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A Study to Find Out the Proportion of Smokers among Patients Hospitalized With Respiratory Complaints, In a Tertiary Care Hospital in South India

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Abstract: **Introduction: The prevalence of smoking is rising in all developing countries, a trend seen in India also. Tobacco is killing around 3 million per year now, and the figure is expected to rise to almost 10 million per year by 2030. The average loss of life among smokers is around 8 years and respiratory morbidity is the most serious and common among all the health problems due to smoking. Materials and Methods: A case-control study was done during November and December of 2014, at a tertiary care teaching hospital in South Kerala. Cases were those adult patients who were admitted for respiratory complaints in General Medicine and Pulmonary medicine wards while controls were sex matched adult patients who were admitted for gastrointestinal complaints in the General Medicine or Gastroenterology wards. Results: There were 42 cases and 42 sex-matched controls in the study. Among the cases, 15(35.7%) were current smokers, 23(54.8%) were ex-smokers and 4(9.5%) were non-smokers, while among the controls a vast majority (28, 66.7%) were non-smokers. Among the cases, majority (37, 88.1%) were admitted for Chronic Obstructive Pulmonary Disease (COPD), while the others had hemoptysis due to some cause and lower respiratory tract infection as their treating diagnoses. Smokers were 19 times more likely to get admitted in a hospital due to respiratory complaints when compared to non-smokers. (OR-19.0, 95% CI- 5.6 to 63.9). Discussion and conclusions: This study points to towards the need to control the availability and use of beedis and cigarettes in the country. The governmental effort in this regard has to be stepped-up and programmatic flaws should be addressed.**

Keywords: **MeSHterms Smoking/adverseeffects*, Case-ControlStudies, India, India/epidemiology.**

I. INTRODUCTION

A substantial proportions of the adult population in India are current smokers or past smokers and the quit rates have been low in spite of the aggressive anti-tobacco strategies employed by the successive governments. (1) In a large cross-sectional study done in Delhi during 1985-86, it was found that 45% (95% confidence interval 43.8 to 46.2) of men and 7% (6.4 to 7.6) of women were smokers. Also, it was found that poor education and male sex was the strongest predictor of smoking. Among smokers, almost half of them smoked cigarettes and the rest smoked beedis, those with poor incomes and lower education were more likely to smoke beedis than cigarettes. (2) A similar study done in Delhi and surrounding areas during the last decade showed a lower prevalence of smoking, 28.5% of males and 2.1% of females were ever smokers. Cigarette smoking was more common in urban areas while beedi was the more popular form in rural areas. Increasing age, low socio-economic status and rural residence were important factors associated with smoking. (1) The national sample survey of 1995-96 gives the most comprehensive data on the prevalence of tobacco usage in India. The prevalence of smoking was estimated to be 16.2%, and that of tobacco chewing to be 14%, among people above 10 years of age. Men were almost 25 times more likely to report smoking and 3.7 times likely to chew tobacco when compared to

women. (3) In the state of Kerala also, the prevalence of tobacco usage is similar to the national averages, even though other health indicators are much better than the national statistics. Smoking is the most common form of tobacco usage in Kerala and poor socio-economic status is the most important predictor for smoking. Mortality and morbidity due to tobacco is maximum among the poorest people in the state. (4)

The association of smoking with multiple health problems are well known. In developed nations, tobacco smoking is responsible for 24% of all adult male deaths and 7% of adult female deaths. The average loss of life among smokers was around 8 years. Tobacco is killing around 3 million per year now, and the figure is expected to rise to almost 10 million per year by 2030. Most of the mortality will occur in developing countries where the use of tobacco in any form is rising to alarming levels. (5) Respiratory morbidity is the most serious and common among all the health problems due to smoking. Smoking can directly or indirectly cause a wide range of respiratory illnesses like malignancies of the respiratory tract, chronic obstructive pulmonary disorder, and chronic bronchitis. Those smoking beedis were more likely to develop these respiratory illnesses as compared to those smoking cigarettes. (6) Also, smokers are more likely to develop tuberculosis and other lung infections and are more likely to die from these causes as compared to non-smokers. In a case control study done in Chennai, it was found that the proportional excesses of respiratory, vascular, and neoplastic mortality at ages 25-69 years among ever smokers, was much higher when compared to non-smokers. (7) Smoking poses a significant risk factor for developing lung malignancies. In a case control study from Thiruvananthapuram, Kerala, cigarette smokers were 4.54 (95%CI=2.96-6.95) times more likely to develop lung malignancies as compared to non-smokers while beedi smokers were 6.45 (95%CI=4.38-9.50) times more at risk for the same as compared to non-smokers. Again, this shows that beedi smoking is more harmful when compared to cigarette smoking and the risk for health problems are much higher. (8) The data from a community cohort established in Karunagapally, Kerala shows similar findings. Currents beedi smokers are 4.6 (95%CI = 2.5-8.5) times at risk for developing lung cancer when compared to non-smokers and lung cancer risk did not return to the level of non-smokers even after 10 years of smoking cessation. Younger age of starting smoking, longer duration of smoking and number of beedis per day have a significant association with cancer incidence. (9) Smoking also plays a huge role in development of chronic obstructive pulmonary disease, as found out in multiple studies across the world. In a multicentric study done in Bangalore, Chandigarh, Delhi and Kanpur, the prevalence of COPD in general population was found to be 4.1%, with smokers being 2.65 times more likely to develop the same. Environmental tobacco smoke was also a significant risk factor for developing COPD in non-smokers. (10)

This study was done to find out the proportion of smokers among those admitted for respiratory complaints, in general medicine and pulmonary medicine wards of a tertiary care hospital in South Kerala.

