



STUDY OF SOCIODEMOGRAPHIC AND CLINICAL PROFILE OF SMOKER AND NON-SMOKER COPD PATIENTS ATTENDING A TERTIARY CARE CENTRE IN NORTH INDIA

Pulmonary Medicine

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ABSTRACT

COPD is the third leading cause of death worldwide and the second leading cause of death in India. There are so many factors that contribute to the development of COPD and determine its progression and severity. This study was done to know the Sociodemographic and clinical profiles of smoker and non-smoker COPD patients attending a tertiary care centre in North India. **Material and Method:** This was a hospital-based prospective and observational study conducted in the Department of TB and Respiratory Diseases, S.N. Medical College, Agra. Patients were recruited for the study based on GOLD criteria (Post Bronchodilator FEV1/FVC < 0.7). Patients were evaluated based on demographic characteristics and clinical features. **Results:** Among the total eligible patient's prevalence of smoker COPD patients was 62.96% and the prevalence of non-smoker patients was 37.04%. Among the eligible 108 cohort patients, 70 (64.81%) were males and 38 (35.18%) were females. Female patients were higher in the non-smoker group (75%). The higher number of patients enrolled were from a rural background (60.18%). Mean age of the population was 48.8 years with a majority of patients lying in the younger age group and were malnourished (BMI < 18.5). Breathlessness was the most common symptom reported (49%) and smoker COPD patients were having severe dyspnoea (46.29%). **Conclusion:** 37.04% prevalence of non-smoker COPD was noted. Early detection with the help of spirometry will be helpful in not only modifying the disease course but also delaying and preventing fatal complications. Hence, patients may be treated earliest by various measures like lifestyle modification, smoking cessation, etc.

KEYWORDS

Copd, Smoker, Non-smoker, Sociodemographic Profile

INTRODUCTION:

Chronic Obstructive Pulmonary Disease (COPD) imposes major health and socioeconomic burden globally and COPD is the third most common cause of death worldwide.¹ According to the global burden of disease (GBD) report, chronic obstructive pulmonary disease (COPD) is the 2nd leading cause of death and DALYs in India.² The prevalence of COPD is substantial and increasing. COPD prevalence, morbidity and mortality differs across countries and different part of the world and largely depends upon the exposure to various risk factors mainly smoking, indoor air pollution, occupational exposure to noxious stimuli and poor socioeconomic status. As a result of urbanization, socioeconomic development, industrialization, changing lifestyles and increasing age leading to an increase in non-communicable diseases in India. COPD is mostly caused by cigarette smoke in developed countries but in underdeveloped nations indoor and outdoor air pollution causes a significant number of cases. With the emergence of household air pollution and smoking as two of the top three risk factors responsible for the majority of DALYs lost due to respiratory diseases. Jindal et al performed a systematic review on COPD prevalence in India from 1964 to 1995³ and showed that prevalence varies between different parts of India the highest being reported in the North Indian rural population (9.4%).

There is a high prevalence of COPD in the North Indian population as high as 19% in some states⁴. Most patients with COPD complain of breathlessness and Cough with expectoration as their chief presenting complaints and they are referred to higher centres for these complaints from primary centres. India is having the highest burden of tuberculosis and so are the post-tuberculosis patients. In post TB sequelae obstructive changes are seen in spirometry and this is the important cause of COPD in females after biomass fuel smoke exposure and tobacco smoke. This study was done to know the sociodemographic profile and clinical profile of COPD patients attending tertiary care centres situated in North India and they were compared based on smoking history.

AIM AND OBJECTIVE:

AIM:

Study of Sociodemographic and clinical profile of smoker and non-smoker COPD patients attending a tertiary care centre in North India

OBJECTIVE:

1. To assess the prevalence of smoker and non-smoker COPD patients among different sexes in this region
2. To assess various risk factors responsible for the development of COPD in this region
3. To study various clinical features present in COPD patients and their distribution in smokers and non-smokers COPD patients

MATERIAL AND METHOD:

This was a hospital-based prospective and observational study conducted in the Department of TB and Respiratory Diseases, S.N. Medical College, Agra. The study was carried out from September 2019 to July 2021. Patients were recruited for the study based on GOLD criteria (Post Bronchodilator FEV1/FVC < 0.7).

Patients were evaluated based on demographic characteristics and clinical features. History About Various Risk Factors Like Smoking, Biomass Fuel Exposure, Occupation and Past History of Tuberculosis and History of Childhood Recurrent Infections were taken into consideration. Demographic Data included Age, Sex, Height, Weight, Occupation and Compared. Clinical features included Cough, Expectoration, Dyspnoea, Chest Pain And compared.

