Frequency of Gastroesophageal reflux disease in patients with Chronic Obstructive Pulmonary disease admitted to Pulmonology Ward Khyber Teaching Hospital

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AW ZUH SA conceived idea, RF RA WA drafted the study, AW WA collected data, ZUH RU RF did statistical analysis & interpretation of data, AW SA RU critical reviewed manuscript, All approved final version to be published.

Declaration of conflicting interests

The Authors declares that there is no conflict of interest.

Abstract

Background: Chronic obstructive pulmonary disease (COPD) is a type of obstructive lung disease characterized by partially reversible airflow limitation. COPD has two clinico-pathological types including emphysema and chronic bronchitis. These two factors vary from person to person. If frequency of Gastroesophageal reflux disease (GERD) is found to be higher in COPD patients it will help in deciding whether to routinely assess COPD patients for the likelihood of GERD or not and manage adequately.

Objective: To know about the frequency of GERD in patients with COPD effect relationship between GERD and COPD regarding the clinical significance of GERD in patients with COPD as it has a prognostic value in patients admitted to Pulmonology Ward KTH.

Methodology: A Descriptive cross-sectional study conducted at Chest Ward, Khyber Teaching Hospital (KTH), Peshawar from April 2017 till October 2017. In this study 217 patients were observed. Patients (aged 18-70 years) were worked up with detailed history and clinical examination. Then, those satisfying the inclusion and exclusion criteria were subjected to spirometry and the Q-questionnaire. Spirometry was performed by the same qualified technician for all patients and interpreted by the same consultant of Pulmonology, who was a fellow of CPSP and graded according to GOLD guidelines into grade 1-4 on the basis of post bronchodilator FEV1. After filling the Q-questionnaire in patients with established COPD, the frequency of GERD were calculated among the total cases of COPD included in the study.

Results: In performed study, the mean age was 61.92 years with standard deviation ± 11.619. Forty two percent patients were male and 57.6% patients were female. The frequency of GERD was 53.5% in patients with COPD.

Conclusion: Our study concludes that the frequency of gastro-esophageal reflux disease (GERD) was 53.5% in patients with COPD.

Key words: Gastro-esophageal reflux disease; Chronic obstructive pulmonary disease; Peshawar; Pakistan

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Introduction

COPD is a type of Obstructive Lung Disease which is characterized by partially and reversible airflow limitation.[1] COPD has two Clinico-pathological types including emphysema and chronic bronchitis. The relative contribution of these two factors vary from person to person.[2]

COPD develops as chronic inflammatory response to inhaled irritants and recurrent infections. The inflammatory cells in development of COPD include

neutrophils, granulocytes and macrophages. Those who smoke additionally, have T1 lymphocyte involvement as well.[3] This inflammation leads to decrease of the airways size due to scarring within them. This contributes to the inability to breathe out freely, as during exhalation, the pressure in the chest compresses the airways making them collapse.[4] Amongst the different complications of COPD, GERD is of paramount importance and is a chronic medical condition where stomach contents coming back into the esophagus and throat resulting in symptoms such as, bad taste of acid in the mouth, heartburns, chest pain, nausea, breathing problems, and carries of the teeth.[5] In untreated GERD, complications such as esophagitis, Barrett's esophagus and esophageal strictures, develop.[6]

GERD may affect pulmonary disease severity. Moreover, GERD has been found as an important indicator of acute exacerbations of COPD.[6-7] Therefore, the early identification and treatment of GERD in COPD patients is important. The diagnosis of GERD relies on a thorough clinical assessment and subjective evaluation by using a pretested and validated questionnaire, called as Q-questionnaire.8 On the basis of a mixture of diagnostic and clinical approaches, the prevalence of GERD in COPD ranges from 17% to 78%.[8] In another study, the frequency of GERD in COPD patient was observed to be 62%.[9]

The rationale of this study will be, "To document the frequency of GERD in patients with COPD."As the studies done abroad showed controversial results, and no local studies are available on this important issue, despite the fact that COPD is a very frequent reason for admission to the general medical wards in our hospitals, determining the actual prevalence of GERD in the Pakistani population suffering from COPD is of paramount importance.

If frequency of GERD is determined to be higher in COPD patients, it will help in deciding whether to routinely assess COPD patients for the likelihood of GERD or not. And manage adequately. Moreover this study will also provide basis for further studies in order to determine the cause and effect relationship between GERD and COPD regarding the clinical significance of GERD in patients with COPD as it has a prognostic value.

