

A Study on Chronic Obstructive Pulmonary Disease in Non Smokers

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Abstract

Background: Chronic Obstructive Pulmonary Disease (COPD) is a significant cause of chronic morbidity and mortality worldwide. COPD is commonly thought of as a condition caused by cigarette smoking. Epidemiological studies show that 5-12% of subjects with COPD are non-smokers. This study was undertaken to study the clinical profile of COPD in non-smokers and to identify other risk factors of COPD.

AIM: 1. To investigate the COPD clinical characteristics in non-smokers. 2. To identify the risk factors (other than smoking) of COPD.

Materials and Methods: A six-month hospital-based cross-sectional study was carried out in the Department of Medicine at Rajshree Medical and Research Institute, Bareilly. A total of 50 COPD patients who were non-smokers admitted to the hospital during this period were taken into the study.

Results: Of 50 patients, 76% were females, 66% had <5 years duration of illness. Cough and expectoration were present in all, followed by breathlessness and wheeze. In 84 percent of the cases, there was a history of biomass fuel exposure, and environmental tobacco smoke exposure was present in 100%. Occupational exposure was present in only 34%, and air pollution exposure was present in 16%.

Conclusion: Environmental tobacco smoke exposure and biomass fuel exposure were significant risk factors. According to this study, occupational exposure and air pollution were not significant risk factors.

Keywords: COPD; Tobacco Smoke; Occupational Exposure and Air Pollution, Exposure, Environment, Breathlessness and Wheeze.

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INTRODUCTION

COPD is a significant cause of chronic morbidity and mortality worldwide. Many people live with this disease for years before succumbing to it or its complications. COPD is the fourth greatest cause of death worldwide.¹ Its prevalence and mortality are expected to rise further in the future decades.² Tobacco usage continues to be a major contributor to COPD. However, tobacco smoking is



not the only cause of COPD, and in some regions of the world, it may not even be the primary cause. As the awareness of the ill effects of tobacco smoking has increased, the prevalence of tobacco smoking is coming down. However, the prevalence of COPD is increasing. This suggests that other risk factors of COPD are gaining more importance in aetiology.³

AIMS AND OBJECTIVES

1. To study the clinical profile of COPD in non-smokers.
2. To identify the risk factors (other than smoking) of COPD.

MATERIALS AND METHODS

A Hospital-based cross-sectional study was conducted in the Department of General Medicine, Rajshree Medical and Research Institute for six months after approval from the Hospital Ethics and Research Committee.

Sampling Technique and Sample Size:

All the selected COPD patients who were non-smokers admitted in Rajshree medical college, Bareilly fulfilling the inclusion criteria, were taken for study after taking prior informed consent. About 50 qualifying study subjects were undergone detailed history, clinical examination and laboratory investigations.

Inclusion Criteria:

- Patients with post-bronchodilator $FEV_1/FVC < 0.7$ who are nonsmokers.
- All Patients who were willing to participate and given informed and written consent.

Exclusion Criteria:

- Smokers
- Bronchial asthma
- Pulmonary tuberculosis (present or past)
- Interstitial lung disease
- Acute left ventricular failure and pulmonaryoedema
- All patients who were not willing to participate and were not given informed and written consent

DATA ANALYSIS

1. Data was collected using a pretested proforma meeting the study's objectives. Detailed history, physical examination and necessary investigations were undertaken.
2. To compare proportions, the chi-square test and Fisher's Exact test were used in statistical analysis. At a P-value of 0.05, statistical results were considered significant. <0.01.

RESULTS

Fifty cases were studied, and the following observations were made

Table 1: Sex distribution

Sex	Number of Patients	Percentage
Male	12	24
Female	38	76
Total	50	100

Out of the 50 cases studied, 38 patients were female, and 12 were male. The majority were females constituting 76%, and males constituting 24% with $p < 0.0001$, statistically significant.

Table 2: Age distribution

Age Group (years)	Number of Patients	Percentage
21-30	9	18
31-40	10	20
41-50	17	34
51-60	10	20
61-70	4	8
Total	50	100

The mean age of the patients studied was 43.9 ± 12.8 years, the minimum age was 21 years, and the maximum age was 70 years. The majority of the patients were in the age group of 41-50 years.