Inclusion Criteria:

- Persons who could provide written informed consent.
- Patients of age 18 years or older have confirmed COPD based on gold criteria.

Exclusion criteria:

- Those who did not give consent to participate in the study.
- Patients with significant comorbidity like heart failure, CLD, and CKD were excluded
- Patients with communicable lung diseases like active pulmonary tuberculosis
- Patients who were immunocompromised

STATISTICAL ANALYSIS OF DATA

For the comparison of categorical variables, significance testing was done by χ^2 and if needed then a 2-sided Fisher exact test was applied. Descriptive statistics were used to describe the qualitative and quantitative data. $P < 0.05$ were considered significant. Analysis was performed using suitable software.

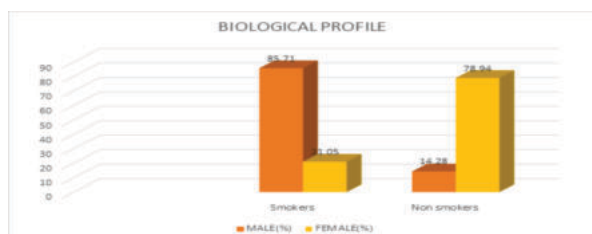
OBSERVATION AND RESULT

A Total Of 108 COPD Patients were enrolled in the study and they were divided into two groups- Smokers (N=68) and Non-Smokers (N=40). Total smoker patients (62.96%) were higher than non-smokers (37.04%) in the total COPD Patients. Overall male patients were higher than female patients but female patients were higher in the non-smoker group.

Phenotypes	Male		Female		Total	
	No.	(%)	No.	(%)	No.	(%)
Smokers	60	85.71	8	21.05	68	62.96
Non-Smokers	10	14.28	30	78.94	40	37.04
Total	70	100	38	100	108	100

The Chi-Square Statistics is 44.1601 And $p < 0.001$. The result is significant.

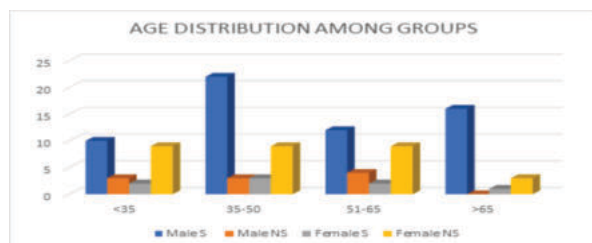
In our study mean age of participants was 48.8 ± 14.9 years with the majority of patients were in between 35 To 65 years. The mean age of smokers was higher than non-smokers with COPD. The mean age of males was higher than Females.



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	Male		Female		Total	
	S (%)	NS (%)	S (%)	NS (%)	No.	(%)
<35	10(16.6)	3(30)	2(25)	9(30)	24	22.22
35-50	22(36.6)	3(30)	3(37.5)	9(30)	37	34.25
51-65	12(20)	4(40)	2(25)	9(30)	27	25.0
>65	16(26.6)	0	1(12.5)	3(10)	20	18.51
Total	60(100)	10(100)	8(100)	30(100)	108	100

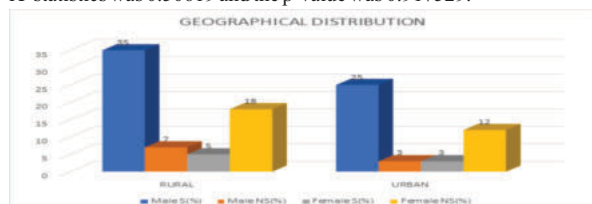
$P = 0.1684$ Which Is More Than 0.05.



Geographical Distribution:

	Male		Female		Total	
	S (%)	NS (%)	S (%)	NS (%)	No.	(%)
Rural	35(58.3)	7(70)	5(62.5)	18(60)	65	60.18
Urban	25(41.7)	3(30)	3(37.5)	12(40)	43	39.82
Total	60	10	8	30	108	100

χ^2 statistics was 0.50619 and the p-value was 0.917529.



