Risk Factors of Chronic Obstructive Pulmonary Disease

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ABSTRACT

Background: To assess risk factors for chronic obstructive pulmonary disease.

Material and Methods: 80 patients of chronic obstructive pulmonary disease (COPD) of both genders were enrolled. History of smoking, BMI, education, allergy history, family history, biomass burning, poor house ventilation etc. was recorded.

Results: Out of 80 patients, males were 52 and females were 28. Allergy history was seen in 34 and family history was positive in 40. Education level was upto primary seen in 46 and secondary in 34. BMI found to be under-weight in 25, overweight in 35 and normal in 20. Fuel used was household kerosene in 20, wood in 60 and LPG in 10. 55 were smoker and 25 were non- smoker. The difference was significant (P< 0.05).

Conclusion: Common risk factors of chronic obstructive pulmonary disease were family history, low BMI, low education, male gender, allergy history and use of wood as fuel.

INTRODUCTION

Chronic obstructive pulmonary disease (COPD) is one of the common respiratory diseases, characterized by airflow limitation, which can be prevented and treated.[1] According to World Health Organization (WHO), about 3 million people died of COPD in 2005, which count for 5% of the total mortality worldwide. It is expected that by 2030, COPD will become the world's third largest lethal disease. In a time of aging populations, COPD is becoming more and more serious, with high and increasing morbidity and mortality, especially in developing countries.[2] The proposed pathogenesis of COPD includes proteinase antiproteinase hypothesis, immunological mechanisms, oxidant-antioxidant balance, systemic inflammation, apoptosis and ineffective repair. Smoking, consumption of biomass and environmental exposures are various causative factors for COPD.[3] Cigarette smoking is the major cause of COPD worldwide. However, in developing countries exposure to air pollution responsible for non-tobacco-smoking COPD might predominate.[4] 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. 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.[5] The present study was conducted to assess risk factors for chronic obstructive pulmonary disease.

MATERIAL & METHODS

A sum total of eighty patients of chronic obstructive pulmonary disease (COPD) of both genders were enrolled in this prospective observational study. All gave their written consent for the participation in the study. Ethical approval was obtained before starting the study.

Demographic profile was recorded in case sheet. 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. Smoking, BMI, education, allergy history, family history, biomass burning, poor house ventilation etc. was also recorded in case history sheet. Results thus obtained were subjected to statistics using chi- square test. P value less than 0.05 was considered significant.
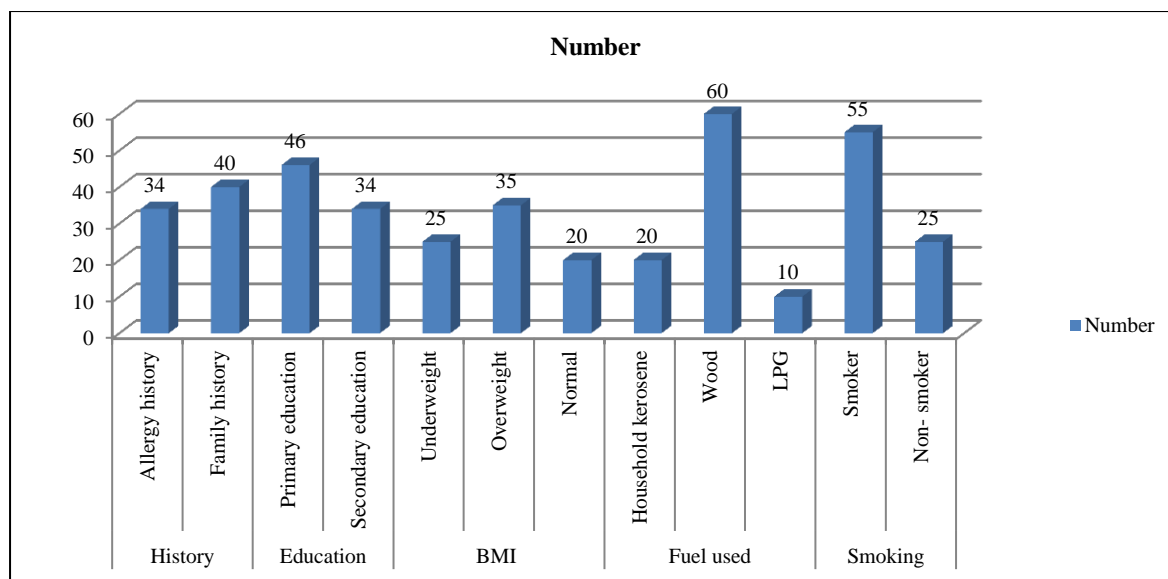
RESULTS

Table I Distribution of patients

Total- 80		
Gender	**Males**	**Females**
Number	52	28

Out of 80 patients, males were 52 and females were 28 (Table I).

