Original Research

PREVALENCE AND DETERMINANTS OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD) IN HIGH- RISK PATIENTS IN INDIA

Dr. Gautam Singh[1*], Dr. Ashutosh Chaturvedi[2], Dr. Manish Kumar[3], Dr. Uday Prabhakar[4]

[1*]Assistant Professor, Department of Internal Medicine, Command Hospital Lucknow, Uttar Pradesh.
[2]Assistant Professor, Department of Internal Medicine, Command Hospital Lucknow, Uttar Pradesh.
[3]Assistant Professor, Department of Anesthesiology & Critical care, Command hospital, Lucknow, Uttar Pradesh.
[4]Assistant Professor, Department of Medicine, Government Medical College Azamgarh, Uttar Pradesh.
Corresponding Author: Dr. Gautam Singh
Assistant Professor, Department of Internal Medicine, Command Hospital Lucknow, Uttar Pradesh.
Email: majorgautamsingh@yahoo.com

ABSTRACT

Background/Objective: Smoking is considered to be a high risk for COPD. In this study we made an attempt to assess prevalence and correlates of COPD in a high-risk population.

Material and Method: A total of 200 smokers (having history of ≥100 cigarette/bidi use) aged 18 years or above were enrolled after excluding patients with myocardial disease, unstable cardiovascular status or pulmonary embolus, thoracic, abdominal, or cerebral aneurysms, eye surgery, acute disease affecting pulmonary functions or recent surgery of thorax/abdomen. Smoking history of patients was obtained and noted in terms of pack years, symptoms (cough, sputum, dyspnea, wheeze) were noted. All the patients underwent pulmonary function test assessment using spirometry. Diagnosis and staging of COPD was done using GOLD criteria. Independent samples't'- and Chi-square tests were used to compare the data.

Results: Mean age of patients was 52.11±13.90 years. All were males. Mean BMI was 23.52±3.05 kg/m^2. Mean smoking pack years was 14.51±8.87. A total of 57 (28.5%) were symptomatic. Cough (28.5%), sputum (22.5%) and dyspnoea (21%) were the most common symptoms. Prevalence of COPD was 34%. Stagewise, 8 (4%), 55 (27.5%) and 5 (2.5%) were Stage I, II and III patients. COPD was significantly associated with older age, higher pack years and symptomatic status ($p<0.001$). However, 17.6% of COPD patients were asymptomatic too.

Conclusion: More than one-third of smokers had COPD. Older age, higher pack years and symptomatic state were significantly associated with COPD.

Keywords: High Risk, Smokers, Pack Years, Chronic Obstructive Pulmonary Disease (COPD), Symptomatic.

INTRODUCTION

Chronic obstructive pulmonary disease (COPD) is a major global health concern, characterized by persistent respiratory symptoms and airflow limitation due to airway and alveolar abnormalities, primarily caused by significant exposure to noxious particles or gases[1]. Smoking is the predominant risk factor, accounting for approximately 85–90% of COPD cases, as cigarette smoke induces chronic inflammation and structural damage in the airways and lung parenchyma[2,3].

www.ajmrhs.com
eISSN: 2583-7761
Date of Received: 12-04-2026
Date Acceptance: 19-04-2026
Date of Publication: 18-05-2026

Smokers are at significantly higher risk of developing COPD compared to non-smokers, with the risk increasing proportionally with the intensity and duration of smoking[2,3].

Early detection of COPD in smokers is crucial as symptoms like chronic cough and dyspnea often appear late in the disease progression, by which time significant lung damage has already occurred[4]. Pulmonary function tests, especially spirometry, remain the gold standard for diagnosing COPD, with a post-bronchodilator FEV1/FVC ratio <0.70 confirming the presence of persistent airflow limitation[5]. Screening smokers for COPD can facilitate early intervention, including smoking cessation, pharmacological treatments, and pulmonary rehabilitation, which collectively improve quality of life and slow disease progression. Screening programs targeting at-risk populations, particularly smokers are essential for identifying

undiagnosed cases. Early diagnosis and intervention not only reduce morbidity but also alleviate the substantial healthcare burden associated with advanced COPD. Hence, the present study was carried out to assess the prevalence of COPD in high-risk smoking population using spirometry.

