

## ORIGINAL ARTICLE

# ASSESSMENT OF RISK FACTORS ASSOCIATED WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE: A CLINICAL STUDY

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### ABSTRACT:

**Background:** Chronic obstructive pulmonary disease (COPD) is a major cause of disability and death all over the world. In India, it is recognized as a major health problem requiring management from the primary health care level onwards. This study was conducted to estimate risk factors of COPD among study population. **Materials & Methods:** This study was conducted in year 2015. A total of 5000 patients examined and 502 found positive of COPD. A detailed clinical history was also obtained. For the diagnosis of COPD, three criteria were used. 1. Cough with expectoration on most days of the week for 3 months of the year for at least 2 consecutive years, 2. Forced expiratory volume in 1 second (FEV1) and (FEV1)/FVC value lower than 80% predicted as diagnosed by spirometry, and 3. Reversibility test result of B15% or B200 ml improvement in FEV1 compared to pre-bronchodilator FEV1. **Results:** Out of 5000 patients, 502 had COPD which included males (300) and females (202). The difference was non-significant (P > 0.05). We found that 350 were smokers and 152 were non smokers. The difference was significant (P- 0.01). 45% were using cigarette, 50% were using bidi, and 5% were using hookah. The difference was significant (P-0.02). 60% were using LPG as a fuel while 25% were using solid fuel and 15% were using kerosene. The difference was also significant (P- 0.02). Most of the patients were having middle status (65%) while 20% comprised of low status and only 15% consisted of high status. The difference was significant (P-0.03). 50% were from urban area, 35% were from rural area and only 15% were from both. 55% had education level more than high school while 45 % had less than high school. **Conclusion:** Chronic obstructive pulmonary disease has high morbidity and mortality rate. The main causative factors are smoking in the form of cigarette, bidi and hookah. Air pollution caused by combustion fuel is contributing factor.

**Key words:** Bidi, Chronic obstructive pulmonary disease, smoker

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## INTRODUCTION

Chronic obstructive pulmonary disease (COPD) is a major cause of disability and death all over the world. In India, it is recognized as a major health problem requiring management from the primary health care level onwards. It is responsible for a huge social and economic burden for the health care infrastructure. According to World Health Organization, the worldwide prevalence of COPD in 1990 was estimated at 9.34/1000 in men and 7.33/1000 in women. There have been a few reports on COPD epidemiology in India in the past. But most of those reports were based on studies on limited population groups.<sup>1</sup>

Chronic bronchitis and emphysema is collectively known as Chronic obstructive pulmonary disease. COPD is the name for a group of diseases that restrict air flow and cause

trouble breathing. The British Medical Research Council (BMRC) defined COPD as “daily productive cough for at least three consecutive months for more than two successive years. Chronic obstructive pulmonary disease (COPD) is considered as a major health problem and is main cause of disability leading to death and is responsible for a huge social and economic burden for the health care infrastructure.<sup>2</sup>

The development of COPD is multi-factorial and the risk factors of COPD include genetic and environmental factors. Pathological changes in COPD are observed in central airways, small airways and alveolar space. The proposed pathogenesis of COPD includes proteinase-antiproteinase hypothesis, immunological mechanisms, oxidant-antioxidant balance, systemic inflammation, apoptosis and ineffective repair.<sup>3</sup> Smoking, consumption of

biomass and environmental exposures are various causative factors for COPD. Biomass combustion results in high levels of pollutants such as benzopyrene, carbon monoxide, formaldehyde, oxides of nitrogen and sulphur, and benzene that are a major source of respiratory irritants leading to COPD.<sup>4</sup> Common symptoms includes chronic cough, chronic phlegm production, shortness of breath while doing things you used to be able to do, not being able to take a deep breath and wheezing. This study was conducted to estimate the risk factors of COPD among study population.

**MATERIALS & METHODS**

This study was conducted in year 2015. A total of 5000 patients examined and 502 found positive of COPD. A detailed clinical history was also obtained. Patient demographic information such as name, age, sex, history of smoking, type of cooking fuel combustion, was recorded. For the diagnosis of COPD, three criteria were used. 1. cough with expectoration on most days of the week for 3 months of the year for at least 2 consecutive years, 2. forced expiratory volume in 1 second (FEV1) and (FEV1)/FVC value lower than 80% predicted as diagnosed by spirometry, and 3. reversibility test result of B15% or B200 ml improvement in FEV1 compared to

prebronchodilator FEV1. Results thus obtained were tabulated and subjected to statistical analysis. P value < 0.05 was considered significant.

