

# Original Article

## Assessment of risk factors for chronic obstructive pulmonary disease

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### ABSTRACT:

**Background:** Chronic obstructive pulmonary disease (COPD) is expected to become the third leading cause of death by 2023. The present study was conducted to assess risk factors of chronic obstructive pulmonary disease (COPD). **Materials & Methods:** 80 diagnosed cases of chronic obstructive pulmonary disease (COPD) of both genders were enrolled. Parameters such as forced vital capacity (FVC), forced expiratory volume in 1 second (FEV1) and total expiratory time was recorded. History of smoking, BMI, education, allergy history, family history, biomass burning, poor house ventilation etc. was recorded. **Results:** out of 80 patients, males were 55 and females were 25. 74% were smoker and 26% were non-smoker, primary education was seen in 60% and secondary education in 40%, 35% were underweight, 20% were overweight and 45% were normal. 30% were using household kerosene, 50% were using wood and 20% using LPG. Allergy history was seen in 40% and family history in 32%. The difference was significant (P< 0.05). **Conclusion:** Common risk factors of COPD was allergy history, family history, use of wood as fuel, male gender, low BMI and low education.

**Key words:** Allergy, COPD, Smoking

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### INTRODUCTION:

Chronic obstructive pulmonary disease (COPD) is expected to become the third leading cause of death by 2023.<sup>1</sup> It is characterized by progressive airflow obstruction and the destruction of lung parenchyma.<sup>2</sup> Tobacco smoking is the main cause of COPD and it is also the main determinant of a poor outcome in those who have the disease. Other factors may influence the risk of developing COPD.<sup>3</sup> The host factors that seem to play a major role are age, a previous history of asthma, genes and early respiratory infections. Among environmental determinants, occupational exposures and exposure to biomass smoke are primary risk factors. The role of sex, socioeconomic status and body mass index (BMI) on the risk of developing COPD is still open to debate.<sup>4</sup> Cigarette smoking is the major cause of COPD worldwide.<sup>5</sup> However, in developing countries exposure to air pollution responsible for non-tobacco-smoking COPD might predominate. Recent studies have described non-tobacco-smoking COPD due to indoor pollution resulting from the use of biomass

fuel and open fires for domestic purposes in poorly ventilated households.<sup>6</sup> This observation has a substantial impact on COPD in rural communities, particularly among females and their young children who are routinely engaged in cooking activities.<sup>7</sup> The present study was conducted to assess risk factors of chronic obstructive pulmonary disease (COPD).

### MATERIALS & METHODS:

The present study comprised of 80 diagnosed cases of chronic obstructive pulmonary disease (COPD) of both genders. All patients were enrolled with their written consent.

Data such as name, age, gender etc. was recorded. A thorough physical and clinical examination was performed. Parameters such as forced vital capacity (FVC), forced expiratory volume in 1 second (FEV1) and total expiratory time was recorded. History of smoking, BMI, education, allergy history, family history, biomass burning, poor house ventilation etc. was recorded. Results were determined statistically with p value significant below 0.05.

### RESULTS:

**Table I Distribution of patients**

Total- 80		
Gender	Males	Females
Number	55	25

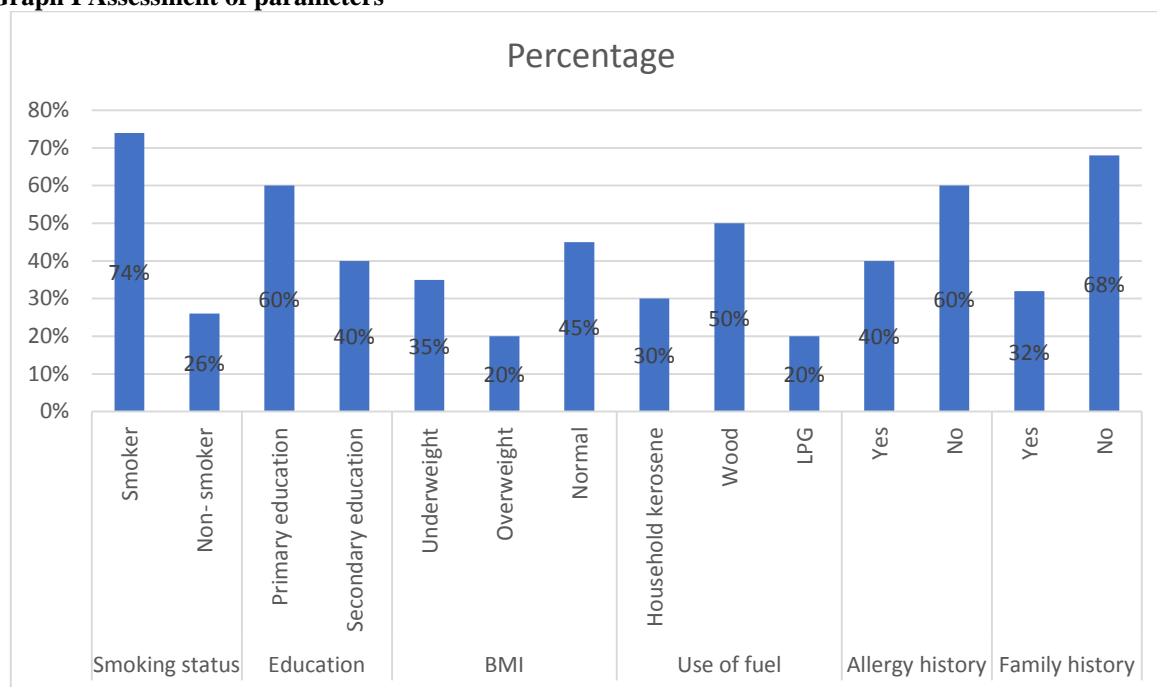
Table I shows that out of 80 patients, males were 55 and females were 25.