Table 3: Symptoms

Symptoms	Number of patients	Percentage
Cough	50	100
Sputum	50	100
Breathlessness	31	62
Wheezing	10	20
Swelling of lower line less	8	16
Fatigue	8	16
Weight loss	8	16
Fever	8	16
Chest pain	2	4

Cough and sputum were present in all of the patients while breathlessness was present in 62%, weight loss in 16%, fatigue in 16%, wheezing in 20%, swelling of lower limbs in 16%, fever in 16% and chest pain in 4% of the patients.

Table 4: Occupational exposure

Occupational Exposure	Number of Patients	Percentage
No exposure	33	66
Dust	10	20
Husk	3	6
Dust+Husk	1	2
Coaldust	1	2
Textile mill	2	4
Total	50	100

p-value-not significant

Out of 50 patients, Only 17 patients (34%) had a history of occupational exposure, ten patients (20%) had a history of dust exposure, one patient (2%) had a history of dust and husk exposure, and three patients (6%), had a history of husk exposure, one patient (2%) gave the history of exposure to coal dust and two patients (4%) gave the history of exposure to textile milldust. This was not statistically significant. Duration of exposure: Three patients (6%) said they had been exposed for less than ten years, where as 14 patients (28%) said they had been exposed for more than ten years. Fourteen patients (28%) gave the history of duration of exposure for >10 years.

Table 5: Exposure to air pollution

Pollution	Number of Patients	Percentage
Absent	42	84
Present	8	16

History of exposure to air pollution was present in 8 patients (16%), which was statistically not significant.

Table 6: Pulmonary function tests

	Pre-tests	Post test	P value
FEV ₁	1.5±0.54	1.7±0.5	0.001
FVC	2.9±1.95	3.01±1.3	0.796
FEV ₁ /FVC	55.05±15.9	59.4±17.7	0.064
PEFR	2.76±1.5	3.09±1.5	0.032

There was no significant change in pre-FVC (2.9;1.45) and post-FVC (3.01;1.3) on the pulmonary function test. Pre-FEV₁(1.5±0.54) and post-FEV₁(1.7±0.5) change was significant statistically. Pre-FEV₁/FVC(55.05±15.9) and post-FEV₁/FVC(59.4±17.7) change was not significant statistically. Pre-PEFR(2.76±1.5) and post-

PEFR (3.09±1.5) change was also not significant statistically.

DISCUSSION

In the present study, 50 cases were selected based on a simple random sampling method from the OPD and medical wards, Rajshree Medical and Research Institute, Bareilly who had post-bronchodilator FEV₁/FVC <0.7. The mean age of the present study population was 43.9±12.8 years which was comparable to the Behrendt *et al.* study. In the present study, females account for 76%, with a male: female ratio of 1:3.16, comparable to other study groups mentioned above. In the present study, cough and expectoration were predominant symptoms, followed by breathlessness and wheeze. Symptom profile is comparable with Mahesh *et al.* study; three patients (6%) stated that they had been exposed for fewer than ten years, where as 14 patients (28%) stated that they had been exposed for more than ten years, Which is comparable with Berglund *et al.* and Mahesh *et al.* study in the present study, occupational exposure was 34%, comparable to other studies. In the present study, the history of biomass fuel exposure was present in 84%, comparable to Goel S *et al.* and Mahesh *et al.* studies. In the present study, 84% of subjects were from a rural background, comparable to Goel S *et al.* study. In the present study, pre and post-bronchodilator FEV₁/FVC was comparable to Birring *et al.* study. The percentage change in pre and post-bronchodilator was 7.3% in the present study, comparable to Birring *et al.* study.

CONCLUSION

1. Females predominated in this sample of non-smokers with COPD.
2. Tobacco smoke exposure in the environment and biomass fuels were also significant risk factors.

According to this study, occupational exposure and air pollution were not significant risk factors. Pulmonary function test showed no significant change in pre and post bronchodilator FEV₁/FVC.

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