










A retrospective study on chronic obstructive pulmonary disease severity and cardiovascular comorbidities

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Introduction: Chronic obstructive pulmonary disease (COPD) is a global health issue characterized by progressive airflow limitation and respiratory symptoms^{1,2}. Recent research have shown that patients with COPD often have a higher prevalence of cardiovascular diseases (CVD), including hypertension, coronary artery disease, and congestive heart failure^{3,4}. This retrospective study aims to compare prevalence of CVD based on COPD severity.

Patients and Methods: Data were collected from patients with COPD attending Pulmonology Clinic between April 2023, and October 2023. We divided patients into Global Initiative for Chronic Obstructive Lung Disease (GOLD) stages I or II (FEV1 >50%) and GOLD stages III or IV (FEV1 <50%). We compared groups regarding the frequency of cardiovascular comorbidities, gender, age, treatments, current smoking status, COPD exacerbations in the past year, and hospitalizations. Statistical analysis used IBM SPSS Statistics 26. Categorical variables were analysed with Fisher's exact test, while numerical variables underwent Student's t-test. All p-values were two-tailed, with significance set at p = 0.05.

Results: In this study of 109 COPD patients, those in GOLD stages I or II (n=56) had a mean age of 67.7±12.9 years, and those in GOLD stages III or IV (n=53) had a mean age of 70.6±6.9 years (p=0.2). In GOLD stage III or IV group, had more male patients, higher exacerbations rate, and increased long-term oxygen therapy usage compared to GOLD stage I or II (**Table 1**). Mean FEV1 in GOLD I or II patients was

TABLE 1. Baseline characteristics of participants.

	N (%)			P*
	GOLD stage I or II	GOLD stage III or IV	Total	
Gender				
Male	29 (51.8)	40 (75.5)	69 (63.3)	0.02
Female	27 (48.2)	13 (24.5)	40 (36.7)	
Cardiovascular disease				
Yes	37 (66.1)	35 (66.0)	72 (66.1)	>0.9
No	19 (33.9)	18 (34.0)	37 (33.9)	
Long-term oxygen therapy				
Yes	1 (1.8)	10 (18.9)	11 (10.1)	0.003
No	55 (98.2)	43 (81.1)	98 (89.9)	
Current smoking				
Yes	27 (48.2)	17 (32.1)	44 (40.4)	0.1
No	29 (51.8)	36 (67.9)	65 (59.6)	
Exacerbation of COPD over the one year-period				
Yes	15 (26.8)	33 (62.3)	48 (44.0)	<0.001
No	41 (73.2)	20 (37.7)	61 (56.0)	

COPD = Chronic obstructive pulmonary disease; GOLD = Global Initiative for Chronic Obstructive Lung Disease; * Fisher's Exact Test

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65.1±11.1%, while in GOLD III or IV patients, 33.9±10.6% (p<0.001). Hospitalization rates were significantly lower for the former group (0.09±0.3 vs. 0.4±0.6, p=0.005). **Figure 1** shows the frequency of CVD depending on GOLD stage, no statistical significance was found between the two. GOLD stage I or II patients significantly more often have LAMA and LABA+LABA in their therapy, while GOLD stage III or IV patients have SABA+SAMA and IC+LABA+LAMA (**Figure 2**). Notably, the choice of cardiovascular therapy did not differ significantly between these groups (**Figure 3**).

Conclusion: Despite prior research, we could not confirm the COPD severity-CVD link. Further research is vital to emphasize the need for personalized care, considering the limitation of a small patient sample.

