ORIGINAL RESEARCH

Assessment of Determinants of Chronic Obstructive Pulmonary Disease

Dr. Nitin Rathi

Associate Professor, Department of TB & Chest, Santosh Medical College, Ghaziabad, U.P

Corresponding Author
Dr. Nitin Rathi
Associate Professor, Department of TB & Chest, Santosh Medical College, Ghaziabad, U.P

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ABSTRACT

Background: Globally, both men and women suffer from chronic obstructive pulmonary disease (COPD), a chronic lung condition that can be prevented and treated. The present study was conducted to assess determinants of chronic obstructive pulmonary disease.

Materials & Methods:110 patients suspected of COPD of both genders were selected. Spirometry was performed using a Spirolab spirometer.

Results: Out of 110 patients, 67 were males and 43 were females. Clinical features among COPD and non- COPD patients were chronic cough in 56% and 41%, chronic phlegm in 45% and 10%, wheezing episodes in past 12 months in 25% and 26%, shortness of breath in 81% and 62%, exacerbation in 43% and 30% and comorbidities among 54% and 50% respectively. The difference was significant (P< 0.05). Among COPD patients, 28 were in GOLD 1, 22 in GOLD 2, 6 in GOLD 3 and 4 in GOLD 4. 15 were non- smokers. Current smokers were 8, 13, 4 and 3 and ex- smokers were 5, 9, 2 and 3 having GOLD 1, GOLD 2, GOLD 3 and GOLD 4 respectively. Biomass index >100 were 14, 8, 3 and 1 having GOLD 1, GOLD 2, GOLD 3 and GOLD 4 respectively. The mean pack years was 15.2 years, 32.5 years, 35.8 years and 42.3 years having GOLD 1, GOLD 2, GOLD 3 and GOLD 4 respectively. The difference was significant (P< 0.05).

Conclusion: Given that smoking is a major risk factor for developing COPD, there may be a rise in behavior modification and smoking cessation education at urban periphery healthcare facilities.

Keywords: chronic obstructive pulmonary disease, GOLD, Smoker

Introduction

Globally, both men and women suffer from chronic obstructive pulmonary disease (COPD), a chronic lung condition that can be prevented and treated. With 3.23 million fatalities in 2019, it ranks as the third most common cause of death globally.[1] People under the age of 70 account for 90% of COPD fatalities in low- and middle-income nations. According to the 2019 worldwide Burden of Disease study report, 62.6% of the worldwide burden of lung cancer and COPD occurs in low- and middle-income nations.[2]

Over the next 40 years, it is anticipated that the prevalence of COPD would increase due to the rising smoking rates in emerging nations and the aging of the population in developed countries. COPD and related illnesses may be the cause of over 5.4 million deaths by 2060.[3]The prevalence of COPD in India varies from 6.5% to 7.7% in rural areas and from 9.9% in urban areas.According to the World Health Organization (WHO), between 4 and 20% of Indian adults have COPD. COPD is the second leading cause of death in India as of 2016.

Since they treat the majority of patients in the early stages, primary healthcare providers play a crucial role in both diagnosing and treating COPD.[4]Sadly, in clinical practice, COPD is frequently misdiagnosed and underassessed. Due to the limited availability of spirometry assessments of lung functions, it is frequently difficult to understand the severity of the disease and the beginning of respiratory impairment.[5]The present study was conducted to assess determinants of chronic obstructive pulmonary disease.

Materials & Methods

The study was carried out on 110 patients suspected of COPD of both genders. All gave their written consent to participate in the study. The diagnosis of COPD and its severity was determined according to the Global initiative for chronic obstructive lung disease (GOLD) guidelines.

Data such as name, age, gender etc. was recorded. Spirometry was performed using a Spirolab spirometer. Postbronchodilator spirometry, which is carried out 15 minutes after the administration of two doses of salbutamol sulfate (200 µg per dose), was

used to confirm the diagnosis of COPD. Participants were instructed not to take their bronchodilator six to twenty-four hours prior to the test. For every lung function variable, at least three best measurements were taken; the best measurement was chosen for further examination.Results thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

Results

Table: I Distribution of patients

Total- 110		
Gender	**Male**	**Female**
Number	67	43

Table I shows that out of 110 patients, 67 were males and 43 were females.