Table II Risk factors for chronic obstructive pulmonary disease

Parameters	Variables	Number	P value
History	Allergy history	34	0.72
	Family history	40	
Education	Primary education	46	0.05
	Secondary education	34	
BMI	Underweight	25	0.81
	Overweight	35	
	Normal	20	
Fuel used	Household kerosene	20	0.02
	Wood	60	
	LPG	10	
Smoking	Smoker	55	0.01
	Non- smoker	25	

Allergy history was seen in 34 and family history was positive in 40. Education level was upto primary seen in 46 and secondary in 34. BMI found to be under-weight in 25, overweight in 35 and normal in 20. Fuel used was household kerosene in 20, wood in 60 and LPG in 10. 55 were smoker and 25 were non- smoker. The difference was significant (P< 0.05) (Table II, graph I).

Graph I Risk factors for chronic obstructive pulmonary disease

DISCUSSION

The hallmark of COPD is a poorly reversible and progressive airflow limitation resulting from prolonged exposure to inhalational noxious pulmonary agents that initiates detrimental chronic airway inflammation and lung damage. Patients with COPD generally present with chronic cough and sputum production with or without dyspnoea.[6] This clinical presentation tends to be ignored by patients until they present late for treatment at advanced stages of disease, often after developing intolerable dyspnoea.[7] In the past three decades, a number of important advances have been made in the treatment of patients with chronic obstructive pulmonary disease (COPD).[8,9] For example, supplemental oxygen therapy and smoking cessation have resulted in improved traditional outcome measures, such as mortality and rate of forced expiratory volume in one second (FEV1) decline. Although these end-points are important to clinicians and patients alike, survival and physiological measures do not fully represent the experiences of patients with COPD.[10] The present study was conducted to assess risk factors for chronic obstructive pulmonary disease.

Out of 80 patients, males were 52 and females were 28. Marco et al[11] 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. 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 hyper-responsiveness was the second strongest risk factor. 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.

Our results demonstrated that Allergy history was seen in 34 and family history was positive in 40. Education level was upto primary seen in 46 and secondary in 34. BMI found to be under-weight in 25, overweight in 35 and normal in 20. Fuel used was household kerosene in 20, wood in 60 and LPG in 10. 55 were smoker and 25 were non- smoker. Aggarwal et al[12] estimated prevalence of bronchial asthma in different regions of India and to define risk factors influencing disease prevalence. One or more respiratory symptoms were present in 4.3-10.5% subjects. Asthma was diagnosed in 2.28%, 1.69%, 2.05 and 3.47% respondents respectively at Chandigarh, Delhi, Kanpur and Bangalore, with overall prevalence of 2.38%. Female sex, advancing age, usual residence in urban area, lower socio-economic status,

history suggestive of atopy, history of asthma in a first degree relative, and all forms of tobacco smoking were associated with significantly higher odds of having asthma.

Criner GJ et al[13] in their study assessed the efficacy of lung volume reduction surgery in patients with emphysema. Non-smoking subjects with bilateral moderate-severe emphysema on chest CT scan, moderate-to-severe airflow limitation ($FEV_1 \leq 45\%$ of predicted), hyperinflation (total lung capacity $\geq 110\%$ of predicted and residual volume capacity $\geq 220\%$ of predicted) were enrolled. Subjects were randomized to either maximal medical therapy, including pulmonary rehabilitation, or to lung volume reduction surgery plus maximal medical therapy. Results showed that survival was improved in all subjects, and subjects with upper lobe–predominant emphysema and low exercise capacity had the greatest survival benefit.

Mehta et al[14] found evidence of an increased risk of COPD in never-smokers with occupational exposure to biological powder (OR 3.14, 95%CI 0.88–11.24), mineral powder (OR 3.22, 95%CI 0.84–12.36), exposure to gas and vapours (OR 3.94, 95%CI 1.23–12.58) and VGDF (OR 3.28, 95%CI 1.03–10.41). Hagstad S et al[15] obtained an OR of 1.85 (95%CI 1.03–3.33) for development of COPD with exposure to gas, dust or vapours.

CONCLUSION

Common risk factors of chronic obstructive pulmonary disease were family history, low BMI, low education, male gender, allergy history and use of wood as fuel.

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