

ORIGINAL RESEARCH

A study on clinical profile of patients with chronic obstructive pulmonary disease

¹Dr.Vijay Shettar, ²Dr.Javeriya Mohammadi, ³Dr Sivasankari R, ⁴Dr.Aishwarya C

¹Pulmonologist, Assistant professor, VIMS, Ballari, Karnataka, India

²Pulmonologist, Assistant professor, Dr B R Ambedkar Medical College , Bangalore, Karnataka, India

³Pulmonologist, Senior Resident, Dr B R Ambedkar Medical College, Bangalore, Karnataka, India

⁴Pulmonologist, Assistant professor, Dr B R Ambedkar Medical College, Bangalore, Karnataka, India

Corresponding Author

Dr.VijayShettar

Pulmonologist, Assistant professor, VIMS, Ballari, Karnataka, India

Received: 12March, 2023

Accepted: 18April, 2023

ABSTRACT

In developing countries there is increase prevalence of smokers, and in high income countries, high prevalence of aging population, hence prevalence of COPD is expected to rise over next 30years and by 2030 it is estimated that 4.5million deaths occur annually from COPD and related conditions. All the patients presenting to Respiratory medicine department admitted with diagnosis of acute exacerbation of COPD. A sample size of 60 patients (30 interventional and 30 control) were taken by using single proportion- absolute precision method. Out of 60 patients, 90%(54) of them were males, 10%(6) were females. Both in cases and controls, males were 90%(27) and females were 10%(3). Out of 60 patients, 54(90%) were smokers and all were males, 6(10%) patients were non-smokers and all were females. Both in cases and controls, 90%(27) were smokers, 10%(6) were non-smokers. The mean duration of illness among cases was 6yrs and controls was 4yrs.

Keywords: Chronic Obstructive Pulmonary Disease, Smokers, Spirometry

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Introduction

Chronic Obstructive Pulmonary Disease (COPD) is a common, preventable and treatable disease that is characterized by persistent respiratory symptoms and airflow limitation that is due to airway and/or alveolar abnormalities usually caused by significant exposure to noxious particles or gases¹.

COPD is currently the fourth leading cause of death in the world.¹ It is projected to be the 3rd leading cause of death by 2020.² Globally, the burden is projected to be more in coming decades because of continued exposure to COPD risk factors and aging of the population^{3,4}.

The global burden of disease study reports a prevalence of 251 million cases in 2016.⁵ In 2015, 3.2 million people died from COPD worldwide, an increase of 11.6% (5.3-19.8) compared with 1990 accounting for 5% of all deaths globally⁶

In developing countries there is increase prevalence of smokers, and in high income countries, high prevalence of aging population, hence prevalence of COPD is expected to rise over next 30years and by 2030 it is estimated that 4.5million deaths occur annually from COPD and related conditions^{7,8}.

In India, the number of cases of COPD increased from 28.1 million (27.0-29.2) in 1990 to 55.3 million (53.1-57.6) in 2016, an increase in prevalence from 3.3% (3.1-3.4) to 4.2% (4.0-4.4). COPD was responsible for 75.6% of the chronic respiratory disease disability-adjusted life-years (DALYs) in India in 2016. Of the DALYs due to COPD in India in 2016, 53.7% (43.1-65.0) were attributable to air pollution, 25.4%

(19.5-31.7) to tobacco use, and 16.5% (14.1-19.2) to occupational risks, making these the leading risk factors for COPD.⁹

COPD should be considered in any patient who has dyspnoea, chronic cough or sputum production, and/or a history of exposure to risk factors for the disease.

Spirometry is required to make the diagnosis; the presence of a post-bronchodilator FEV1/FVC < 0.70 confirms the presence of persistent airflow limitation. The goals of COPD assessment are to determine the level of airflow limitation, the impact of disease on the patient’s health status, and the risk of future events (such as exacerbations, hospital admissions, or death), in order to guide therapy.¹⁰

Methodology

All the patients presenting to Respiratory medicine department admitted with diagnosis of acute exacerbation of COPD

Sample size: A sample size of 60 patients (30 interventional and 30 control) were taken by using single proportion- absolute precision method

Type of study: Prospective interventional study

Inclusion Criteria

- COPD Stage 2 to Stage 4 according to GOLD 2016 guidelines
- Either gender
- Age >40yrs
- Willing to give informed written consent

Exclusion Criteria

- Patients with persistent sepsis
- Patients with unstable angina, recent myocardial infarction, Congestive cardiac failure

- Haemoglobin < 10gm/dl
- Patients with tuberculosis/lung cancer
- H/O atopy
- Cognitive impairment
- Severe neurological disease
- Disabling Arthritis

Method of data collection

- Detailed clinical history and complete clinical examination was done
- Appropriate investigations were done (Complete haemogram, Blood sugar, Electrolytes, Chest x ray, Arterial blood gas analysis, Sputum for gram stain and culture and sensitivity, ECG, PFT at time of discharge)
- 60 patients were recruited for the study on the basis of inclusion and exclusion criteria and randomized into two groups (Interventional and Control group)
- A written informed consent was obtained from the patient
- Patients were treated according to GOLD (global initiative for chronic obstructive lung disease) 2016 guidelines. Interventional group received pulmonary rehabilitation in addition to usual care, two to three sessions daily of 20-30 minutes duration each session, from third day to tenth day/discharge whichever was latest. Pulmonary rehabilitation included education, psychological support, following exercises. Control group received only usual care.