Table: II Assessment of parameters

Clinical features	COPD (60)	No COPD (50)	P value
Chronic cough	56%	41%	0.81
Chronic phlegm	45%	10%	
Wheezing episodes in past 12 months	25%	26%	
Shortness of breath	81%	62%	
Exacerbation	43%	30%	
comorbidities	54%	50%	

Table II, graph I shows that clinical features among COPD and non- COPD patients were chronic cough in 56%and 41%, chronic phlegm in 45% and 10%, wheezing episodes in past 12 months in 25% and 26%, shortness of breath in 81% and 62%, exacerbation in 43% and 30% and comorbidities among 54% and 50% respectively. The difference was significant (P< 0.05).

Graph: I Assessment of parameters

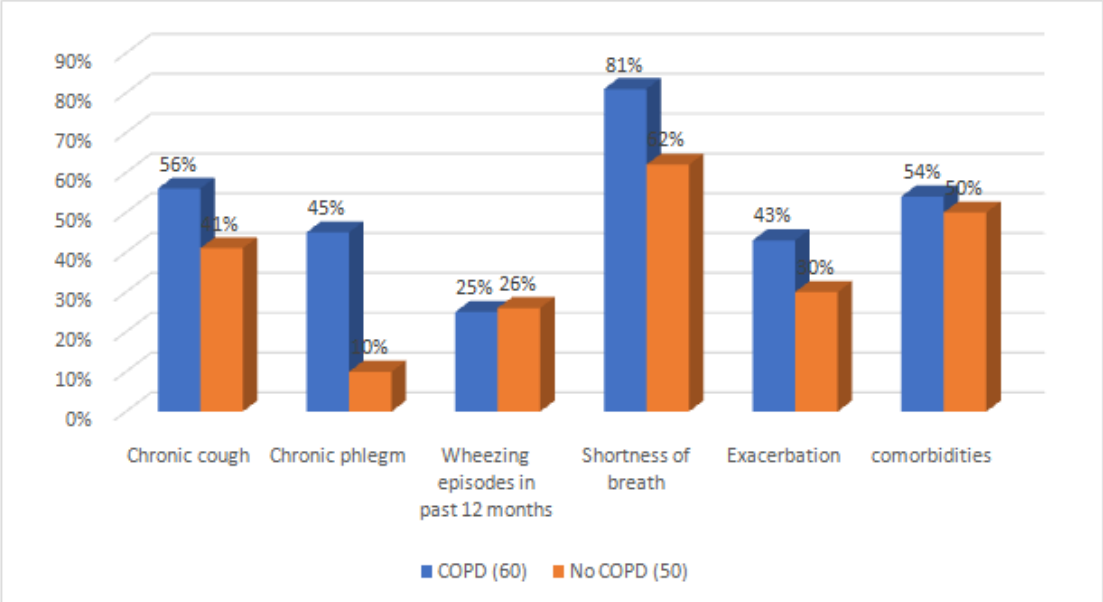

Table: III Distribution of smoking status and COPD GOLD classification

Parameters	Variables	GOLD 1 (28)	GOLD 2 (22)	GOLD 3 (6)	GOLD 4 (4)	P value
Smoking pattern	Never smoker	15	0	0	0	0.04
	Currentsmoker	8	13	4	3	
	Ex-smoker	5	9	2	3	
Biomass Index	<50	10	7	1	1	0.02
	50–100	4	7	2	2	
	>100	14	8	3	1	
Mean pack years		15.2	32.5	35.8	42.3	0.05

Table III shows that among COPD patients, 28 were in GOLD 1, 22 in GOLD 2, 6 in GOLD 3 and 4 in GOLD 4. 15 were non- smokers. Current smokers were 8, 13, 4 and 3 and ex- smokers were 5, 9, 2 and 3 having GOLD 1, GOLD 2, GOLD 3 and GOLD 4 respectively. Biomass index >100 were 14, 8, 3 and 1 having GOLD 1, GOLD 2, GOLD 3 and GOLD 4 respectively. The mean pack years was 15.2 years, 32.5 years, 35.8 years and 42.3 years having GOLD 1, GOLD 2, GOLD 3 and GOLD 4 respectively.The difference was significant (P< 0.05).

