

## Original Research Article

# A case control study in BMC Sagar to assess the risk factors of COPD

Ramesh Pandey<sup>1\*</sup>, Shikha Pandey<sup>2</sup>

<sup>1</sup>Department of Medicine, BMC Sagar Madhya Pradesh, India

<sup>2</sup>Department of Obstetrics and Gynaecology, BMC Sagar Madhya Pradesh, India

**Received:** 26 June 2017

**Revised:** 29 June 2017

**Accepted:** 07 July 2017

### \*Correspondence:

Dr. Ramesh Pandey,

E-mail: [pandeyrameshdr1999@gmail.com](mailto:pandeyrameshdr1999@gmail.com)

**Copyright:** © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

### ABSTRACT

**Background:** Chronic obstructive pulmonary disease is defined as a disease which is characterized by airflow limitation that is not fully reversible. COPD is a major health concern in India in terms of morbidity and mortality. In a developing country like India, it is a big challenge to limit the growing burden of COPD. A case control study was carried out at Bundelkhand Medical College (BMC) Hospital, Sagar, Madhya Pradesh, India

**Methods:** There were a total of 323 COPD cases and 325 controls which were taken from the patients attending the department of Medicine of BMC. The diagnosis was made by using the standard clinical criteria and was confirmed by spirometry, chest X-ray and Computed Tomography thorax as and when required. A detailed clinical history regarding age, sex, residence, smoking and type of cooking fuel used at home was taken by using predesigned questionnaire.

**Results:** This study shows that proportion of male was higher in case group than in controls. Large percentage of cases of COPD had history of smoking as compared to controls. Mean pack-years of COPD patients was higher as compared to controls.

**Conclusions:** Exposures to active smoking and environment tobacco smoke (ETS) both were found as important risk factors for COPD. Of the other important risk factors were exposure to solid fuel smoke at home mainly in females.

**Keywords:** COPD, ETS, Smoking

### INTRODUCTION

Chronic obstructive pulmonary disease (COPD) is a disease which is characterized by irreversible limitation in airflow. First kind is emphysema, in which there is destruction and enlargement of lung alveoli. Second is chronic bronchitis, presenting with chronic cough & phlegm; and third variety is small airway disease, in which small bronchioles are narrowed.<sup>1</sup>

Chronic obstructive pulmonary disease is the fourth largest cause of death in the world.<sup>2</sup> As per WHO, COPD accounts for the death of more people than HIV-AIDS,

Malaria and Tuberculosis all put together in the Asia. COPD is a remarkable health problem in India in terms of morbidity and mortality. Because of the lack of uniform diagnostic criteria its prevalence is underestimated.

As per a report published by the National Centre for Macroeconomics and Health, an economic loss of about Rs 35,000 crores is suffered by India due to COPD.<sup>3</sup> It is a challenge to curb the growing burden of COPD. Hence focus on the prevention of development of COPD becomes most crucial to reduce the burden of COPD. In this prospective we need to identify the various risk factors that lead to the development of COPD. With this

in mind, this study was done to understand the role of risk factors such as the biomass fuel combustion, tobacco smoking and other environmental exposures for occurrence of COPD.

**METHODS**

This case control study was carried out at Bundelkhand Medical College and associated hospital Sagar. The COPD cases attending to the Department of Medicine between October 2014 to July 2015 were included in this study. Patients aged ≥ 35 year were included in the study. We used the standard criteria for diagnosis. For chronic bronchitis, presence of cough with expectoration for more than three months in a year for the past two or more years excluding other causes of chronic cough with expectoration.

Confirmation was done by spirometry, chest X-ray and non-contrast computed tomography (NCCT) thorax as and when required. Suitable matching controls were selected. Informed consent was obtained and a detailed history of each patient was taken. Variables that were

considered used for analysis included the age, gender, usual place of residence, smoking habits and the type of cooking fuel combustion at home. The presence of regular smoking of any type i.e. cigarettes and bidis, for one year or more was taken as smoker. If there was a regular history of cooking fuel combustion at home for more than one year then exposure to cooking fuel combustion was considered positive. Cooking fuels used at home were liquefied petroleum gas (LPG), kerosene, or the solid fuels i.e. coal, dried wood, dung and biomass fuels. Data collected was analyzed by using SPSS software- 17 version. We used chi square tests for categorical variables for analyzing the differences in baseline characteristics.

**RESULTS**

In this study, a total of 323 cases and 325 controls have been studied who were almost of similar ages. A slightly higher percentage of cases (38.4%) were of age group 35-40 year as compared to controls (31.4%). The percentage of male amongst the cases was higher (64.4%) than amongst controls (54%) (Table 1).

**Table 1: Features of cases of COPD patients and control subjects.**

	Cases		Controls		Total		
	N	%	N	%	N	%	
Age group	35-50 years	124	38.4%	102	31.4%	226	34.8%
	51-60 years	107	33.1%	117	36.0%	224	34.6%
	61-70 years	92	28.5%	106	32.6%	198	30.6%
Sex	Male	208	64.4%	176	54%	384	59.2%
	Female	115	35.6%	149	46%	264	40.8%
Total	323	100%	325	100%	648	100%	

**Table 2: Smoking history of COPD cases and control.**

	Cases		Controls		Total		X2, P-value
	N	%	N	%	N	%	
Never smoker	56	17.3%	96	29.5%	152	23.4%	X2=14.6, df=1, p<0.001
Ex-smoker	96	29.7%	93	28.6%	189	29.1%	
Present smoker	171	52.9%	136	41.8%	307	47.3%	
Mean pack year	26		14		20		
Total	323	100%	325	100%	648	100%	

History of smoking was found in 29.5% of controls and in 17.3% of cases. Of the cases 29.7% were ex-smoker and 52.9% present smokers were as in the controls 28.6% were ex-smoker and 41.8% present smokers. In significantly greater percentages of cases of COPD there was history of smoking as compared to controls. (X2 = 14.6, df=1, p= <0.001). COPD patients had smoked greater mean pack-years (26) as compared to controls (14) (Table 2).