**RESULTS**

Table I shows that out of 5000 patients, 502 had COPD which included males (300) and females (202). The difference was non significant. Graph I shows that 350 were smokers and 152 were non smokers. The difference was significant (P- 0.01). Table II shows that 45% were using cigarette, 50% were using bidi, and 5% were using hookah. The difference was significant (P-0.02). 60% were using LPG as a fuel while 25% were using solid fuel and 15% were using kerosene. The difference was also significant (P- 0.02). Graph II shows that most of the patients were having middle status (65%) while 20% comprised of low status and only 15% consisted of high status. The difference was significant (P-0.03). Graph III shows that 50% were from urban area, 35% were from rural area and only 15% were from both. Graph IV shows that 55% had education level more than high school while 45 % had less than high school.

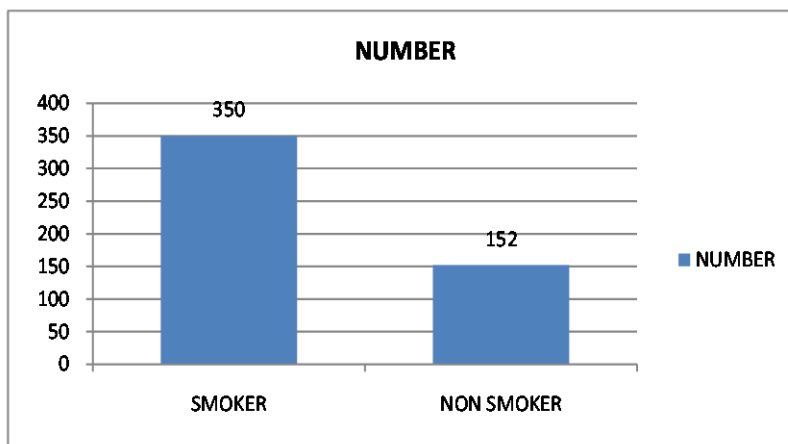
**Table I** Distribution of patients

Total- 502			
Gender	Male	Female	P value
Number	300	202	0.7

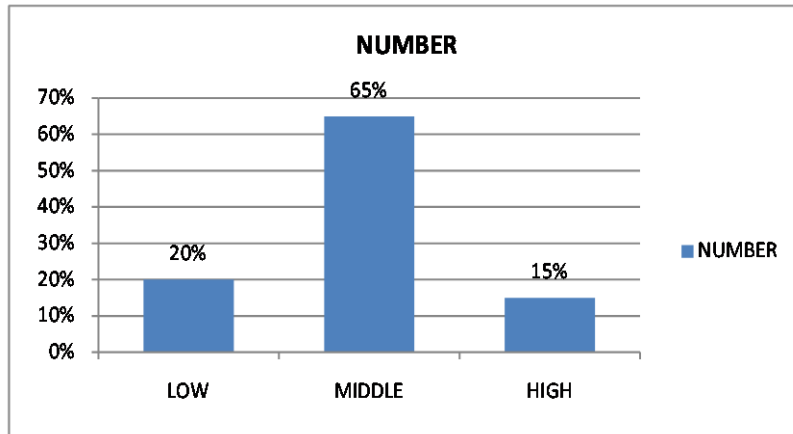
**Table II** Types of smoking and cooking fuel combustion

	Number	Percentage
<b>Smoking</b>	350	100%
<b>Cigarette</b>	158	45%
<b>Bidi</b>	175	50%
<b>Hookah</b>	17	5%
<b>Combustion fuel</b>	100	100%
<b>LPG</b>	60	60%
<b>Kerosene</b>	25	25%
<b>Solid fuel</b>	15	15%