Discussion

Given that India is a big nation with a diversified population with a range of sociodemographic characteristics and cultural customs, the risk factors are probably going to vary by location.[6] The main risk factor for COPD is tobacco use, particularly second-hand smoke. In addition, repeated childhood infections, chemicals, occupational dust, and indoor air pollution from burning biomass fuel for heating and cooking are significant risk factors for the condition.[7] According to the National Family Health Survey-5 (NFHS-5), only 59% of Indian households cook with clean fuel; in rural regions, this percentage is 43.2%, whereas in urban areas, it is 89.7%. In rural areas, 10.5% of women smoke, whereas in metropolitan areas, the rate is 5.5%. In a similar vein, 42.7% of men in rural and urban region.[8]The present study was conducted to assess determinants of chronic obstructive pulmonary disease.

We found that out of 110 patients, 67 were males and 43 were females.Soniet al[9] in their study total113 patients [median age, 59 y (interquartile range [IQR] 50-66); [82 (72.6% men and 31(27.4%) women]) were included in study. Severity of COPD was not linearly correlatedwith the severity of risk factors like male sex (p=0.99), advancing age (p=0.70), smoking(p=0.78) and indoor air pollution (p=0.82). Low BMI (Body mass index) (18.1 Vs 20.1 Kg/m2, p<0.01) was associated with severity of COPD. Women tended to spend more timein house (p<0.01) and Indoor risk time product grade was significantly higher in females(grade 4 indoor risk time product 30.9 vs 13.2, p=0.01). The CCQ score had an inverserelationship with baseline FEV1 (Forced expiratory volume in one second) [Pearsoncoefficient -0.33 (p=0.003)]. There was moderately strong relationship between decline inFEV1 and decline in PEFR (peak expiratory flow rate) (r=0.66).

We observed that clinical features among COPD and non- COPD patients were chronic cough in 56% and 41%, chronic phlegm in 45% and 10%, wheezing episodes in past 12 months in 25% and 26%, shortness of breath in 81% and 62%, exacerbation in 43% and 30% and comorbidities among 54% and 50% respectively. Sinhaet al[10] found that the prevalence of COPD was 10.1% (95% confidence interval [CI] 8.5, 11.9%). Tobacco smoking was the strongest risk factor associated (aOR 9.48; 95% CI 4.22, 14.13) followed by environmental tobacco smoke (ETS), occupational exposure, age, and biomass fuel. Each pack-year of smoking increased 15% risk of COPD. Ex-smokers had 63% lesser risk compared to current smokers. Clinical allergy seems to preclude COPD (aOR 0.06; 95% CI 0.02, 0.37). ROC analysis showed 94.38% of the COPD variability can be assessed by this model (sensitivity 57.4%; positive predictive value 93.3%). Only 48% patients were on treatment. Treatment continuation was impeded by its cost.

We found that among COPD patients, 28 were in GOLD 1, 22 in GOLD 2, 6 in GOLD 3 and 4 in GOLD 4. 15 were non- smokers. Current smokers were 8, 13, 4 and 3 and ex- smokers were 5, 9, 2 and 3 having GOLD 1, GOLD 2, GOLD 3 and GOLD 4 respectively. Biomass index >100 were 14, 8, 3 and 1 having GOLD 1, GOLD 2, GOLD 3 and GOLD 4 respectively. The mean pack years was 15.2 years, 32.5 years, 35.8 years and 42.3 years having GOLD 1, GOLD 2, GOLD 3 and GOLD 4 respectively. Orozco-Levi M et al[11]designed as a case-control study of 120 females requiring hospitalisation during 2001-2003. Cases were recruited from hospital records as females who had been admitted for an exacerbation of COPD. Controls were obtained from pulmonary function test laboratory consultations prior to a surgical intervention. All patients answered a standardised questionnaire. Exposure to wood or charcoal smoke was strongly associated with COPD after adjusting for age and smoking. The association between length of exposure and COPD suggested a dose-response pattern. Intensity of exposure in both summer and winter was also related to COPD. Wood or charcoal alone independently increased risk of COPD (odds ratio (OR) 1.8 and 1.5, respectively), but only the combination of both was statistically significant (OR 4.5).

The shortcoming of the study is small sample size.

