

STUDY OF COPD IN WOMEN, WHO ATTEND IN THE DEPARTMENT OF RESPIRATORY MEDICINE, AGMC & GBP HOSPITAL

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ABSTRACT: Background: COPD is the leading cause of morbidity and mortality worldwide. Even though, the worldwide prevalence of COPD is growing faster in women than in men, but the impact of the COPD in women is significantly under studied; and most of the previous studies have also focused COPD in men. This study was conducted to estimate the prevalence of COPD in women and to identify the risk factors. **Materials and Method:** Women with symptoms of COPD, who attended in the Department of Respiratory Medicine during the period of one year were recruited. A detailed history about symptoms and risk factors were obtained, and then spirometry was performed to measure lung function. Data obtained from the subjects was analyzed. **Results:** The estimated prevalence of COPD in women is 4.9%. The 8.33% women were smokers. A large proportion (78.43%) of women were exposed to biomass smoke. A significant percentage of women were diagnosed as moderate (37.25%) and severe (30.39%) COPD. Indoor air pollution due to combustion of biomass fuels is an important identified risk factor. **Conclusion:** The COPD in women is very much prevalent. Chronic exposure to biomass smoke is associated with COPD in women who are using biomass fuels as energy source.

Key words: chronic obstructive pulmonary disease, biomass fuel, spirometry, pulmonary function test

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Introduction:

COPD is a preventable and treatable disease, characterized by progressive, poorly reversible airflow limitation, often with systemic manifestations, associated with an abnormal inflammatory response of the lung to noxious particles or gases. COPD is a leading cause of morbidity and mortality worldwide and results in an economic and social burden⁽¹⁾. It is the fourth leading cause of death worldwide; and by the year 2030, it is expected to rise to the third position as a cause of death and fifth position as the cause of loss of disability adjusted life years (DALYs). Globally, the reported prevalence of COPD is highly variable; ranging from 2 – 22% in men and from 1.2 – 19% in women. In India, the prevalence of COPD varied from 3 – 8% in men and from 2.5 – 4.5% in women^(2,3,4). Even though, tobacco smoking is the most commonly encountered risk factor for COPD

worldwide, but air pollution due to the burning of biomass fuels has also been identified as an important risk factor in many countries⁽¹⁾. Biomass fuels (animal dung, crop residue, wood) is an important source of energy in many countries, particularly in developing countries, where it has been used by the women for cooking and heating purposes^(5,6).

As of now, there is no cure for this disease; primary as well as secondary prevention is therefore, the key to reduce the growing burden of COPD^(3,7). The impact of the COPD in women is significantly under studied and the prevailing notion also that COPD primarily affects men may put women at particular risk of under diagnosis. Most of the previous studies have also focused COPD in men. However, the worldwide prevalence of COPD is growing faster in women than in men. Since the year 2000, more women than men have died from COPD^(8,9,10).

This study was conducted to estimate the prevalence of COPD in women, who attended in the dept. of Respiratory Medicine and also to identify the risk factor.

Materials and Methods:

This hospital based cross sectional study was conducted in the department of Respiratory-Medicine, Agartala Government Medical College & GBP Hospital.

The study was approved by the Institute's Ethical Committee and was conducted for a period of 1 year, from August, 2013 to July, 2014. The study was undertaken in women aged 35 years and above, who attended with symptoms of COPD (e.g. cough with or without expectoration, dyspnoea on exertion) in the department of Respiratory Medicine (OPD/and or IPD), during the study period.

The selection criteria included women aged 35 years and above and who did not report a history of bronchial asthma, pulmonary tuberculosis, cardiac diseases, pregnancy, diabetes- mellitus, and cancer.

Informed written consent was obtained from all, before recruitment. Once the person gave informed consent, to be part of the study, information on known risk factors (smoking habit, passive smoking, type of biomass fuel use, and others such as kitchen configuration) were collected. A detailed clinical history and thorough physical and systemic examinations were done for all study subjects. Chest X-ray (P-A view) was done in all participants to rule out complications and also to look for radiological changes associated with COPD (i.e., signs of hyperinflation, hyper-lucency, and rapid tapering of the vascular markings). All symptomatic women were then subjected to pulmonary function tests. The patient's age, height, and weight were recorded for use in the calculation of reference value. Pulmonary function test was performed following American Thoracic Society guidelines using a portable Spirometer. This test was performed in a sitting position and the subject was then asked to inhale

completely and rapidly and exhale maximally until no more air can be expelled while maintaining an upright posture. This same maneuvers were done for a minimum of three and not more than eight times, for acceptability and repeatability. The values of the largest FVC (Forced vital capacity) and largest FEV₁ (Forced expiratory volume in 1 second), and FEV₁/FVC ratio were taken. The data collected were compared with individual predictive values based on age, body weight, and height and were interpreted to arrive at the diagnosis.

Spirometry with reversibility testing (an increase of FEV₁ < 12% or 200 ml.) after inhalation of 200 µg of salbutamol was carried out in order to confirm COPD. The data collected were analyzed.

According to the GOLD guidelines, FEV₁/FVC ratio < 0.70 in a patient with a post bronchodilator FEV₁ < 80% of the predicted value is diagnostic of COPD; and the guidelines characterize the severity of COPD based on the clinical and the degree of airflow limitations determined by spirometry, into different severity categories; stage I to IV or mild to very-severe COPD. All patients have a FEV₁/FVC ratio < 0.70. In addition, Mild COPD (Stage I) is characterized by FEV₁ ≥ 80% predicted, Moderate COPD (Stage II) by 50% ≤ FEV₁ < 80% predicted, Severe COPD (Stage III) by 30% ≤ FEV₁ < 50% predicted and Very severe COPD- (Stage IV) by FEV₁ < 30% predicted or FEV₁ < 50% predicted and chronic respiratory failure⁽¹⁾.