Objective

To know about the frequency of GERD in patients with COPD admitted to Pulmonology Ward KTH.

Operational Definitions

COPD: This was defined by using spirometry as the gold standard, showing the forced expiratory volume in one second (FEV-1) to forced vital capacity (FVC) a ratio of less than 70% with no or partial reversibility with bronchodilators.

GERD: It was measured using GERD-Q Questionnaire with a score of 08 or more was labeled as GERD.

Methodology

This was a descriptive cross sectional study conducted at Chest Ward, Khyber Teaching Hospital (KTH), Peshawar, Pakistan from April 2017 to October 2017 for 6 months.

Sample size: Sample size was 217, calculated on the basis of 17% prevalence of GERD in COPD patients8,and by using 5% margin of error and 95% confidence interval under the WHO formula for sample size determination in health studies.

Sample technique

Consecutive Non-probability sampling.

Inclusion Criteria

1. All in-patients with established COPD.
2. Both genders
3. Patients aged 18 to 70 years
4. Any disease severity or duration of COPD

Exclusion Criteria

1. Patients who have pulmonary disorder other than COPD like asthma, interstitial lung disease and so forth.
2. Patients with left ventricular failure, kidney disease, Cushing syndrome, Addison disease, thyroid dysfunction, diabetes and cirrhosis.
3. Patient diagnosed with peptic ulcer disease or gastric carcinoma.
4. Patients on gastro-toxic medications like steroids, NSAIDs, SSRIs and so forth.
5. Patients with a history of hiatus hernia or previous surgery for GERD.
6. Patients on anti ulcer drugs.

The above mentioned conditions act as confounders and if included had introduce bias in the study results.

Data Collection Procedure

After getting approval from the hospital ethics committee to conduct the study, data was collected from all those patients with COPD (as per inclusion criteria). Patients (aged 18-70 years) were worked up with detailed history and clinical examination. Then, those satisfying the inclusion and exclusion criteria were subjected to spirometry and the Q-questionnaire. Spirometry was performed by the same qualified technician for all patients and

interpreted by the same consultant of Pulmonology, who was a fellow of CPSP and graded according to GOLD guidelines into grade 1-4 on the basis of post bronchodilator FEV1. Annexure attached.

After filling the Q-questionnaire in patients with established COPD, the frequency of GERD were calculated among the total cases of COPD included in the study. All data was recorded on a proforma especially designed for this purpose. Strict exclusion criteria had followed to control confounders and study bias.

Statistical Analysis

Data was stored and analyzed by the statistical program SPSS Version 20. All the quantitative variables like age, final score on Q-questionnaire and duration of COPD etc were analyzed for mean ± standard deviation. Frequencies and percentages were calculated for qualitative variables like gender and GERD. GERD was stratified amongst age, gender, disease duration, disease severity and so forth to see effect modification. Post stratification Chi square test was applied in which P value ≤0.05 was considered as significant value. All the results were presented on charts or tables.

Results

In this study age distribution among 217 patients was analyzed. Mean age was 61.92 years with standard deviation ± 11.619 and majority of patients were above age 31 years (Table 1). Majority of patients 125 (57.6%) patients were female. Duration of COPD among 217 patients was analyzed and most of 110 (51%) patients had COPD range from 1 to10 years with mean duration was 12 years with standard deviation ± 8.721 (Table 1).

Severity of COPD among 217 patients was analyzed as 16(7.4%) patients had mild COPD, 98(45.2%) patients had moderate COPD, 90(41.5%) patients had severe COPD and 13(6.0%) patients had very severe COPD (Table 1).

Final score on Q-Questionnaire among study cases was analyzed as 101(46.5%) patients had final score 1-7 while 116 (53.5%) patients had final score 8-15 with mean final score was 9 with standard deviation ± 5.093 (Table 2).

Frequency of gastro-esophageal reflux disease (GERD) among 217 patients was analyzed as 116 (53.5%) patients had gastro-esophageal reflux disease while 101(46.5%) patients didn't had gastro-esophageal reflux disease (Table 3)

Stratification of gastro-esophageal reflux disease (GERD) with respect to age, gender, disease duration, disease severity is given in table 4 by using chi square test.

