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Original Research Article

FREQUENCY OF GASTROESOPHAGEAL REFLUX DISEASE AMONG PATIENTS PRESENTING WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE

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ABSTRACT

Background: *Chronic obstructive pulmonary disease (COPD) is a prevalent and progressive respiratory condition frequently associated with comorbidities that complicate its management. Gastroesophageal reflux disease (GERD) is increasingly recognized as a common coexisting condition that can worsen respiratory symptoms and disease outcomes in COPD patients.* ***Objective:*** *To determine the frequency of gastroesophageal reflux disease (GERD) among patients presenting with chronic obstructive pulmonary disease (COPD).* ***Study Design:*** *Cross-sectional study.* ***Setting:*** *Conducted at a tertiary care hospital,* the Department of Pulmonology, Mardan Medical Complex, Mardan, Pakistan. ***Duration of Study:*** 12 December 2024 to 12 May 2025. ***Methods:*** *A total of 150 patients aged 30 to 70 years, of either gender, diagnosed with COPD, were enrolled in this study. Diagnosis of COPD was confirmed based on spirometric criteria (post-bronchodilator FEV_1/FVC ratio <0.70). GERD was diagnosed clinically based on the presence of retrosternal burning or acid regurgitation occurring at least twice weekly over the preceding month. Descriptive statistics were used for analysis; results were expressed as mean ± standard deviation and percentages.* ***Results:*** *The mean age of participants was 54.21 ± 12.03 years. There were 94 males (62.7%) and 56 females (37.3%). COPD severity was classified as mild in 12 patients (8.0%), moderate in 66 (44.0%), severe in 63 (42.0%), and very severe in 9 patients (6.0%). GERD was diagnosed in 78 patients, yielding a frequency of 52.0% among the COPD cohort. The prevalence of GERD appeared to correlate with increasing COPD severity.* ***Conclusion:*** *GERD was identified in more than half of the COPD patients in this study, with a notable association between GERD frequency and COPD severity. These findings underscore the need for proactive GERD screening in the management of COPD to improve patient outcomes and quality of life.*

Keywords: Gastroesophageal Reflux Disease, Chronic Obstructive Pulmonary Disease, Severity, Prevalence

INTRODUCTION

Chronic obstructive pulmonary disease (COPD) refers to a group of conditions previously classified as chronic bronchitis as well as emphysema. COPD is a prevalent and manageable condition marked by progressive airflow restriction along with tissue damage. This condition has been attributed to structural alterations in the lungs resulting from chronic inflammation triggered by extended exposure to harmful particles, primarily cigarette smoke. Chronic inflammation leads to airway constriction and reduced lung elasticity. The disease usually presents with symptoms such as cough and sputum production. Symptoms may vary from asymptomatic manifestations to respiratory failure (1, 2). Additionally, nearly 50% of COPD development is linked to abnormal lung growth caused by smoking exposure during the perinatal period and respiratory tract infections (3, 4). Consequently, a variable disease trajectory, as well as prognosis, is unavoidable. As lung function deteriorates, respiratory symptoms as well as exacerbation events associated with COPD manifest; furthermore, systemic effects may arise as the disease advances. Exacerbation frequency and severity typically increase with the worsening of COPD, particularly in individuals with previous instances of exacerbations (5-7).

Gastro-oesophageal reflux disease (GERD) is characterised by retrograde flow of contents of the stomach into the oesophagus or other areas such as the oral cavity, larynx, leading primarily to inflammation of the oesophageal mucosa. This condition ranks among the most prevalent diseases faced by gastroenterologists and primary care clinicians (8-10). Geographical variations exist in the distribution of GERD diagnoses. The average incidence of this condition ranges from 10% to 20%. GERD exhibits similar prevalence rates in both males and females (11-12). In the absence of heartburn and acid regurgitation, fewer symptoms, such as hoarseness, nausea, abdominal pain, and dyspepsia, are unlikely to be attributed to GERD (13). A study found that the frequency of GERD (53.5%) was higher in patients with COPD (14).

GERD is a common comorbidity in patients with COPD, and its presence can exacerbate both respiratory and digestive symptoms, leading to a significant impact on quality of life. As there is no local data available on this subject, the goal of this study is to determine the frequency of GERD among patients presenting with COPD at our healthcare facility. The findings of this study will be helpful for our medical professionals in achieving the goal of enhancing diagnosis and improving patient management by identifying effective strategies for treating both conditions simultaneously.

