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Risk Factors And Clinical Profile Of Chronic Obstructive Pulmonary Disease In Females.

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ABSTRACT

Exposure to biomass smoke is a major risk factor for COPD in Indian Females. Other risk factors causing COPD are tobacco smoking, occupational exposure to irritants, burning of crops, low socioeconomic status etc. It was a cross-sectional study done over a period of two years in Department of Respiratory Medicine of a tertiary care Hospital. 100 females above 40 years of age diagnosed with COPD as per GOLD criteria were enrolled. The mean age of the participants was 54.81 years \pm 9.86, with a range of 41-82 years and the median of 53 years. Biomass fuel exposure was major risk factor in 93% females ($P < 0.0001$), with 19.97 years being the mean duration of exposure. Tobacco smoking was rare. Dyspnea was the most prominent symptom (100%) though wheezes were less common (55%). Radiological examination revealed emphysema in only 15% patients. Biomass fuel exposure seems to be the single important factor for COPD in Indian females. Prominent pathology seems to be more of bronchitis than emphysema. Implementation of strategies to minimize biomass fuel exposure and providing alternate fuel for cooking may prevent COPD in Indian females.

Keywords: COPD, Females, Biomass fuel exposure, Risk factors

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INTRODUCTION

COPD is a common, preventable and treatable disease that is characterized by persistent respiratory symptoms and airflow limitations that is due to airway and/or alveolar abnormalities caused by significant exposure to noxious particles or gases. The chronic airflow limitation that is characteristic of COPD is caused by a mixture of small airway disease (obstructive bronchiolitis) and parenchymal destruction (emphysema), the relative contributions of which vary from person to person.¹

It is the world's leading cause of morbidity and mortality that induces an increase in social and economic burden.² The estimates for 2020, predict even further increase in the number of people suffering from disease. Its prevalence varies across countries and across different groups within the countries. It occurs as a result of a complex interplay of various factors. These factors include long-term cumulative exposure to toxic gases and particles which when combined with the variety of host factors like airway hyper-responsiveness, genetics and poor lung development in childhood result in COPD.³ Tobacco smoking is also one of the leading causes of COPD and mortality related to this has been identified as a burden in developing countries like India.⁴

In rural areas of developing countries, the women are exposed to inhalable particulate matter resulted from household solid biomass fuel combustion which has been identified as a significant risk factor for COPD in them.⁵ In addition, the biomass combustion out-turns high level of pollutants like carbon monoxide, nitrogen and sulphur oxides, formaldehyde, benzo(a)pyrene and benzene. These pollutants can form a significant source as respiratory irritants in the etiopathogenesis of COPD.⁶

The present study will be focused on assessment of clinical profile and risk factors in females causing COPD.

MATERIALS AND METHODS

Type of study- Cross-sectional study.

Place of study- Department of Respiratory Medicine, Dr. D.Y Patil Medical College, Hospital and Research Centre, Pimpri, Pune-411018

Period of study- September 2018 to September 2020

Sample Size- 100 cases

Inclusion criteria

- Females > 40yrs age
- Giving informed consent
- COPD diagnosed by gold criteria

Exclusion criteria

- Any evidence of post infective scarring of the lungs and pleura.
- Any Diffuse pulmonary lung disease.
- No h/o acute lung disease within last 4 weeks.
- Any contraindications of Spirometry.

Study Design

1. This study was carried out in two stages. In first stage a structured questionnaire was made for screening which includes Demographic details, Symptoms and Risk factors.
2. Written informed consent was obtained from all female attending outpatient department.
3. All females screened either on the basis of Symptoms or Risk factors is subjected for spirometry.

Criteria essential for diagnosis of COPD according GOLD guidelines is

- Forced expiratory volume in 1 second (FEV1) lower than 80% predicted post bronchodilator and (FEV1)/FVC less than 70% predicted will be seen in spirometry,
 - Reversibility criteria is less than 12% and 200 ml improvement in Postbronchodilator FEV1 in comparison to Prebronchodilator FEV1.
4. All screened females fulfilling the GOLD criteria of COPD were enrolled into the study.
 5. A validated questionnaire was delivered for enrollment in the study that will provide information on Demographic details, known Risk factors, Clinical symptoms, BMI, Spirometry, Chest ray and ECG to rule out cardiac diseases.

RESULTS

Table 1: Evaluation of age

Mean age	54.81 years
SD	9.86
Median	53 years
Minimum age	41 years
Maximum age	82 years

The mean age of the participants was 54.81 years (SD:9.86), with an age range of 41 to 82 years and median of 53 yrs.

