severe COVID-19 infection, whereas others have found no relationship between bronchiectasis and the severity of COVID-19 infection. This National Inpatient Sample study aimed to determine the impact of bronchiectasis on the severity of COVID-19 infection.¹⁻³

METHODS

The authors identified patients hospitalized with COVID-19 infection and a history of bronchiectasis from the 2020–2021 National Inpatient Sample database (Tables 1 and 2). 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 31,439 patients with a history of bronchiectasis. The patients with COVID-19 infection were stratified based on their bronchiectasis status. Among them, 815,213 patients had COVID-19 infection without bronchiectasis, while 2,798 patients had both COVID-19 infection and bronchiectasis. The mean age was 61.6 years for patients with COVID-19 infection without bronchiectasis, compared to 69.7 years for those with bronchiectasis. People who are White constituted the largest ethnic group, and patients with Medicaid insurance constituted the largest insurance group in both categories. Patients in the lowest income quartile constituted the largest group among patients with COVID-19 infection without bronchiectasis, whereas those with bronchiectasis mostly belonged to the second highest income quartile. The length of hospital was 8.2 days for patients with COVID-19 infection without bronchiectasis and 16.7 days for those with bronchiectasis ($p < 0.001$). The mortality rate was 13.0% among patients with COVID-19 infection without bronchiectasis and 21.5% for those with bronchiectasis ($p < 0.001$). The unadjusted odds ratio (OR) of mortality in patients with COVID-19 infection with bronchiectasis was 1.82. After adjustment for age, sex, race, Charlson comorbid index, national income quartile, and insurance, the adjusted OR of mortality was 1.37 ($p < 0.001$), indicating that the mortality rate was significantly higher among patients with COVID-19 infection with bronchiectasis, compared to those without bronchiectasis. The unadjusted OR for invasive ventilation in patients with COVID-19 infection with bronchiectasis was 2.12, and the adjusted OR was 1.89 ($p < 0.001$), indicating that the need for invasive ventilation was significantly higher in patients with bronchiectasis.

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

Variables	COVID-19 infection without bronchiectasis (N=815,213)	COVID-19 infection with bronchiectasis (N=2,798)	p value
Age	61.6	69.7	<0.001
Sex			
Male	51.8%	52.9%	0.23
Female	48.2%	47.1%	
Mortality	13 %	21.5 %	<0.001
LOS	8.2 days	16.7 days	<0.001
Ethnicity			
White	57.1%	58.5%	<0.001
African American	17.5%	13.3%	
Hispanic	18.0%	17.9%	
Asian/Pacific Islander	2.9%	5.5%	
Native American	0.9%	1.2%	
Others	3.6%	3.5%	
National income quartile			
1–38,999	33.1%	23.9%	<0.001
39,000–47,999	27.2%	25.5%	
48,000–62,999	23.0%	27.2%	
>63,000	16.6%	23.4%	
Insurance			
Medicaid	49.8%	66.4%	<0.001
Medicare	15.7%	10.3%	
Private	30.4%	21.0%	
Uninsured	4.1%	2.3%	
Charlson comorbid index			
0	31.1%	0%	<0.001
1	25.4%	29.5%	
2	15.3%	23.3%	
≥3	28.1%	47.2%	

LOS: length of stay.

Table 2: Outcomes and adjusted odds ratio.

	Odds ratio (95% CI)	p value
Invasive ventilation	1.89 (1.71–2.09)	<0.001
Mortality	1.37 (1.24–1.52) <0.001	<0.001

CONCLUSION

The authors’ analysis of the National Inpatient Sample database suggests that bronchiectasis is a major risk factor for severe COVID-19 infection. Patients with both COVID-19 infection and bronchiectasis had longer lengths of stay, a higher need for invasive ventilation, and a higher mortality rate compared to those without bronchiectasis.

References

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