MATERIAL AND METHODS

The present study was carried out at a Services hospital in Eastern India after getting approval from Institutional Ethics Committee and getting informed consent from the participants. A total of 200 high risk patients including current/ex-smokers with smoking history of >100 cigarettes or bidi during life time were enrolled in the study after excluding patients with recent myocardial infarction or pulmonary embolus (<one month old), hemoptysis of known origin, pneumothorax, unstable cardiovascular status, thoracic, abdominal or cerebral aneurysms, recent history of eye surgery, presence of an acute disease process that might interfere with spirometry and those who underwent any recent surgery of thorax or abdomen. At enrolment details like age and sex were noted. Patients were enquired about their smoking history and the number of pack years were calculated by multiplying average number of cigarettes/bidis consumed and years of their use.

All the patients underwent spirometry forced expiratory volume in one minute (FEV_1) and forced vital capacity (FVC) were assessed before and after bronchodilator. Post-bronchodilator FVC/FEV_1 ratio <0.7 was considered as indicator of COPD. % Predicted FEV_1 values ≥80%, 50-79%, 30-49% and <30% were considered as stage I (mild), stage II (moderate), stage III (severe) and stage IV (very severe) COPD[5].

Data Analysis: Data was analyzed using SPSS 25.0 software. Chi-square and Independent samples't'-tests were used to compare the data. 'p' value less than 0.05 was considered as statistically significant.

RESULTS

Age of screened patients ranged from 19 to 86 years. Mean age of patients was 52.11±13.90 years. All the patients were males (100%). Majority of patients had BMI in 18.4-24.9 kg/m^2 range (62.5%) followed by those having BMI 25.0-29.9 kg/m^2 (31%), <18.5 kg/m^2 (4.5%) and ≥30 kg/m^2 (2%) respectively. Mean BMI of patients was 23.52±3.05 kg/m^2. Majority of patients (52%) had smoking history of 6-10 pack years followed by those having smoking history of 11-20 pack years (30.5%), >30 pack years (9%), 21-30 pack years (7.5%) and ≤5 pack years (1%) respectively. Mean smoking history was recorded as 14.51±8.87 pack years. There were 57 (28.5%) symptomatic patients. All the symptomatic patients presented with cough (28.5%). Other symptoms included sputum (22.5%), dyspnea (21%) and wheezing (13.5%) respectively (Table 1).

Table 1: General Characteristics and Profile of the High-Risk Patients (n=200)

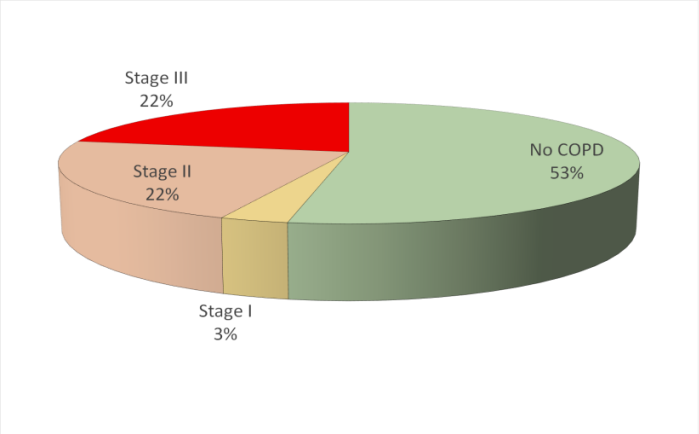
SN	Characteristic	Statistic
1.	Mean age ± SD (Range) in years	52.11±13.90 (19-86)
2.	Sex Male	200 (100%)
3.	Body mass index (BMI) <18.5 kg/m^2 18.5-24.9 kg/m^2 25.0-29.9 kg/m^2 ≥30 kg/m^2 Mean BMI±SD (kg/m^2)	9 (4.5%) 125 (62.5%) 62 (31.0%) 4 (2.0%) 23.52±3.05
4.	Smoking Pack years ≤5 6-10 11-20 21-30 >30 Mean Smoking Pack years±SD	2 (1.0%) 104 (52.0%) 61 (30.5%) 15 (7.5%) 18 (9.0%) 14.51±8.87
5.	Symptomatic	57 (28.5%)
6.	Major symptoms Cough Sputum Dyspnoea Wheeze	57 (28.5%) 45 (22.5%) 42 (21.0%) 27 (13.5%)