**Table II Assessment of parameters**

Parameters	Variables	Percentage	P value
Smoking status	Smoker	74%	0.01
	Non- smoker	26%	
Education	Primary education	60%	0.04
	Secondary education	40%	
BMI	Underweight	35%	0.05
	Overweight	20%	
	Normal	45%	
Use of fuel	Household kerosene	30%	0.05
	Wood	50%	
	LPG	20%	
Allergy history	Yes	40%	0.04
	No	60%	
Family history	Yes	32%	0.02
	No	68%	

Table II, graph I shows that 74% were smoker and 26% were non- smoker, primary education was seen in 60% and secondary education in 40%, 35% were underweight, 20% were overweight and 45% were normal. 30% were using household kerosene, 50% were using wood and 20% using LPG. Allergy history was seen in 40% and family history in 32%. The difference was significant ( $P < 0.05$ ).

**Graph I Assessment of parameters**



**DISCUSSION:**

The current knowledge about the causes of COPD is generally based on data coming from the elderly population in whom the disease is frequent.<sup>8</sup> However, the risk factors for the early inception of COPD are not well known, because only a few surveys have addressed young populations.<sup>9</sup> Furthermore, no studies have investigated to what extent the identification of the risk factors of COPD depends on the criteria used to define the disease. Tobacco smoke is the major risk factor for COPD and the population-attributable risk of smoking for COPD has been estimated in the range of 50 to 70%.<sup>10</sup> The mechanisms responsible for the fact that some

smokers develop COPD and others do not are not completely understood. Young adults are a segment of the population in whom COPD may be caused by factors other than smoking, due to the relatively low cumulative exposure to tobacco smoke.<sup>11,12</sup> The present study was conducted to assess risk factors of chronic obstructive pulmonary disease (COPD). We found that out of 80 patients, males were 55 and females were 25. Marco et al<sup>13</sup> investigated COPD risk factors in an international cohort of young adults using different spirometric definitions of the disease. They studied 4,636 subjects without asthma who had prebronchodilator FEV1/FVC measured in the European Community Respiratory Health Survey both

in 1991 to 1993 and in 1999 to 2002. COPD was defined according to the Global Initiative for Chronic Obstructive Lung Disease fixed cut-off criterion (FEV<sub>1</sub>/FVC, 0.70), and two criteria based on the Quanjer and LuftiBus reference equations (FEV<sub>1</sub>/FVC less than lower limit of normal). COPD determinants were studied using two-level Poisson regression models. Measurements and Main Results: COPD incidence ranged from 1.85 (lower limit of normal [Quanjer]) to 2.88 (Global Initiative for Chronic Obstructive Lung Disease) cases/1,000/yr. Although about half of the cases had smoked less than 20 pack-years, smoking was the main risk factor for COPD, and it accounted for 29 to 39% of the new cases during the follow-up. Airway hyperresponsiveness was the second strongest risk factor (15–17% of new cases). Other determinants were respiratory infections in childhood and a family history of asthma, whereas the role of sex, age, and of being underweight largely depended on the definition of COPD used.