History of exposures to environment tobacco smoke (ETS) was significantly greater among COPD patients (53.8%) than in control subjects (36.3%), (X2= 20.2, df=1, p=<0.01). Present exposures to ETS, both at home and work were found more among COPD patients than in control subjects. The differences were not statistically significant for current history of ETS at work (X2= 1.16, df=1, p=>0.05). History of exposure to solid fuel smoke at home was found more among COPD patients (47.4%) than controls (32.6%) (X2= 14.7, df=1, p=<0.01).

**Table 3: Comparison of history of exposure of dust, environment tobacco smoke (ETS) among COPD cases and controls.**

		Cases		Controls		Total		X <sup>2</sup> , p-value
		N	%	N	%	N	%	
History of ETS	Yes	174	53.8%	118	36.3%	292	45.1%	X <sup>2</sup> =20.2, df=1, p<0.01
	No	149	46.1%	207	63.7%	356	54.9%	
Present exposure of ETS at home	Yes	109	33.7%	83	25.5%	192	29.6%	X <sup>2</sup> =5.23, df=1, p<0.05
	No	214	66.3%	242	74.5%	456	71.4%	
Present exposure of ETS at work	Yes	78	24.1%	67	20.6%	145	22.4	X <sup>2</sup> =1.16, df=1,p>0.05
	No	245	75.8%	258	79.4%	503	77.6%	
Exposure to solid fuel smoke at home	Yes	153	47.4%	106	32.6%	259	39.9%	X <sup>2</sup> =14.7, df=1, p<0.01
	No	170	52.6%	219	63.4%	389	60.1%	
Total		323	100%	325	100%	648	100%	

## DISCUSSION

This study shows that percentage of males (64.4) was significantly higher in the cases than controls (54%). This is in accordance with the study of S. K. Jindal who reported that COPD is clearly more common amongst men<sup>4</sup>. In this study, study found that a higher percentage of cases of COPD had history of smoking as compared to controls. This study found that 82.7% of COPD patients were smokers while in controls it is 70.5%. Cases had smoked higher mean pack-years (26) as compared to controls (14). This study shows that smoking is a major risk factor for COPD like other studies.<sup>5-7</sup>

In this study, study found significantly higher exposures to environment tobacco smoke (ETS) among cases than in control. It is widely accepted that active smoking is the most important independent risk factor for the development of COPD. This study shows environmental exposure to tobacco also to be important risk factor for development of COPD. Current results from the European Community Respiratory Health Survey have shown that adult pulmonary function and susceptibility to COPD were impart determined early in life.<sup>8</sup>

Exposure to solid fluid smoke and dust was also more prevalent among cases than control subjects. Same finding was also reported by Johannessen A et al in their study.<sup>9</sup>

## CONCLUSION

Tobacco smoking as well as the ETS exposures are important risk factors for COPD. Exposure to solid fuel smoke at home was also found to be an important risk factor in this study.

*Funding: No funding sources*

*Conflict of interest: None declared*

*Ethical approval: The study was approved by the institutional ethics committee*

## REFERENCES

1. Reilly JJ, Silverman EK, Shapiro SD. Chronic obstructive pulmonary disease. *Harrisons Principle of Internal Medicine*; 16th edition; 2:1547.
2. Salvi S, Agrawal A. India needs a National COPD Prevention and Control Programme. *JAPI*. 2012;60:4-5.
3. Murthy KJR, Sastry JG. Economic burden of chronic obstructive pulmonary disease: NCMH Background Papers- Burden of Disease in India; 2005:251.
4. Jindal SK. COPD: The Unrecognized Epidemic in India. *Supplement JAPAI*. 2012;60:4-5.
5. Global Initiative for Chronic Obstructive Lung Disease. Global strategy for the diagnosis, management and prevention of chronic obstructive pulmonary disease. Updated. National Institutes of Health, National Heart, Lung, and Blood Institute; 2003:16.
6. US Department of Health and Human Services. The health consequences of smoking: A Report of the Surgeon General, Atlanta, GA: US Department of Health and Human Services, CDC, Office on Smoking and Health; 2004.
7. Reddy KS, Gupta PC. Report on Tobacco Control in India. Ministry of Health and Family Welfare, Government of India. New Delhi; 2004:99.
8. Svanes C, Sunyer J, Plana E. Early life origins of chronic obstructive pulmonary disease. *Thorax*. 2010;65:14-20.
9. Johannessen A. Association of exposure to environmental tobacco smoke in childhood with chronic obstructive pulmonary disease and respiratory symptoms in adults. *Respirol*; 2012;17:499-505.

**Cite this article as:** Pandey R, Pandey S. A case control study in BMC Sagar to assess the risk factors of COPD. *Int J Adv Med* 2017;4:1155-7.