

The Rate of Ward to Intensive Care Transfer and Its Predictors Among Hospitalized COPD Patients, a Retrospective Study in a Local Tertiary Center in Saudi Arabia

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Introduction

- Recent advances in clinical and translational research have confirmed chronic obstructive pulmonary disease (COPD) complex phenotyping as well as its associated extra-pulmonary consequences¹. Comorbidities coexisting with COPD imply a more severe course of the disease, with more frequent exacerbations and hospitalizations¹⁻³. People who have two or more exacerbations per year have a lower quality of life, a faster loss of lung function, more hospitalizations, and a higher mortality rate⁴⁻⁷.
- A previous study conducted in Saudi Arabia assessed the outcomes of patients hospitalized with exacerbation of COPD within the hospital setting, specifically focusing on in-hospital and intensive care unit (ICU) outcomes⁸. However, the predictors and prevalence of ICU admission in hospitalized COPD patients have not been well elucidated in prior studies in the region.

Objectives: To investigate the prevalence of ICU admission and its predictors among hospitalized COPD patients.

Methods and Materials

- 🔍 An observational retrospective study was conducted.
- 📄 All patients with a confirmed diagnosis of COPD according to the GOLD guidelines between 28 February 2020 and 1 March 2023 at Al-Noor Specialist Hospital were included in this study. Patients were excluded if a preemptive diagnosis of COPD was made clinically without spirometry evidence of fixed airflow limitation.
- 📊 Descriptive results were presented as frequency (percentage) for categorical variables and mean (SD) for continuous variables to estimate the prevalence of ICU admission. Predictors of ICU admission among hospitalized COPD patients were determined using logistic regression analysis.
- 🔍 The SPSS (Statistical Package for the Social Sciences) version 25 was used to perform all statistical analysis.

Results

- A total of 705 patients with COPD were included in this study.
- The mean age was 65.4 (25.3) years. Around 12.4% of the hospitalized patients were admitted to the ICD.
- Logistic regression analysis identified that older age (OR; 1.92, (1.41–2.62)), smoking (OR; 1.60 (1.17–2.19)), and having specific comorbidities (Hypertension (OR; 1.98 (1.45–2.71)), Diabetes mellitus (OR; 1.42 (1.04–1.93)), GERD (OR; 2.81 (1.99–3.96)), Ischemic heart disease (OR; 3.22 (2.19–4.75)), Obstructive sleep apnea syndrome (OR; 2.14 (1.38–3.33)), stroke (OR; 4.51 (2.20–9.26))) were predictors of ICU admissions among patients with COPD.

Table 1 Medications use history

Variable	Frequency	Percentage
SABA	640	90.80%
LAMA	567	80.40%
LABA	418	59.30%
ICS	390	55.30%
Systematic corticosteroids	139	19.70%
Home oxygen and BIPAP	55	7.80%
Home oxygen	37	5.20%

Table 2 Predictors of COPD hospital admissions

Variable	Odds ratio (95% confidence interval)	p-value
Gender		
Females (Reference group)	1.00	
Males	1.05 (0.77–1.43)	0.770
Mean age		
Below 65 years old	1.00	
65 years and over	1.92 (1.41–2.62)	≤ 0.001
Mean Body Mass Index (BMI)		
Below 29.2 kg/cm ²	1.00	
29.2 kg/cm ² and over	1.12 (0.82–1.52)	0.489
Smoking status		
Non-smoker (Reference group)	1.00	
Ex-smoker	0.57 (0.41–0.78)	≤ 0.001
Current smoker	1.60 (1.17–2.19)	0.003
Receive home care		
No (Reference group)	1.00	
Yes	6.32 (3.32–12.01)	≤ 0.001
Comorbidities		
Hypertension	1.98 (1.45–2.71)	≤ 0.001
Diabetes mellitus	1.42 (1.04–1.93)	0.027
Gastroesophageal disease (GERD)	2.81 (1.99–3.96)	≤ 0.001
Ischemic heart disease	3.22 (2.19–4.75)	≤ 0.001
Obstructive sleep apnoea syndrome	2.14 (1.38–3.33)	≤ 0.001
Heart failure	5.16 (2.93–9.10)	≤ 0.001
Chronic kidney disease	1.75 (0.92–3.31)	0.087
stroke	4.51 (2.20–9.26)	≤ 0.001
Connective tissue diseases	0.46 (0.17–1.25)	0.128
Tumour or malignancy	3.12 (1.03–9.40)	0.044
Hemiplegia	2.22 (0.82–6.02)	0.119
Peripheral vascular diseases	0.63 (0.17–2.40)	0.498

Conclusions

Our study found that a step-up approach to inpatient COPD management requires admission to the ICU in 12.4%, for which age, smoking status, cardiovascular, and stroke were important predictors.

Further clinical research is needed to provide a validated model that can be incorporated into clinical practice to monitor this patient population during admission and identify at-risk individuals for early transfer to higher acuity settings and ICUs.

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