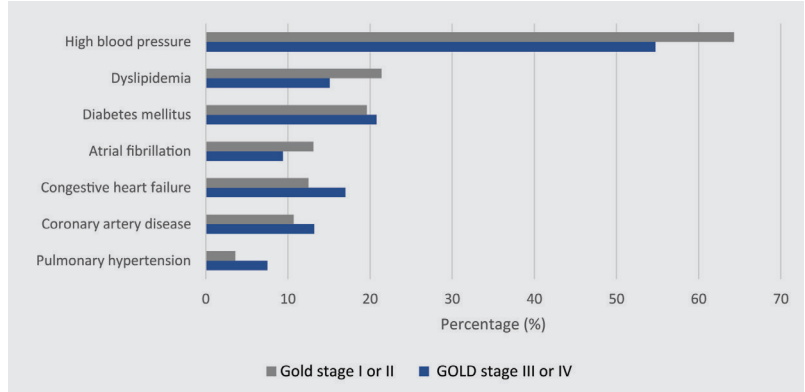


FIGURE 1. Comorbidities and cardiovascular diseases among patients depending on the severity of chronic obstructive pulmonary disease.

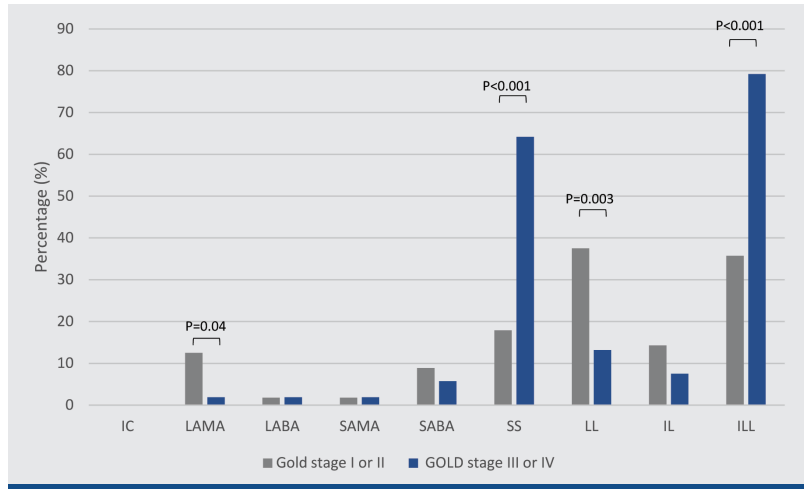


FIGURE 2. The difference in the choice of therapy depending on the GOLD stage (Fisher's Exact Test).
 IC = inhaled corticosteroid; LAMA = long-acting muscarinic antagonist; LABA = long-acting β2 agonist; SAMA = short-acting muscarinic antagonist; SABA= short-acting β2 agonist; SS = SAMA+SABA; LL = LAMA+LABA; IL = IC+LABA; ILL = IC+LAMA+LABA.

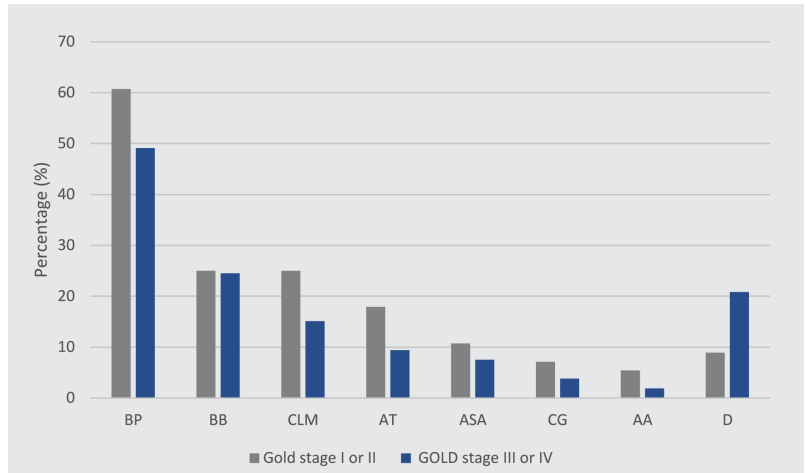


FIGURE 3. The distribution of the use of cardiovascular therapy between Global Initiative for Chronic Obstructive Lung Disease (GOLD) stage I or II and GOLD stage III or IV groups.
 BP = blood pressure medication; BB = beta-blockers; CLM = cholesterol-lowering medication, AT = anticoagulant therapy; ASA = aspirin; CG = cardiac glycosides; AA = aldosterone antagonists; D = diuretics.

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