METHODOLOGY

This cross-sectional study was conducted at the Department of Pulmonology, Mardan Medical Complex, Mardan, after taking ethical clearance from the hospital. The study was conducted from December 12, 2024, to May 12, 2025. One hundred fifty patients were enrolled using consecutive non-probability sampling, with the sample size calculated based on an assumed GERD frequency of 53.5% (14) from prior literature, at a 95% confidence level and 8% absolute precision. Patients aged between 30 and 70 years with a confirmed diagnosis of COPD as per spirometric criteria (post-bronchodilator FEV1/FVC ratio <0.70) were included. Exclusion standards included patients with left ventricular failure, peptic ulcer disease, interstitial lung disease, renal impairment or liver cirrhosis. Consent was obtained from all patients.

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Data collection involved recording baseline demographic details, including age, gender, body mass index (BMI), literacy status, employment status, socioeconomic background, and place of residence. Comorbid conditions, including diabetes, hypertension and smoking history, were documented along with the severity of COPD. The diagnosis of GERD was established clinically based on the presence of retrosternal burning or acid regurgitation occurring at least twice weekly over the past month. All assessments were conducted under the supervision of a consultant pulmonologist with a minimum of five years of post-fellowship experience.

SPSS 25 was used for analysis. Age, BMI and COPD duration were calculated as mean ± standard deviation. Demographics, comorbidities, GERD and severity of COPD were evaluated using frequencies and percentages. Stratified analyses were performed to examine the association between demographics, comorbidities, and the severity of COPD and GERD. Chi-square tests were applied with statistical significance set at $p \leq 0.05$.

RESULTS

We had 150 patients with COPD, with a mean age of 54.21±12.03 years. The average duration of COPD was 7.23 ± 3.53 years, and the mean body mass index (BMI) was 24.98 ± 1.35 kg/m². Males comprised the majority at 94 (62.7%), while females accounted for 56 (37.3%). The remaining demographics are presented in Table 1.

Regarding comorbidities, 52 (34.7%) were smokers. Diabetes was present in 56 (37.3%) Patients. Hypertension was observed in 69 (46.0%) (Table 2). The severity of COPD varied with 12 (8.0%) classified as mild, 66 (44.0%) as moderate, 63 (42.0%) as severe and 9 (6.0%) as very severe (Figure 1).

The frequency of gastroesophageal reflux disease (GERD) among the cohort was 78 (52.0%) (Table 3). Stratifications can be observed in Table 4.

Table 1: Demographic profile

Demographics		n	%
Gender	Male	94	62.7%
	Female	56	37.3%
Socioeconomic status	Low	48	32.0%
	Middle	84	56.0%
	High	18	12.0%
Literacy status	Literate	59	39.3%
	Illiterate	91	60.7%
Employment status	Employed	78	52.0%
	Unemployed	72	48.0%
Place of living	Rural	71	47.3%
	Urban	79	52.7%

Table 2: Comorbidities

Comorbidities		n	%
Smoking	Yes	52	34.7%
	No	98	65.3%
Diabetes	Yes	56	37.3%
	No	94	62.7%
Hypertension	Yes	69	46.0%
	No	81	54.0%
COPD severity	Mild	12	8.0%
	Moderate	66	44.0%
	Severe	63	42.0%
	Very severe	9	6.0%

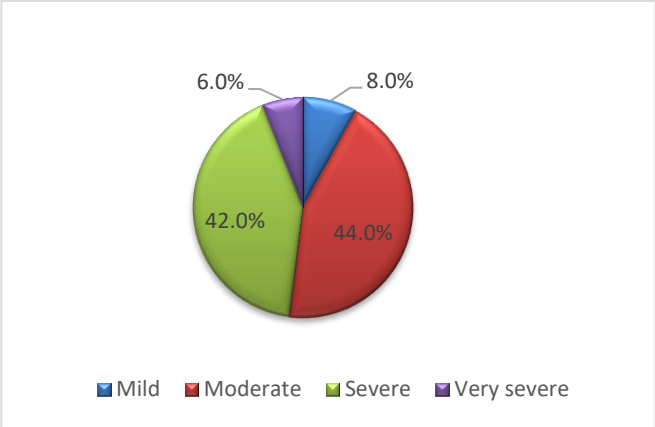

Figure 1: Severity of COPD

Table 3: Frequency of GERD

GERD	n	%
Yes	78	52.0%
No	72	48.0%

Table 4: Stratification of GERD with various parameters

Parameters		GERD				P value
		Yes		No		
		n	%	n	%	
Age distribution (Years)	30 to 45	27	34.6%	16	22.2%	0.10
	46 to 60	19	24.4%	28	38.9%	
	> 60	32	41.0%	28	38.9%	
BMI (Kg/m2)	18 to 24.9	40	51.3%	39	54.2%	0.72
	> 24.9	38	48.7%	33	45.8%	
Duration of COPD (Years)	1 to 7	39	50.0%	43	59.7%	0.23
	> 7	39	50.0%	29	40.3%	
Gender	Male	49	62.8%	45	62.5%	0.96
	Female	29	37.2%	27	37.5%	
Socioeconomic status	Low	26	33.3%	22	30.6%	0.04
	Middle	38	48.7%	46	63.9%	
	High	14	17.9%	4	5.6%	
Literacy status	Literate	35	44.9%	24	33.3%	0.14
	Illiterate	43	55.1%	48	66.7%	
Employment status	Employed	46	59.0%	32	44.4%	0.07
	Unemployed	32	41.0%	40	55.6%	