We found that 74% were smoker and 26% were non-smoker, primary education was seen in 60% and secondary education in 40%, 35% were underweight, 20% were overweight and 45% were normal. 30% were using household kerosene, 50% were using wood and 20% using LPG. Allergy history was seen in 40% and family history in 32%. Multiple studies demonstrate that more than 15% of smokers will develop chronic airway obstruction with COPD criteria, with a range of 25%-50%. Second hand smoke, i.e., ambient cigarette smoke inhaled by non-smokers, represents another important risk factor. Macrophages may be activated by cigarette smoke and other irritants to release neutrophil-chemotactic factors, such as leukotriene B<sub>4</sub> (LTB<sub>4</sub>) and interleukin (IL)-8.<sup>14</sup> Neutrophils and macrophages release multiple proteinases that break down connective tissue in the lung parenchyma resulting in emphysema, and stimulate mucus secretion. While the use of tobacco is responsible for most cases of COPD, there are other inhalational agents responsible for the development of this disease like biomass fuel smoke, still used in developing countries and estimated to affect 3 billion people worldwide.<sup>15</sup> Also, occupational exposure to dust, fumes and smoke are related to the increased prevalence of chronic symptoms, accelerated decline in FEV<sub>1</sub> and establishment of COPD.

#### CONCLUSION:

Authors found that common risk factors of COPD was allergy history, family history, use of wood as fuel, male gender, low BMI and low education.

#### REFERENCES:

1. Kirilloff LH, Carpenter V, Kerby GR, et al. Skills of the health team involved in out-of-hospital care for patients with COPD. *Am Rev Respir Dis* 1986; 133: 948–949.

2. Stockley RA, Mannino D, Barnes PJ. Burden and pathogenesis of chronic obstructive pulmonary disease. *Proc Am Thorac Soc* 2009; 6: 524–526.
3. Teo WS, Tan WS, Chong WF, et al. Economic burden of chronic obstructive pulmonary disease. *Respirology* 2012; 17: 120–126.
4. Viegi G, Pedreschi M, Pistelli F, et al. Prevalence of airways obstruction in a general population: European Respiratory Society vs American Thoracic Society definition. *Chest* 2000; 117: 5 Suppl. 2, 339S–345S.
5. Fullerton DG, Gordon SB, Calverley PM. Chronic obstructive pulmonary disease in non-smokers. *Lancet* 2009; 374: 1964–1966.
6. Hopkinson NS, Polkey MI. Chronic obstructive pulmonary disease in non-smokers. *Lancet* 2009; 374: 1964–1966.
7. Gould NS, Min E, Gauthier S, Chu HW, Martin R, Day BJ. Aging adversely affects the cigarette smoke induced glutathione adaptive response in the lung. *Am J Respir Crit Care Med* 2010;182:1114–1122.
8. Guerra S. Overlap of asthma and chronic obstructive pulmonary disease. *Curr Opin Pulm Med* 2005;11:7–13.
9. Weiss ST. What genes tell us about the pathogenesis of asthma and chronic obstructive pulmonary disease. *Am J Respir Crit Care Med* 2010;181:1170–1173.
10. Martinez FD. The origins of asthma and chronic obstructive pulmonary disease in early life. *Proc Am Thorac Soc* 2009;6:272–277.
11. Hnizdo E, Sullivan PA, Bang KM, Wagner G. Association between chronic obstructive pulmonary disease and employment by industry and occupation in the US population: a study of data from the Third National Health and Nutrition Examination Survey. *Am J Epidemiol* 2002;156:7382746.
12. Torres-Duque C, Maldonado D, Perez-Padilla R, Ezzati M, Viegi G. Forum of International Respiratory Studies (FIRS) Task Force on Health Effects of Biomass Exposure. Biomass fuels and respiratory diseases: a review of the evidence. *Proc Am Thorac Soc* 2008;5: 577–590.
13. De Marco R, Accordini S, Marcon A, Cerveri I, Antó JM, Gislason T, Heinrich J, Janson C, Jarvis D, Kuenzli N, Leynaert B. Risk factors for chronic obstructive pulmonary disease in a European cohort of young adults. *American journal of respiratory and critical care medicine*. 2011 Apr 1;183(7):891-7.
14. Mannino DM, Buist AS. Global burden of COPD: risk factors, prevalence, and future trends. *Lancet* 2007;370:765–773.
15. de Marco R, Accordini S, Cerveri I, Corsico A, Anto JM, Kuenzli N, Janson C, Sunyer J, Jarvis D, Chinn S, et al. Incidence of chronic obstructive pulmonary disease in a cohort of young adults according to the presence of chronic cough and phlegm. *Am J Respir Crit Care Med* 2007;175:32–39.