

Frequency and Severity of COPD in Smokers

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ABSTRACT

Objective: To determine the frequency and severity of COPD in smokers working at Services Hospital/SIMS, Lahore by using spirometry.

Study design: Cross-sectional survey.

Subjects & methodology: This study was conducted at Department of Pulmonology, Services Hospital, Lahore from July 2010 to February 2011. Total 100 cases (Doctors/paramedical staff working in Services Hospital, Lahore) were included in this study. Patients were labeled as having COPD if FEV₁/FVC < 0.70. Severity of COPD, the classification cutoffs were mild (FEV₁ > 80%), moderate (FEV₁ 80-50%), severe (FEV₁ 50-30%), very severe (FEV₁ < 30%), and ratio of FEV₁/FVC, < 0.70 in all the cases.

Results: Number of pack years 5-30 were most common (Table-3). COPD was developed in 42 patients (42.0%). Out of these 42, severity of chronic obstructive pulmonary disease (COPD) as follows: mild 20 (47.7%), moderate 14 (33.3%), severe 7 (16.7%) and very severe 1 (2.3%). Out of these 42 patients with COPD, 39 (92.8%) were males and 3 (7.2%) were females.

Conclusion: The higher prevalence of COPD in smokers clearly showed the effectiveness and a rationale to conduct screening in the most target group (smokers).

Key words: Nasal endoscope, COPD, smokers, FEV₁, FVC.

INTRODUCTION

Chronic obstructive pulmonary disease (COPD) as a complex disease with genetic and environmental compound is one of the leading causes of death worldwide. This disease is characterized by lower airway inflammation, and increases risk of lung cancer in smokers.¹

Active smoking is accepted as the most important risk factor for the development of chronic obstructive pulmonary disease (COPD), and is responsible for over 70% of cases in high income countries, although less (40%) in lower income countries.² The remaining risk is attributed to a number of environmental factors, including occupational exposure to dust and fumes, and indoor and outdoor air pollution.³

Environmental inhaled noxious particles have been known to play a role in several lung diseases, including chronic obstructive pulmonary disease (COPD) and lung cancer, the deadliest malignancy in the world in both sexes. Of the known noxious agents, tobacco smoking is the leading preventable cause of death worldwide and is a recognized risk for the development of both diseases.⁴

As in lung cancer, smoking exposure is the most important risk factor for the development of COPD, accounting for 80% to 90% of all cases.

COPD affects an estimated 8% to 10% of the general adult population, 15% to 20% of the smoking population, and 50% to 80% of lung cancer patients (with substantial smoking histories).⁵

The main cause of COPD is smoking⁶ and COPD often manifests itself after someone has been smoking more than 20 cigarettes a day over 20 years (20 pack years). A smoker who is sensitive to cigarette smoke may therefore have spirometric changes between the ages of 40 to 45 years if they started smoking as a teenager. Since there is no treatment that can restore lung function, the key method to prevent development of severe COPD is to identify smokers at an early stage of the disease so that they can be encouraged to stop smoking.⁶ Smoking cessation is the most important treatment for COPD.⁷ It is not feasible to screen the entire population of smokers for COPD at an early stage, at least not in areas where smoking is common.

By conducting this study we want to estimate the magnitude in our population. Furthermore, as COPD is a preventable and treatable entity we can develop awareness policy to screen smokers for COPD because accurate diagnosis in the initial phase of this disease would allow intervention to reduce further deterioration of pulmonary function.

In addition it would have a positive effect on the economic aspect of managing the disease.

MATERIAL AND METHODS

One hundred smokers working in Services Hospital/ SIMS (Doctors/paramedical staff.) both gender aged between 25 to 60 years having history of smoking > 5 years were included. Informed consent was taken from the subjects.

Test was performed as post-bronchodilator. Salbutamol inhaler with spacer device was used to carry out bronchodilation. The dose was 400 micrograms and was given after 15 minutes of the initial effort. Test was conducted by a single trained technician to avoid any bias. Patients were labeled as having COPD if FEV1/FVC <0.7 and severity of COPD was categorize as mild FEV1 >80%, moderate FEV1 80-50%, severe FEV1 30-15% and very severe if FEV1 <30% and ratio of FEV1/FVC is <0.70 in all the cases. All this information was assessed through a proforma attached herewith.

Data was analyzed by using SPSS computer (version 12.0). Age as quantitative variable was presented as mean and standard deviation. Gender, COPD and severity (mild, moderate, severe and very severe) was presented as frequency and percentage. Data was stratified for number of pack years (5-10), (11-20), (21-30), (31-40), (41-50), (51-60).