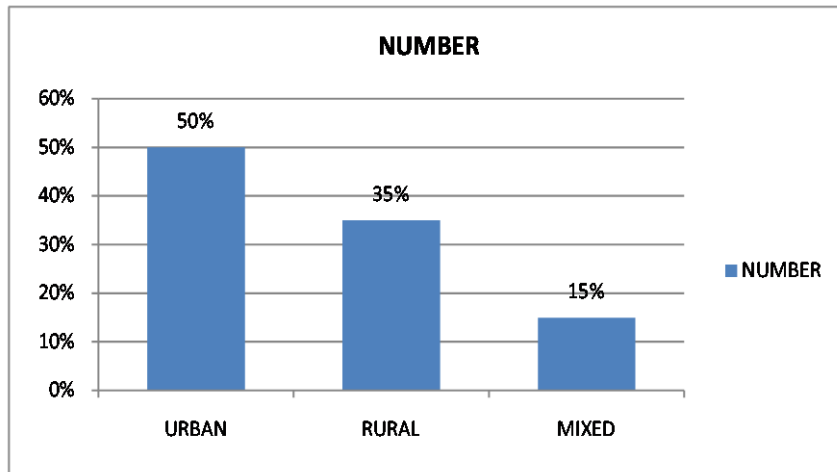
**Graph I** Smokers and non smokers



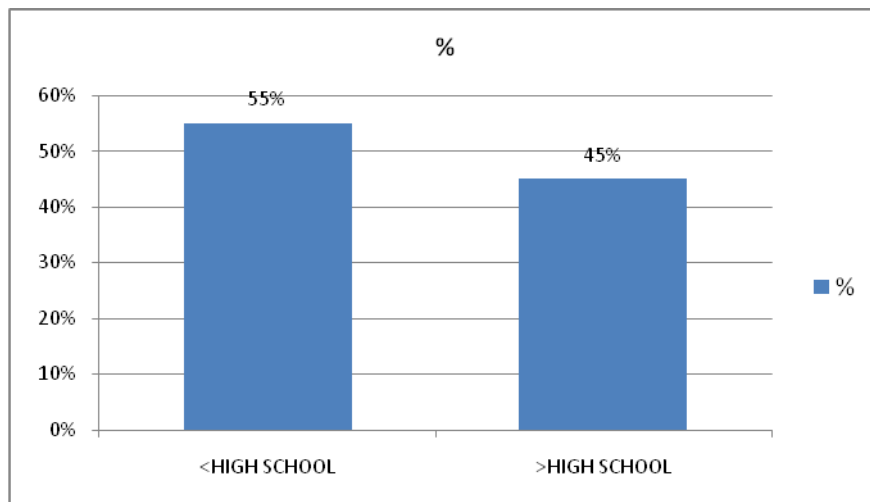
**Graph II** Socioeconomic status



**Graph III** Residential status



**Graph IV** Education status



## DISCUSSION

The COPD prevalence has been widely reported from several countries including India. Different epidemiology investigators have employed different definitions and methodologies in their reports. COPD has high mortality rates and is universally present. Few studies indicated that smoking is the main cause of COPD while few stated that use of combustion fuel is also one of the contributing factor.<sup>5,6</sup>

Out 5000 patients, 502 (10.0%) were positive for COPD. It comprised of 350 males and 152 females. In present study, we found that 350 were smokers and 100 were non smokers. Thus we can state that smoking is one of the major factors leading to COPD. Zahid<sup>7</sup> found in his study that smoking is the leading cause of COPD. Smoking as the cause of COPD has been established through several major international reports. It was five times more common in smokers in the NHANES III survey.<sup>8,9</sup> In our study, we also found similar results. Among smoking, 55% were bidi smokers. Aggarwal<sup>10</sup> in his study found bidi as the most common way of smoking especially in rural population. However study by Sharafkhaneh A<sup>11</sup> found cigarette as one of the cause of COPD.

We found that 55% of patients were LPG users. Setta<sup>12</sup> in his study stated that COPD among females are due to air pollution caused by combustion fuel. He found low prevalence of smoking among females. Middle status patients were seen in 65% of cases. 20% were high status and 15% were low status patients. We found that 55% patients were from urban area and 40% were from rural area. 60% of patients had more than high school education while 40% had less than high school education.

Assessment of airflow limitation, physician diagnosed COPD or estimates based on published studies are some of the other methods used in COPD epidemiology.<sup>13</sup> All these methods have their own advantages and disadvantages in terms of their field application, variable sensitivities and specificities to diagnose COPD and the costs of measurements. For example, measurement of airflow limitations with either a PEF meter or a spirometer is more specific to document obstruction but suffers from the lack of standardization of measurement in the field and the use of different cut points to define airflow limitation in different studies. Different definitions of airway obstruction are shown to produce prevalence estimates that vary by more than 200%.<sup>14</sup>

## CONCLUSION

Chronic obstructive pulmonary disease has high morbidity and mortality rate. The main causative factors are smoking in the form of cigarette, bidi and hookah. Air pollution caused by combustion fuel is contributing factor.

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