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Introduction

Pneumothorax (PTX) and pneumomediastinum (PM) have been reported among hospitalized patients with COVID-19. It can occur among patients breathing spontaneously or as a result of barotrauma from invasive positive-pressure ventilation or from medical procedures. We aim to study the clinical features and outcomes of pneumothorax and pneumomediastinum within 48 hours of hospitalization among COVID-19 patients

Methods

We conducted a multicenter retrospective study among the hospitalized adults with COVID-19 who had pneumothorax and pneumomediastinum within 48 hrs. of admission between November 2020 and December 2021. Cases were identified using ICD 10 codes. Electronic medical records were reviewed after Institutional Board approval.

Demographic characteristics	
Mean Age ± SD in years	57 ±20.4%
Females	61.9%
RACE	
Caucasean	66.6%
African American	23.8%
Unknown/Other	9.5%

Comorbidities	
Obesity	38%
Chronic Obstructive Pulmonary Disease	42.8%
Diabetes Mellitus Type 2	19.0%
Hypertension	42.8%
End Stage Renal Disease	4.7%
Coronary Artery Disease	9.5%
Tobacco Use	57.1%

Percentage of Patients based on NIH COVID Severity Classification	
Mild	19%
Moderate	33.3%
Severe	42.8%
Critical	4.7%

Results

We identified a total of 21 patients, 12 (57%) only had PTX, 6 (28%) only had PM, and 3(14%) had both. Mean age for the cohort was 57 yrs, 13 (61.9%) were females, and 14 (66.6%) were whites. Chronic lung and end-stage renal diseases were noted among 9 (42.8%) patients followed by obesity in 9 (38%) and diabetes in 4 (19%). A total of 12 (57.1%) patients have smoked tobacco. At the time of hospitalization, 12 (57%) patients had oxygen saturation ≥94% and 9 (43%) had <94%. PTX and PM on admission chest x-ray were noted in 12(57%) and 4 (19%) respectively. 3 (14%) developed them after intubating and/ or after BiPAP. Patients were treated with steroids (90.4%), remdesivir (61.9%), interleukin-6 inhibitors (23.8%), and convalescent plasma (9.5%). Chest tube was placed in 7 (33.3%) patients and thoravent in 1 (4.7%) patient. Complications were septic shock (14.2%) and deep venous thrombosis (9.5%). There were 4(19%) deaths.

Treatment	
Steroids	90.4%
Remdesivir	61.9%
IL-6 inhibitor	23.8%
Convalescent Plasma	9.5%
Chest tube insertion	33.3%
Thoravent	4.7%
COMPLICATION	
Deep Vein Thrombosis	9.5%
Septic Shock	14.2%
Death	19%

Discussion / Conclusion

Spontaneous PTX can be a presenting sign for COVID-19. We noted higher complications and mortality among the COVID-19 patients with PTX and PM than reported in literature. Clinicians should be aware of this potential occurrence, requiring close monitoring and aggressive management.

References

- Geraci TC, Williams D, Chen S, Grossi E, Chang S, Cerfolio RJ, Bizakis C et al. Incidence, management, and outcomes of patients with COVID-19 and pneumothorax. Ann Thorac Surg 2021; article in press.
- Rajdev K, Spaniel AJ, McMillan S, Lahan S, Boer B, Birge J, Thi M, Pulmonary Barotrauma in COVID-19 Patients With ARDS on Invasive and Non-Invasive Positive Pressure Ventilation.
- Massa Zantah, Eduardo Dominguez Castillo, Ryan Townsend, Fusun Dikengil & Gerard J. Criner, Pneumothorax in COVID-19 disease- incidence and clinical characteristics
- Chen N, et al. Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study. Lancet. 2020;395:507–13.
- Geraci TC, Williams D, Chen S, Grossi E, Chang S, Cerfolio RJ, Bizakis C et al. Incidence, management, and outcomes of patients with COVID-19 and pneumothorax. Ann Thorac Surg 2021; article in press. <https://doi.org/10.1016/j.athoracsur.2021.07.097>