RESULTS

Majority of the patients were between 36-45 years old. Mean age of the patients was observe 47.8±6.1 years. Out of 100 cases, 93 (93.0%) were males while females were 7 (7.0%). Number of pack years 5-30 were most common. COPD was developed in 42 patients (42.0%). Out of these 42, severity of chronic obstructive pulmonary disease (COPD) as follows: mild 20 (47.7%), moderate 14 (33.3%), severe 7 (16.7%) and very severe 1 (2.3%). Out of these 42 patients with COPD, 39 (92.8%) were males and 3 (7.2%) were females.

Table-1: Age distribution

Age	Number	Percentage
25-35	22	22.0
36-45	29	29.0
46-55	30	30.0
56-60	19	19.0
Total	100	100.0
Mean±SD	47.8±6.1	

Table-2: Gender distribution

Gender	Number	Percentage
Male	93	93.0
Female	07	07.0
Total	100	100.0

Table-3: Distribution of cases by smoking status (number of pack years)

Number of pack years	Number	Percentage
5-10	38	38.0
11-20	34	34.0
21-30	10	10.0
31-40	08	08.0
41-50	06	06.0
51-60	04	04.0
Total	100	100.0

Table-4: Chronic obstructive pulmonary disease (COPD).

Number of pack years	COPD	
	Yes	No
5-10	8 (19.0%)	30 (51.7%)
11-20	6 (14.3%)	28 (48.3%)
21-30	10 (23.8%)	-
31-40	8 (19.0%)	-
41-50	6 (14.3%)	-
51-60	4 (9.6%)	-
Total	42	58

Table-5: Severity of chronic obstructive pulmonary

No. of pack/ years	Mild	Moderate	Severe	Very severe
5-10	8 (40%)	-	-	-
11-20	3 (15%)	3(21.4%)	-	-
21-30	6(30%)	3(21.4%)	1(14.3%)	-
31-40	2(10%)	5(35.7%)	1(14.3%)	-
41-50	-	2(14.3%)	4(57.1%)	-
51-60	1(5%)	1(7.2%)	1(14.3%)	1(100%)
Total	20	14	07	01

DISCUSSION

Chronic obstructive pulmonary disease (COPD) is predicted to become the third leading cause of death in the world by 2020. It is characterized by airflow limitation that is not fully reversible. The airflow limitation is usually progressive and associated with an abnormal inflammatory response of the lungs to noxious particles and gases, most commonly cigarette smoke. Among smokers with COPD, even following withdrawal of cigarette smoke, inflammation persists and lung function continues to deteriorate. One possible explanation is that bacterial colonization of smoke-damaged airways, most commonly with nontypeable *Haemophilus influenzae* (NTHi), perpetuates airway injury and inflammation. Furthermore, COPD has also been identified as an independent risk factor for lung cancer irrespective of concomitant cigarette smoke exposure. In this article, we review the role of NTHi in airway inflammation that may lead to COPD progression and lung cancer promotion.⁸

Smoking is a major cause of COPD and symptoms typically present in mid to later life.⁹ Smoking is a major risk factor of COPD and increases with aging due to changes in pulmonary function.¹⁰ A study conducted by Trofor has showed that smoking cessation as mandatory and beneficial in COPD.¹¹

The findings of this study showed higher frequency of COPD in smokers 42 (42.0%). Out of these 42 cases, 20 (47.7%) smokers had mild obstruction, 14 (33.3%) smokers had moderate obstruction and 7 (16.7%) smokers had severe obstruction.

Garcia-Aymerich et al (2007) and Godoy et al (2007) advocated high prevalence of COPD in smokers.^{12,13}

Khelafi et al demonstrated that tobacco smoking increases the prevalence of COPD which reaches 31.5% among smokers, 14.6% among the ex-smokers and 2.5% among non-smokers.¹⁴

In a study by Gingter COPD prevalence in smokers was 6.9%.¹⁵ A study conducted in Turkey showed 6.9% of the participants (general population) were found to have COPD with the prevalence of COPD was 18.1% in current smokers.¹⁶

A study in Japan showed overall, 22.5% of patients were current smokers.¹⁷ A study showed approximately one-quarter of smokers can be affected by clinically significant chronic obstructive pulmonary disease.¹¹

Present study has also showed a higher prevalence COPD of i.e. 42% in smokers. On contrary, in a study by Deveci et al (2011), prevalence of COPD was higher among current and former smokers (5.8%) than non-smokers (2.8%).¹⁸

Another study has showed the presence of COPD was significantly lower among women compared to men.¹⁹ These findings are also comparable with our results i.e. COPD was more prevalent in men. One in six who had a smoking history were found to have COPD and the majority were unaware of the diagnosis. Respiratory diagnoses were common. By spirometric evaluation many smokers are diagnosed with previously unknown COPD.²⁰

CONCLUSION

The higher prevalence of COPD in smokers clearly showed the effectiveness and a rationale to conduct screening in the most target group (smokers). But further studies with larger and more multi centric settings involving health economic models should be conducted in order to develop national recommended guidelines in future.

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