Result:

During the study period, 4162 women were attended in the department of Respiratory Medicine; out of which 204 (4.90%) women were diagnosed as COPD. Majority (>70%) of the women were illiterate and with low socioeconomic status. 8.33% (17 no.) of the women were smokers, and smoked bidi, 24.51% (50 no.) were reported to have exposure to passive smoking from husband. A large proportion (78.43%) of women used Chula (wood, cow dung, leaves as biomass fuel) and 15.20% (31 no.) were

used cleaner fuel(LPG, Kerosene) for cooking and rest(6.37%) were involved in outdoor works. The average time spent in cooking was 4 - 6 hours per day. All the women had dyspnoea of varying grades, and other common symptoms were cough(98%), edema feet(10.2%), chest pain(8.9%) and hemoptysis(4.6%). 69.5% of the patients had chest radiographic changes consistent with COPD. Just over 10% of the patients had clinical, radiological and ECG evidence of cor-pulmonale.

Table-1 shows age distribution of the patients.

| Age group | No. of patients |
|----------------|-----------------|
| 35-44 yrs | 40(19.61%) |
| 45-54 yrs | 80(39.21%) |
| 55-64yrs | 46(22.55%) |
| 65-74yrs | 28(13.73%) |
| 75 yrs & above | 10(4.90%) |
| Total | 204 |

Table-1 shows that large no.(80) of the patients are in the age group of 45 – 54 years , and only 10(4.90%) patients are in the age group of 75 years & above.

Table-2 shows distribution of different stages of COPD

| Degree of Severity | No. of patients(%) |
|-----------------------|--------------------|
| Stage I(Mild) | 41(20.11%) |
| Stage II(Moderate) | 76(37.25%) |
| Stage III(Severe) | 62(30.39%) |
| Stage IV(Very severe) | 25(12.25%) |
| Total | 204 |

Table-2 shows that 41(20.11%) patients had mild, 76(37.25%) patients had moderate, 62(30.39%) patients had severe and 25(12.25%) patients had very severe obstruction.

Discussion:

This hospital based cross sectional study was conducted in women with symptoms of COPD, attended in the department of Respiratory Medicine(OPD/or IPD), Agartala Government- Medical College and GBP Hospital. Informed consent was taken from all the study subjects.

During the study period of one year, the prevalence of COPD in women was 4.9%. This result is higher than the earlier reports[by Jindal SK - 3.2%⁽²⁾, Gupta D et al-2.86%⁽⁴⁾, and Jindal SK - 2.7%⁽⁷⁾], because large proportion of women were exposed to risk factors(such as biomass smoke-78.43%, active smoking-8.33%, passive smoking-24.51%), and there is also possibility that as this hospital is tertiary center, more patients visit and also being referred from other centers . Our findings are consistent with earlier studies[Jindal SK⁽⁷⁾, Hu G et al⁽⁵⁾, Jain NK et al⁽¹⁰⁾, Orozco-Levi M et al ⁽¹¹⁾] suggested that exposed to indoor air pollution from domestic combustion of biomass fuels were an important risk factor for COPD in women. Jain NK et al⁽¹⁰⁾, and Jindal SK et al⁽¹²⁾, reported that combined exposure, from biomass smoke and smoking(active or passive) has an additive effect, which increases the risk for COPD and also causing more severe obstruction; in this study many women were reported to have combined exposure.

Rani M et al,⁽¹³⁾ reported that prevalence of smoking among women in the North-east region is high(Tripura-9.7%). In this study, 8.33%(17 no.) women were found to be smokers.

In this study, 78.43% women were reported to use biomass fuel in traditional Chula as an energy source, which is similar to the observation of Salvi S & Soumya PJ⁽¹⁴⁾. Large proportion(67.64%) of women were diagnosed to have moderate to severe obstruction, probably because majority of the women were illiterate and unaware of the disease; resulting that they seek medical attention when the disease has far advanced and interfering with normal activities, also that more no. of women had combined exposure, results in more severe obstruction, as reported by Jain NK et al⁽¹⁰⁾, and Jindal SK et al⁽¹²⁾.

This study, identifies some risk factors, however association between COPD and its risk factors has not been adequately

established, although the direction of association of the selected risk factors is similar to what is reported in the literature.

As long term exposure to biomass smoke is a major risk factor, hence a public health implications should include variety of measures, from improvement in fuels and cooking technologies to housing improvement.

Young adults have to be targeted early by the health authorities to promote awareness of the disease and its risk factors and thereby reduce the morbidity and mortality due to COPD.

Conclusion:

This hospital based cross sectional study has estimated the prevalence of COPD, in women, who attended in the department of Respiratory Medicine, based on clinical evaluation and objective lung function measurement. The impact of this disease in women is significantly under studied and also seem to be unrecognized by physician; but the emerging evidence suggests that women contribute significantly to the overall burden of COPD. The biomass smoke as an important risk factor has been recognized; in addition smoking, as it is high in this region, has also been contributed significantly.

It is hoped that the study results, can be used by the researchers as well as local public health officials in future for implementation of interventions to reduce the morbidity, mortality and economic burden due to COPD.

Disclosure of Interests:

We claim no potential conflicts of interest exist with any company/organizations whose products or services may be discussed in this article. Furthermore, we claim no personal, political, intellectual or religious interests that conflict with our interests.

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