Table 1: Basic Characteristics of study cases

Characteristics	Frequency	Percentage
Gender		
Male	92	42.4
Female	125	57.6
Age distribution (Years)		61.92
31-40	8	4
41-50	44	20
51-60	66	30
61-70	99	46
Duration of COPD (Years)		12 Years
1-10	110	51
11-20	88	41
21-30	19	8
Severity of COPD		
Mild	16	7.4
Moderate	98	45.2
Severe	90	41.5
Very Severe	13	6.0

Table 2: Final score on Q-Questionnaire (n=217)

Final score	Frequency	Percentage
1-7	101	46.5%
8-15	116	53.5%
Total	217	100%

Mean final score was 9 with SD ± 5.093

Table 3: Frequency of Gastro-Esophageal Reflux disease (GERD) (n=217)

GERD	Frequency	Percentage
Yes	116	53.5%
No	101	46.5%
Total	217	100%

Table 4: Stratification of Gastro-Esophageal Reflux Disease (GERD) w.r.t Age Distribution (n=217)

Characteristics	GERD			P-value
	Yes	No	Total	
Age (Years)				
30-40	04	04	08	
41-50	26	18	44	
51-60	31	35	66	0.5952
61-70	55	44	99	
Gender				
Male	41	51	92	0.0242
Female	75	50	125	
Duration of COPD (Years)				
1-10	55	55	110	0.0886
11-20	54	34	88	
21-30	07	12	19	
Severity of COPD				
Mild	07	09	16	0.1029
Moderate	49	98	98	
Severe	49	90	90	
Very Severe	11	13	13	

Discussion

COPD is a type of obstructive lung disease characterized by partially reversible airflow limitation.1 COPD has two clinico-pathological types including emphysema and chronic bronchitis. The relative contribution of these two distinct factors vary from person to person.[2]

Our study shows that mean age was 61.92 years with standard deviation ± 11.619. Forty two percent patients were male and 57.6% patients were female. The frequency of gastro-esophageal reflux disease (GERD) was 53.5% in patients with COPD

Similar results were observed in another study conducted by Lee AL et al10 in which the prevalence of GERD in COPD ranges from 17% to 78%.

"Similar results were observed in another study conducted by Casanova C et al11 in which the frequency of GERD in COPD patient was observed to be 62%.

Chronic obstructive pulmonary disease (COPD) has been one of the major causes of mortality and morbidity in Pakistan.

Similar results were observed in another study conducted by Bor S et al12 in which the frequency of GERD (Heartburn/Regurgitation once a week or more) was 25.4%, 17.0%, 19.4% and occasional symptoms (less than weekly) were 21.2%, 16.3% and 27.0% of patients with asthma, COPD and controls, respectively."

Usman U13 had reported that out of 95 cases of COPD, 38.95% (n=37) were between 40-60 years of age, while 61.05% (n=58) had >60 years of age, common age was 58.37+8.36 years, 90.5% (n=86) were male and 9.5% (n=9) were females. Frequency of GERD in COPD patients was recorded in 43.16 % (n=41), more over he concluded that the frequency of GERD is high among patients with COPD. So, it is recommended that every patient who present with COPD, should be sort out for GERD. However, it is also required that every setup should have their surveillance in order to know the frequency of the problem.

Our results also correlated with another study done by Khalil A14 in Karachi, where the incidence of gastro esophageal reflux disease in chronic obstructive pulmonary disease (COPD) was 39.7%.

Khattab A15 had reported that the frequency of GERD in COPD patients was 53.3% in the moderate group, 73.3 in the severe group by endoscopy & was 6 6.6% in the moderate group, 93.3 % in the severe group by biopsy being more prevalent in the severe group of COPD. GERD severity increases as the degree of COPD increases (there were more patients with advanced grades among severe COPD than the moderate group). GERD increases with increase in the smoking (pack/year) both in moderate & in the severe groups. Moreover, there was increase in the frequency

of exacerbations of COPD in GERD patients both in moderate & in the severe groups, the above study is in agreement with the findings of the study that GERD is associated with COPD, however, being the limitation of the current study we did not stratify the frequency according to the severity of COPD and causative factors of GERD i.e. smoking etc.

Conclusion

Our study concludes that the frequency of gastro-esophageal reflux disease (GERD) was 53.5% in patients with COPD among study cases in our region. More and longer duration of studies need to find out exact relation of GERD and COPD.

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