On spirometry, a total of 68 (34%) patients were recognized to have COPD. Prevalence of Stage I, II and III COPD was 4%, 27.5% and 2.5% respectively. None of the patients had stage IV COPD (Table 2).

Table 2: Distribution of Cases According to COPD Status and Stage

SN	Status	No.	%
1.	No COPD	132	66.0
2.	COPD	68	34.0
	Stage I (Mild)	8	4.0
	Stage II (Moderate)	55	27.5
	Stage III (Severe)	5	2.5
	Stage IV (Very Severe)	0	0.0

Fig. 1: Distribution of Study Population According to COPD Status

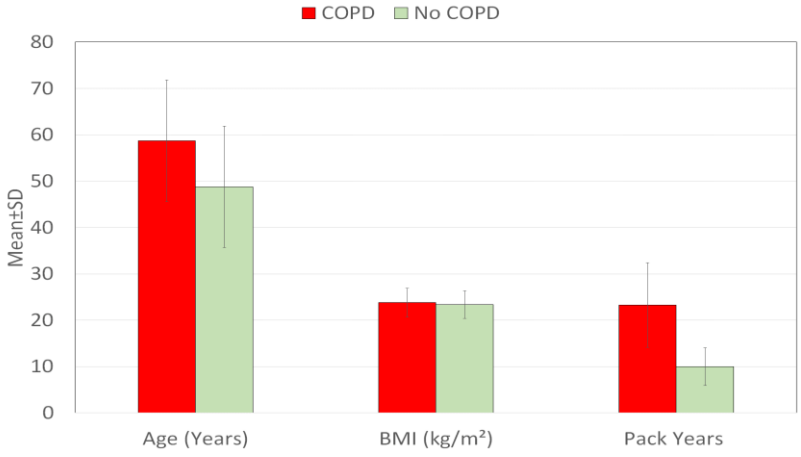


High risk patients with COPD as compared to those without COPD had a significantly higher mean age ($p<0.001$) and larger mean pack years ($p<0.001$). There was no significant difference between two groups for body mass index ($p=0.381$). Majority of patients with COPD (82.4%) as compared to only 1 (0.8%) patient without COPD were symptomatic ($p<0.001$). A significant association of cough, sputum, dyspnea and wheezing was also seen with COPD diagnosis ($p<0.001$) (Table 3).

Table 3: Association of Demographic and Clinical Factors with COPD Prevalence in High-Risk Patients

SN	Characteristic	COPD (N=68)	No COPD (N=132)	'P' Value
1.	Mean age±SD (years)	58.59±13.12	48.77±13.13	<0.001
2.	Mean BMI±SD (kg/m^2)	23.79±3.14	23.39±3.00	0.381
3.	Mean pack years±SD	23.26±9.15	10.00±4.06	<0.001
4.	Symptomatic	56 (82.4%)	1 (0.8%)	<0.001
5.	Cough	56 (82.4%)	1 (0.8%)	<0.001
6.	Sputum	45 (66.2%)	0	<0.001
7.	Dyspnoea	42 (51.8%)	0	<0.001
8.	Wheeze	27 (39.7%)	0	<0.001

Fig. 2: Comparison of Age, BMI and Smoking Pack Years between Two Groups



DISCUSSION

The present study showed that nearly one-third (34%) high risk patients had COPD. Interestingly most of the COPD patients (60/68; 88.2%) already have moderate to severe COPD. Moreover, most of the COPD patients (82.4%) were symptomatic too. The findings thus reflect that despite recognition of smoking as a high risk factor for COPD, the diagnosis of COPD was made at advancing stages and that too in patients with high prevalence of symptomatic manifestation.