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Place of living	Rural	38	48.7%	33	45.8%	0.72
	Urban	40	51.3%	39	54.2%	
Hypertension	Yes	35	44.9%	34	47.2%	0.77
	No	43	55.1%	38	52.8%	
Smoking	Yes	31	39.7%	21	29.2%	0.17
	No	47	60.3%	51	70.8%	
Diabetes	Yes	27	34.6%	29	40.3%	0.47
	No	51	65.4%	43	59.7%	
COPD severity	Mild	3	3.8%	9	12.5%	0.001
	Moderate	28	35.9%	38	52.8%	
	Severe	38	48.7%	25	34.7%	
	Very severe	9	11.5%	0	0.0%	

DISCUSSION

Our study investigated the frequency of GERD among 150 patients presenting with COPD. The findings revealed a substantial burden of GERD affecting 52% patients. This prevalence aligns remarkably closely with several regional and international studies.

Kakar et al. showed a GERD frequency of 51.67% in their cohort of 180 COPD patients (15). Wahab et al. observed 53.5% among 217 COPD patients (14). Usman et al. documented a rate of 43.16% (16). Kiani et al. (2024), utilising 24-hour objective pH monitoring in severe COPD patients, found an even higher prevalence of 66.7% (17). This consistent evidence across diverse studies confirms that GERD is a common comorbidity in COPD, affecting approximately half to two-thirds of this patient population. Our finding of 52.0% sits comfortably within this established range, reinforcing the significant overlap between these two chronic conditions.

The demographic profile of our cohort offers interesting points of comparison. The mean age was 54.21±12.03 years, slightly younger than the 58.21±12.23 years reported by Kakar et al. and the 58.37±8.36 years reported by Usman et al. (15, 16). This younger age might reflect local demographic trends or variations in healthcare access. Wahab et al found a higher mean age of 61.92 years (14).

Males were in the majority in our sample (62.7%), which is consistent with the male predominance (66.67%) noted by Kakari et al (15). Extreme skew was observed (90.5%) in Usman et al.'s heavy-smoker cohort (16). Notably, our study captured a higher proportion of females (37.3%), which is notable, compared to Usman et al. (37.3%), but similar to Wahab et al. (57.6%), who reported 57.6% females (14). This highlights the increasing recognition of COPD in women, potentially linked to non-smoking risk factors.

Socioeconomically, a majority (56.0%) belonged to the middle-income group, with a significant portion (32.0%) in the low-income bracket and a high illiteracy rate (60.7%). These factors, less frequently detailed in previous studies, provide crucial context for understanding the patient population and potential barriers to healthcare.

Regarding COPD severity, our distribution observed a similar proportion of severe COPD (42.0%) compared to Wahab et al's 41.5% (14). Kakar et al. documented a 40.0% proportion of severe COPD but a lower proportion of very severe cases (6.0% vs. 10.0%) (15). Moderate COPD was the largest category (44.0%), similar to Wahab et al 45.2% and Kakar et al.'s 45.0% (14, 15). Interestingly, Kakar et al. and Usman et al. demonstrated a clear trend of increasing GERD frequency with worsening COPD severity (15, 16). Our stratified analysis also showed that GERD was higher in patients with severe COPD.

The smoking prevalence was 34.7% which was lower than the 90.5% reported by Usman et al., as they specifically selected heavy smokers (>20 pack-years) (16). This lower rate might reflect a broader inclusion of COPD patients beyond just heavy smokers, perhaps including more non-smoking patients.

CONCLUSION

We conclude that the frequency of GERD was higher in our study in COPD patients (52%), while we observed a notable association of COPD severity with GERD.

DECLARATIONS

Data Availability Statement
All data generated or analysed during the study are included in the manuscript.

Ethics approval and consent to participate
Approved by the department Concerned. (IRB-692/BKMC)

Consent for publication
Approved

Funding
Not applicable

CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTION

HIDAYAT ULLAH (Trainee Medical Officer)
Data Analysis, Data Entry, Data Collection, Manuscript Drafting, and Review of Manuscript.
***SAJJAD ALI* (Associate Professor)**
Conception of Study, Development of Research Methodology Design, Critical input, Final Approval of Draft
***ASAD ULLAH* (Trainee Medical Officer)**
Review of Literature
***MUHAMMAD AFTAB* (Trainee Medical Officer)**
Review of Literature.

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