Results

Table 1: Age wise distribution of patients studied

Age		
	Frequency	Percent
46 - 50 yrs	6	10.0
51 - 60 yrs	22	36.7
61 - 70 yrs	24	40.0
Above 70 yrs	8	13.3
Total	60	100.0

Table 2: Age wise distribution of patients between cases and controls

Age	Cases	Controls
46 - 50 yrs	6.7%	13.3%
51 - 60 yrs	33.3%	40.0%
61 - 70 yrs	43.3%	36.7%
Above 70 yrs	16.7%	10.0%

Most of the patients were in age group of 61-70yrs (40%). Most of the patients in intervention group were in age group of 61-70yrs (43.3%) and patients in control group were in age group of 51-60yrs (40%)

The median age in cases is 63yrs and in control group is 61yrs

Table 3: Gender wise distribution of patients

Sex	Frequency	Percent
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Female	6	10.0
Male	54	90.0
Total	60	100.0

Table 4: Cross tabulation between gender and cases and controls

		Crosstab			
			Groups		Total
			Cases	Controls	
Gender	F	Count	3	3	6
		%	10.0%	10.0%	10.0%
	M	Count	27	27	54
		%	90.0%	90.0%	90.0%
Total		Count	30	30	60
		% within Groups	100.0%	100.0%	100.0%

Out of 60 patients, 90%(54) of them were males, 10%(6) were females. Both in cases and controls, males were 90%(27) and females were 10%(3)

Table 5: Cross tabulation between smoking and cases and controls

		Smoking * Groups			
			Groups		Total
			Cases	Controls	
Smoking	No	Count	3	3	6
		%	10.0%	10.0%	10.0%
	Yes	Count	27	27	54
		%	90.0%	90.0%	90.0%
Total		Count	30	30	60
		% within Groups	100.0%	100.0%	100.0%

Table 6: Distribution of smoking among cases and controls

Smoking	Cases	Controls
No	10.0%	10.0%
Yes	90.0%	90.0%

Out of 60 patients, 54(90%) were smokers and all were males, 6(10%) patients were non-smokers and all were females. Both in cases and controls, 90%(27) were smokers, 10%(6) were non-smokers

Table 7: Cross tabulation between biomass fuel exposure and cases and controls

		Exposure To Biomass Fuel * Groups			
			Groups		Total
			Cases	Controls	
Exposure To Biomass Fuel	No	Count	27	27	54
		%	90.0%	90.0%	90.0%
	Yes	Count	3	3	6
		%	10.0%	10.0%	10.0%
Total		Count	30	30	60
		% within Groups	100.0%	100.0%	100.0%

Table 8: Distribution of biomass fuel exposure among cases and controls

Biomass fuel exposure	Cases	Controls
No	90.0%	90.0%
Yes	10.0%	10.0%

Out of 60 patients, 6 (10%) patients were exposed to biomass fuel and all were females.

In cases and control group, 3 in each group were exposed to biomass fuel

Table 9: Mean duration of illness among cases and controls

	Duration of Illness/ yrs
Cases	6
Controls	4

The mean duration of illness among cases was 6 yrs and controls was 4 yrs

Table 10: Mean fev1 in litres and percentage among cases and controls

	PFT (litres)	%
Cases	1.37	49.8
Controls	1.41	51.6

The mean FEV1 in cases was 49.8% (1.37lt) and controls was 51.6% (1.41lt)

Discussion

COPD results from complex interaction between genes and environment

- Cigarette smoking is the leading environmental risk factor for COPD, yet even for heavy smokers, only less than 50% develop COPD during their life time. Cigarette smokers have higher prevalence of respiratory symptoms and lung function abnormalities like increasing decline in FEV1 annually and greater mortality rate than non-smokers. Other type of tobacco like pipe, cigar, water pipe and marijuana are also risk factors. Passive smoking or environmental tobacco smoke and third hand smoke are also risk factors. In India, bidis are common form of tobacco used.
- Genetic factors: Hereditary deficiency of alpha 1 anti-trypsin, a major circulating inhibitor of serine proteases is a well-known genetic risk factor.
- Age and sex: Aging is one of the risk factor. Aging of airways and parenchyma simulates some of the structural changes associated with COPD. Prevalence of COPD is almost equal between men and women, reflecting changing patterns of tobacco smoking. In India, prevalence is more in men than women.
- Lung growth and development: Any factor that affects lung growth during gestation and childhood has potential of increasing risk of developing COPD.

Exposure to particles: Occupational exposures including organic, inorganic dusts, chemical agents and fumes which account for 10-20% of either symptoms or functional impairment

consistent with COPD. In India, indoor air pollution from biomass cooking and heating in poorly ventilated areas are important risk factors. Outdoor air pollutants (from vehicle emission, burning fuels, factories) increase COPD exacerbations and worsen pre-existing COPD.

- **Socio economic status:** Lower socio economic status is one of risk factor
- Asthma and airway hyper reactivity: Adults with asthma have a 12 fold risk of developing COPD over time compared to those without asthma after adjusting for smoking.
- **Infections:** A childhood severe respiratory infections has been associated with increased respiratory symptoms and decline in lung function in adulthood. HIV and tuberculosis have been identified as risk factor. The prevalence of airflow obstruction in subjects with pulmonary tuberculosis has been shown to vary from 28 to 68%.

Pathological changes are seen in airways, parenchyma and pulmonary vasculature. Changes include chronic inflammation with increased number of inflammatory cells in different parts of lung and structural changes resulting from repeated lung injury and repair.

Conclusion

- Out of 60 patients, 90% (54) of them were males, 10% (6) were females. Both in cases and controls, males were 90% (27) and females were 10% (3)
- Out of 60 patients, 54 (90%) were smokers and all were males, 6 (10%) patients were non-smokers and all were females. Both in cases and controls, 90% (27) were smokers, 10% (6) were non-smokers

- The mean duration of illness among cases was 6yrs and controls was 4yrs
- The mean FEV1 in cases was 49.8%(1.37lt) and controls was 51.6%(1.41lt)

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