The finding of the present study is in close proximity with the observations of Mycroft *et al.*[6] who in their study among hospitalized smokers reported the prevalence of COPD to be 34%. However, in their study 89% of patients had mild-to-moderate airway obstruction as compared to a dominance of those with moderate-to-severe obstruction in the present study. It may be noted that our patients were not hospitalized patients only but included OPD patients and attendants of patients with smoking habit as per inclusion criteria of the study. Moreover, our patients were practically free of any systemic or acute illness increasing the risk of COPD. Furthermore, all the patients in the present study were newly diagnosed cases of COPD as compared to 28% newly diagnosed cases in their study. In view of these differences, the problem of COPD in our patients was more pronounced as well as was of more severe type. It may also be noted that in our study, a large proportion of patients diagnosed with COPD were symptomatic too. These findings imply lack of awareness as well as a careless attitude of patients towards their problem.

It may be assumed that smokers in early stages of disease with only mild airflow limitation in the state of few symptoms characteristically ignore their symptoms owing to lesser knowledge about COPD. Symptomatic manifestation in terms of cough, wheezing, dyspnea and sputum is often perceived as a routine result of smoking. Such patients often also ignore their declining exercise tolerance in general population[7]. Our patients, despite having a services background was no different from this general population as most of the patients who were symptomatic and who were diagnosed for COPD were in advancing age where they have adopted a sedentary lifestyle and ignored the exercise tolerance too. Consecutively, age emerged as a significant risk factor associated with COPD in our study. Older age is an established risk factor associated with COPD, independent of smoking status[8,9]. In the present study, among smokers too, the association of age with COPD remained unchanged.

We also found a significant association between pack years and COPD prevalence. There is consistent evidence showing a direct relationship between number of pack years smoked and COPD prevalence[10, 11].

In the present study, we did not notice a significant association between BMI and COPD. As far as association of COPD with BMI is concerned, there is mixed evidence showing association of both low as well as high BMI with COPD[12-16]. In this changing paradigm the relationship between BMI and COPD seems to vary as also seen in the present study.

In general, the present study showed the need to screen smokers, especially those presenting with symptoms in order to facilitate early recognition and treatment of COPD. These findings are in consistence with some other larger studies that highlight the significance of spirometry for screening in symptomatic smokers[7,17]. Further studies on larger sample size with a variable profile of patients and inclusion of more variables like comorbidities, physical activity status and other risk factors are recommended. Attempts to make such assessments in female smokers should also be made in view of the limitation of present study in male subjects only.

CONCLUSION

There was a high prevalence of COPD (34%) in high-risk smoking population. Advancing age, longer duration/frequency of smoking and symptomatic manifestations were the risk factors associated with COPD in smokers.

Acknowledgement- None
Financial support and sponsorship- None
Conflict of interest- None