Risk Factors Association

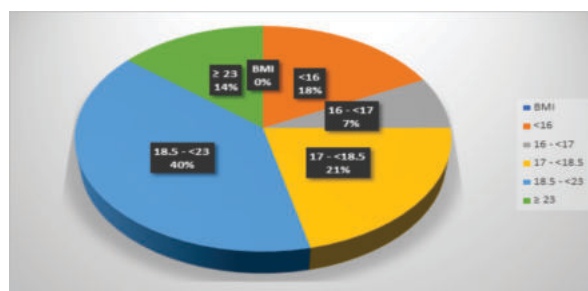
Risk Factor Association	Male		Female	
	S	NS	S	NS
Exposure To Biomass Smoke	3	3	6	10
Outdoor Air Pollution	9	1	2	5
Occupational Exposure	5	1	2	2
Treated Pulmonary Tuberculosis	6	4	4	9
Long-Standing Asthma	2	1	3	2
Childhood Infections	2	0	2	2



Table 2: Distribution Of Patients According To Their Body Mass Index (BMI) (N=108)

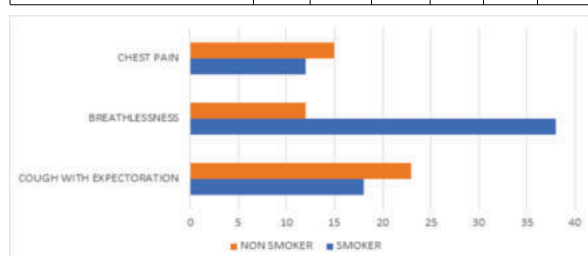
Bmi	Male		Female		Total	
	S	NS	S	NS	No.	(%)
<16	13	2	1	3	19	17.59
16 - <17	2	1	0	5	8	7.40
17 - <18.5	14	1	2	6	23	21.30
18.5 - <23	23	6	3	11	43	39.82
≥ 23	8	0	2	5	15	13.89
Total	60	10	8	30	108	100

$P = 0.000663$ so Result is significant.



Patients presented to the hospital with more than one complaint but in our study, we found that Cough with Expectoration was the most common presenting complaint in the non-smokers COPD group Followed by Breathlessness. While in the smokers COPD group Breathlessness was the most common presenting complaint followed by Cough with Expectoration. Chest Pain was the least presenting symptom in both groups.

Chief Symptoms	Male		Female		Total	
	S	Ns	S	Ns	No.	(%)
Cough With Expectoration	16	4	2	19	41	37.96
Breathlessness	34	5	4	10	53	49.07
Chest Pain	10	1	2	1	14	12.96
Total	60	10	8	30	108	100

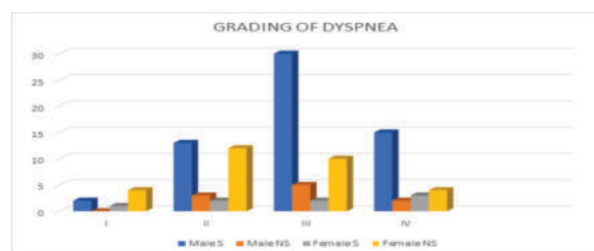


Dyspnea Grading

In our study, it was observed that the majority of smokers had the worst dyspnea compared to non-smokers in the COPD groups. Smokers with COPD more were having Severe and Very Severe Dyspnea Compared to Mild and Moderate Dyspnea in Non-Smokers COPD Groups.

Grade Of Dyspnea	Male		Female		Total	
	S	NS	S	NS	No.	(%)
I	2	0	1	4	7	6.48

II	13	3	2	12	30	27.77
III	30	5	2	10	47	43.51
IV	15	2	3	4	24	22.22
Total	60	10	8	30	108	100



DISCUSSION

This study was conducted in the Department of Tuberculosis and Respiratory Diseases, S.N. Medical College, Agra for 18 months. A cohort of 108 patients was enrolled on the study.

In our study smoker patients (62.96%) were higher than non-smokers (37.04%) in the total COPD patient cohort. There is a variation of (9-69%) in the proportion of non-smokers among different studies. Ehrlich et al¹ reported that 47.6% were non-smokers in their study. Brashier B et al⁶ reported that 68.6% of patients were non-smokers. Salvi ss et al 1990 reported that between 25-45% of COPD occurs in non-smokers⁷. The BOLD study revealed that 35% of patients have a smoking history worldwide and 65% of patients belong to the non-smoker group.⁸ Increase in the proportion of non-smoker COPD is due to an increase in environmental pollution, occupational exposure to various dust, and use of biomass fuel. Treatment of tuberculosis significantly increased in the past which leads to an increase in post tubercular patients having obstructive airway disease. The high prevalence of non-smoker COPD is alarming as this would result in considerable health and financial burden on individual families and the country.