Conclusion

Authors found that given that smoking is a major risk factor for developing COPD, there may be a rise in behavior modification and smoking cessation education at urban periphery healthcare facilities.

References

1. Bhandari R, Sharma R. Epidemiology of chronic obstructive pulmonary disease: A descriptive study in the mid-western region of Nepal. Int J Chron Obstruct Pulmon Dis 2012:7:253–257.
2. Zha Z, Leng R, Xu W, et al. Prevalence and risk factors of chronic obstructive pulmonary disease in Anhui Province, China: A population-based survey. BMC Pulm Med 2019;19(1):102.
3. Mahesh PA, Jayaraj BS, Prabhakar AK, et al. Identification of a threshold for biomass exposure index for chronic bronchitis in rural women of Mysore district, Karnataka, India. Indian J Med Res 2013;137(1):87–94.
4. Aggarwal N, Deswal BS, Ray S, et al. An epidemiological study of chronic obstructive

pulmonary disease among 35 years and above rural population of Gurugram Haryana. Int J Community Med Public Health 2019;6(5):2206–2210.
5. Mrinmoy M, Santanu G, Kaushik S, et al. A study of correlation between body mass index and GOLD staging of chronic obstructive pulmonary disease patients. Journal of Association of Chest Physicians 2013;1(2):58–61.
6. Pandolfi P, Zanasi A, Musti MA, et al. Socio-economic and clinical factors as predictors of disease evolution and acute events in COPD Patients. PLoS One 2015;10(8):e0135116.
7. Soni NA, Jain AP. Risk factors for chronic obstructive airway disease: A hospital based prospective study in rural central India. Ann Med Health Sci Res 2019;9:484–489. Print ISSN: 2141-9248; Online ISSN: 2277-9205. 30. Mejza F, Gnatiuc L, Buist AS, et al. Prevalence and burden of chronic bronchitis symptoms: Results from the BOLD study. EurRespir J 2017;50(5):1700621.
8. Kotz D, Wesseling G, Huibers MJ, et al. Efficacy of confrontational counseling for smoking cessation in smokers with previously undiagnosed mild to moderate airflow limitation: Study protocol of a randomized controlled trial. BMC Public Health 2007;7:332.
9. Soni NA, Jain AP. Risk factors for chronic obstructive airway disease: A hospital based prospective study in rural central India. Ann Med Health Sci Res 2019;9:484–489.
10. Sinha B, Singla R, Chowdhury R. An epidemiological profile of chronic obstructive pulmonary disease: A community-based study in Delhi. J Postgrad Med 2017;63(1):29–35.
11. Orozco-Levi M, Garcia-Aymerich J, Villar J, Ramirez-Sarmiento A, Anto J, Gea J. Wood smoke exposure and risk of chronic obstructive pulmonary disease. European Respiratory Journal. 2006;27:542-546.
12. Singh HP, Yadav M, Nayar A, Verma C, Aggarwal P, Bains SK. Ameloblastomatous calcifying ghost cell odontogenic cyst - a rare variant of a rare entity. Ann Stomatol (Roma). 2013 Mar 20;4(1):156-60. doi: 10.11138/ads.0156.
13. Singh HP, Kumar P, Goel R, Kumar A. Sex hormones in head and neck cancer: Current knowledge and perspectives. Clin Cancer Investig J. 2012;1(1):2-5. https://doi.org/10.4103/2278-0513.95011.
14. Sharma A, Singh HP, Gupta AA, Garg P, Moon NJ, Chavan R. Granulocytic sarcoma in non-leukaemic child involving maxillary sinus with long term follow up: A rare case report. Ann MaxillofacSurg 2014;4:90-5.
15. Puri N, Rathore A, Dharmdeep G, Vairagare S, Prasad BR, Priyadarshini R, et al. A clinical study on comparative evaluation of the effectiveness of carbamazepine and combination of carbamazepine with baclofen or capsaicin in the management of Trigeminal Neuralgia. Niger J Surg 2018;24:95-9.
16. Singh HP, Yadav M, Nayar A, Verma C, Aggarwal P, Bains SK. Ameloblastomatous calcifying ghost cell odontogenic cyst - a rare variant of a rare entity. Annali di Stomatologia 2013; IV (1): 156-160