REFERENCES

1. Singh D, Agusti A, Anzueto A, Barnes PJ, Bourbeau J, Celli BR, *et al.*. Global Strategy for the Diagnosis, Management, and Prevention of Chronic Obstructive Lung Disease: the GOLD science committee report 2019. Eur Respir J. 2019;53(5).
2. Kotlyarov S. The Role of Smoking in the Mechanisms of Development of Chronic Obstructive Pulmonary Disease and Atherosclerosis. Int J Mol Sci. 2023 May 13;24(10):8725.
3. Chung C, Lee KN, Han K, Shin DW, Lee SW. Effect of smoking on the development of chronic obstructive pulmonary disease in young individuals: a nationwide cohort study. Front Med (Lausanne). 2023; 10:1190885.
4. Lin CH, Cheng SL, Chen CZ, Chen CH, Lin SH, Wang HC. Current Progress of COPD Early Detection: Key Points and Novel Strategies. Int J Chron Obstruct Pulmon Dis. 2023; 18:1511-1524.
5. Agustí A, Celli BR, Criner GJ, Halpin D, Anzueto A, Barnes P, et al. Global Initiative for Chronic Obstructive Lung Disease 2023 Report: GOLD Executive Summary. Eur Respir J. 2023;61(4):2300239.

6. Mycroft K, Korczynski P, Jankowski P, Kutka M, Zelazna O, Zagaja M, *et al*. Active screening for COPD among hospitalized smokers - a feasibility study. Ther Adv Chronic Dis. 2020; 11:2040622320971111.
7. Kaplan A, Thomas M. Screening for COPD: the gap between logic and evidence. Eur Respir Rev. 2017;26(143):160113.
8. Kukrety SP, Parekh JD, Bailey KL. Chronic obstructive pulmonary disease and the hallmarks of aging. Lung India. 2018; 35(4):321-327.
9. Morena D, Izquierdo JL, Rodríguez J, Cuesta J, Benavent M, Perralejo A, Rodríguez JM. The Clinical Profile of Patients with COPD Is Conditioned by Age. J Clin Med. 2023; 12(24):7595.
10. Rey-Brandariz J, Pérez-Ríos M, Ahluwalia JS, Beheshtian K, Fernández-Villar A, Represas-Represas C, et al. Tobacco Patterns and Risk of Chronic Obstructive Pulmonary Disease: Results from a Cross-Sectional Study. Arch Bronconeumol. 2023; 59(11):717-724.
11. Chung C, Lee KN, Han K, Shin DW, Lee SW. Effect of smoking on the development of chronic obstructive pulmonary disease in young individuals: a nationwide cohort study. Front Med (Lausanne). 2023; 10:1190885.
12. Wu Z, Yang D, Ge Z, Yan M, Wu N, Liu Y. Body mass index of patients with chronic obstructive pulmonary disease is associated with pulmonary function and exacerbations: retrospective real-world research. J Thorac Dis. 2018;10(8):5086-5099.
13. De S. Body mass index among patient with chronic obstructive pulmonary diseases. Indian J Physiol Pharmacol. 2012; 56(4):353-8.
14. Rossaki FM, Hurst JR, van Gemert F, Kirenga BJ, Williams S, Khoo EM, et al. Strategies for the prevention, diagnosis and treatment of COPD in low- and middle-income countries: the importance of primary care. Expert Rev Respir Med. 2021; 15(12):1563-1577.
15. Wouters E. Obesity and metabolic abnormalities in chronic obstructive pulmonary disease. Ann Am Thorac Soc. 2017; 14(Supplement_5):S389–S394.
16. Huang L, Luo FM. Research progress on the relationship between obesity and pulmonary function in chronic obstructive pulmonary disease. Chin J Tuber Respir Med. 2019; 2019(11):862–864.
17. Wisnivesky J, Skloot G, Rundle A, Revenson TA, Neugut A. Spirometry screening for airway obstruction in asymptomatic smokers. Aust Fam Physician. 2014 Jul; 43(7):463-7.

How to cite this article: Dr. Gautam Singh, Dr. Ashutosh Chaturvedi, Dr. Manish Kumar, Dr. Uday Prabhakar, PREVALENCE AND DETERMINANTS OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD) IN HIGH- RISK PATIENTS IN INDIA, Asian J. Med. Res. Health Sci., 2026; 4 (2):303-307.
Source of Support: Nil, Conflicts of Interest: None declared.