In our study demographically gender distribution was comparable to the burden of obstructive lung disease (BOLD) study. 75% were female among non-smokers and 25% were male in our study whereas 67.2% were female and 30.8% were male in the BOLD study⁹. Overall male patients were higher at 70 (64.81%) than female patients at 38 (35.18%). Male patients were higher in our study due to increased smoking patterns in this region. Female patients are exposed to biomass fuel smoke during cooking in this region which leads to airflow limitation in the long term which may be one reason for more prevalence in the non-smoker's group. In our study mean age of smokers was 49.36±14.90 and the mean age of non-smokers was 47.85±15.70. The mean age of smokers and non-smokers were 56.2±11.7 and 56.3±11.2 respectively in a BOLD study⁹. The mean age in our study was slightly lower than in other studies. This difference could be due to geographical variation in prevalence of disease, ethnic and racial variations and high survival age in the western countries. The average age of smokers and non-smokers was 65.17 and 64.7 in a study done by Shah et al¹⁰ which was higher than our study and BOLD study may be due to low study participants.

The average body mass index (BMI) of the smoker was 19.34 kg/m² and the non-smoker's BMI was 19.58. Our data was comparable with Shah et al¹⁰ studies done in India which show 18.91 and 18.49 kg/m² in smokers and non-smokers respectively. Undernourished patients had lower lung function compared to those with high BMI¹¹. COPD is well-known to be a systemic disease which leads to cachexia. There is low income in our country and poor nutritional status in our region was also a responsible cause of low BMI. The BMI was significantly lower than in the BOLD study. Low BMI was also seen in Mexico¹¹ and Spain¹².

In our study, more than 60% of patients were from a rural background and less than 40% were from an urban background. Environmental exposures may explain the association between rural residence and increased COPD risk. Globally, exposure to biomass fuel is associated with respiratory symptoms and poor pulmonary function¹³. Agricultural work produces dust and vapours that can cause and/or exacerbate underlying lung disease. Agricultural workers may be exposed to ambient gasses and particles such as ammonia, pesticides, bacterial products and fungal spores, which collectively play a role in the development of COPD. Exposure to poultry and livestock has been

shown to increase the risk of COPD¹⁴ and worsen respiratory symptoms. Rural populations may be exposed to an increased load of ambient endotoxin and small particulate matter that may increase respiratory symptoms in patients with COPD. The majority of non-smoker patients were from rural backgrounds however no significant association was observed between geographical distribution and the development of COPD in our study.

Various risk factors were described and their prevalence in both groups was studied. Biomass fuel smoke is the most important and statistically significant risk factor for the development of COPD in non-smokers (p<0.03) which was comparable with other studies also¹². Outdoor air pollution is also a major risk factor for the development of COPD and in our study, it was significant (p<0.01). Post-tubercular lung disease was also a significant risk factor (p<0.05). In our study, we found that long-standing asthma and chronic childhood infections play a role in COPD but the data was not statistically significant.

In our study, smokers with COPD reported significantly more chronic cough and phlegm than never smokers, which is consistent with the knowledge that tobacco smoke is responsible for goblet cell hyperplasia and chronic hypersecretion of mucus. COPD patients frequently present with chest pain ranging from 44-88%¹⁵ but in our study chest pain was the least reported symptom. 12.96% of patients presented with complaints of chest pain overall and it was also less common in non-smokers 1.85%. Breathlessness was more severe in the smoker group in comparison to non-smokers due to more alveolar destruction, low skeletal muscle reserve and poor nutrition. In our study, Breathlessness was the most commonly observed symptom in 49% of patients followed by cough with expectoration seen in approximately 38%. Mild to moderate dyspnea was common in non-smoker COPD patients while smoker COPD patients were having more severe dyspnea (Grade III and IV). Tobacco smoking leads to chronic bronchial inflammation which leads to the obstruction that's why dyspnea was more severe in the smoker group.

CONCLUSION:

COPD is a major cause of morbidity and mortality worldwide and it is a preventable disease. Now non-smoker COPD makes a major chunk of the COPD cohort and there should be an emphasis on the cause of COPD development in these patients so timely intervention can be applied and we can slow down the progression of the disease. In our study female patients were higher in the non-smoker group due to low smoking habits but they were having more exposure to biomass fuel smoke. Post tubercular obstructive airway disease aptly called TOPD is also an important part of the COPD cohort in developing countries like India. Nutritional supplementation should also be taken care of as low BMI patients are having a more severe presentation. In our study males were more in the smoker group, having a more severe presentation and low BMI and the majority were from rural backgrounds. There is a need for education about COPD in rural populations and the promotion of smoking cessation may lead to healthy life in these patients.

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