Table 2: Evaluation of risk factors

Risk factor	No of subjects
Biomass fuel exposure	93
Cigarette smoking	2
Environmental tobacco smoke	1
Mosquito coil	1
Occupational exposure	1
Passive smoking	1
Tobacco smoker	1

*P<0.0001 (Most common risk factor was biomass fuel exposure)

Exposure to biomass fuel was majorly the risk factor in 93 patients, 2 had history of cigarette smoking, 1 patient each had exposure to environmental tobacco smoke, mosquito coil, passive smoking, tobacco smoker and had occupational

Table 3: Duration of exposure to risk factors

Duration of symptoms	Value (years)
Mean	19.97
SD	9.23
Median	20
Minimum	5
Maximum	60

The mean duration of exposure to risk factors was 19.97 years (SD:9.23). The median duration was 20 years, with a range of 5 to 60 years. Patients had a highly varied duration of exposure to risk factors. exposure.

Table 4: Evaluation of symptoms

Symptoms	No of subjects
Dyspnea	100
Cough	81
Wheeze	55
Chest pain	15

Primary symptoms were evaluated. Dyspnea was seen in all the 100 patients, cough was noted in 81 patients, wheeze was noted in 55 patients followed by chest pain in 15 patients.

Table 6: GOLD severity grading

Gold grade classification	No of subjects	Percentage
Grade-2	58	58%
Grade-3	32	32%
Grade-4	10	10%

According to GOLD severity grading 58% females were moderate (Grade 2), 32% severe (Grade 3) and 10% very severe (Grade 4) and none were in grade 1.

DISCUSSION

This was a Hospital based Cross-sectional study which was conducted on all Females more than 40 yrs of age attending Department of Respiratory Medicine and health camps conducted by institution over a period of 2 years. All screened females fulfilling the GOLD criteria of COPD were enrolled into the study. The present study has been done to look for risk factors and clinical profile of COPD in females.

In this study the mean age of the participants was 54.81 years with the standard deviation of 9.86, highest being 82 yrs and lowest 41 yrs and median of 53 yrs. When we compare our study by Soni N.A et al.⁷ It has been seen median age was 59 yrs which is similar to our study. Studies done by Lange et al. & Purohit et al. showed prevalence of chronic bronchitis in more in the age group of 60-65 yrs which does not match with our study.⁸

Present study showed biomass fuel exposure was major risk factors in 93 females (P< 0.0001), two had a history of cigarette smoking, one patient each had exposure to environmental tobacco smoke, mosquito coil, passive smoker and occupational exposure which was similar to the study done by Agrawal A. et al and also close to national data which was 90% for rural areas.⁹ In a study done by Van Gemert F et al cigarette smoking was an important risk factor for COPD while indoor biomass smoke was not taken into consideration.¹⁰ Important risk factors for COPD, especially in developed countries can be attributed to tobacco smoking, indoor biomass smoke and occupational exposures.

Our study showed that mean duration of exposure was 19.97yrs (SD:9.23), which is similar to study done by P.A mahesh et al where the duration of exposure was >20yrs.¹¹

In our study primary symptoms were evaluated, Dyspnea was seen in all the 100 patients, cough was noted in 81 patients, wheeze was noted in 55 patients followed by chest pain in 15 patients. In a study done by Jain N.K et al, all the patients complained of dyspnea of varying grades which was almost similar to study done by us.¹²

In our study, according to GOLD severity grading 58% females were moderate (Grade 2), 32% severe (Grade 3) and 10% (Grade 4) very severe and none in Grade 1 which is similar to the study done by Alam DS et al, More than half of the COPD cases were stage II COPD.¹³

Frequency of future exacerbations cannot be predicted in our study as there is no follow of the participants. Further studies can be done on this subject in a larger population of Indian females including both urban and rural to obtain the significant results.

CONCLUSION

Biomass fuel exposure contribute significantly to the burden of diseases in India as a part of developing world. The Implementation of strategies to minimise or eliminate exposure is very difficult because it must take into account both the degree of individual exposure as well as there cultural and economic aspects. Further, the domestic energy needs, the technical capability, environmental protection and the capital all these need to be considered. United effort in improving stove designs for cooking purposes and switching over to cleaner fuels which provide high efficiency with low emission can possibly be helpful in eliminating the great risk caused by biomass fuel in females.

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