II. MATERIALS AND METHODS

The study was done during November and December of 2014, at Pushpagiri Medical College Hospital, Tiruvalla which is a tertiary care teaching hospital in South Kerala. A case-control study was done by taking patients admitted in General Medicine, Pulmonary medicine and Gastroenterology wards of the hospital. Cases were those adult patients who were admitted for respiratory complaints in General Medicine and Pulmonary medicine wards while controls were sex matched adult patients who were admitted for gastrointestinal complaints in the General Medicine or Gastroenterology wards.

Assuming a significance level of 5% and a power of 80%, expected proportion of smokers among those admitted with lung diseases to be 40% and among those admitted with gastrointestinal diseases to be 15%, the sample size was 42 cases and 42 controls. Convenience sampling was done till the sample size was achieved. Seriously ill patients, those on assisted ventilation and patients with mono or multi-drug resistant tuberculosis were excluded from the study. A local language translation of an interviewer administered, structured, pilot-tested questionnaire was administered to each participant after taking an informed consent. The questionnaire collected information on use of tobacco, attempts at quitting, respiratory symptoms among cases etc.

III. RESULTS

Forty two patients admitted for respiratory complaints were selected from general medicine and pulmonary medicine wards of Pushpagiri Medical College Hospital and 42 controls were selected from among patients admitted for gastrointestinal complaints in general medicine and gastroenterology wards. All the study participants were males. The mean age among cases was 68.5 years (SD- 8.6 years) and the mean age among controls was 63.8 years (SD- 6.4 years).

Twenty six (61.9%) of the cases and 22(52.4%) of the controls were either unemployed or retired. Among the cases, 15(35.7%) were current smokers, 23(54.8%) were ex-smokers and 4(9.5%) were non-smokers, while among the controls a vast majority (28, 66.7%) were non-smokers. Among the cases, majority (23, 60.4%) of the smokers were beedi users while among the controls, most (8, 57.1%) of the smokers were using cigarettes. A good number (23, 60.5%) of the cases had quit the habit of smoking while 10 (26.3%) attempted to quit but were not successful. A majority (31, 73.8%) of the cases had family members who smoke, while among the controls only few (13, 30.9%) said they have family members who are smokers. Seven (16.7%) of the cases were habitual drinkers while only 2 (4.8%) of the controls admitted regular alcohol consumption. Two-thirds of the cases were exposed to atmospheric air pollution, while only around 45.2% of the controls were exposed to the same. [Table 1]

Table 1: Baseline characteristics

Characteristic/Attribute	Cases	Controls
Occupational status		
Professional	0	1(2.3%)
Semi-professional	1(2.3%)	2(4.7%)
Clerical/Farmer	4(9.5%)	4(9.5%)
Skilled worker	1(2.3%)	0
Semi-skilled worker	1(2.3%)	2(4.7%)
Unskilled worker	9(21.4%)	11(26.3%)
Unemployed/Retired	26(61.9%)	22(52.4%)
Smoking status		
Non-smoker	4(9.5%)	28(66.7%)
Ex-smoker	23(54.8%)	9(21.4%)
Current smoker	15(35.7%)	5(11.9%)
Type of smoke (among current and ex-smokers)		
Cigarette	7(18.4%)	8(57.1%)
Beedi	23(60.4%)	5(35.7%)
Beedi and cigarette	8(21.1%)	1(7.2%)
Family members who smoke		
Yes	31(73.8%)	13(30.9%)
No	11(26.2%)	29(69.1%)
Attempted quitting smoking (among current and ex-smokers)		
Successful	23(60.5%)	9(64.3%)
Not successful	10(26.3%)	1(7.2%)
No attempts so far	5(13.2%)	4(28.5%)
Alcohol consumption		
No	16(38.1%)	24(57.5%)
Occasional	19(45.2%)	15(35.7%)
Habitual	7(16.7%)	2(4.8%)
Exposure to air pollution		
Yes	28(66.7%)	19(45.2%)
No	14(33.3%)	23(54.8%)

Among the cases, majority (37, 88.1%) were admitted for Chronic Obstructive Pulmonary Disease (COPD), while the others had hemoptysis due to some cause and lower respiratory tract infection as their treating diagnoses. Among the controls, Acute Gastroenteritis (16, 38.1%) and Upper Gastrointestinal bleed due to some cause (12, 28.6%) were the most common treating diagnoses. [Table 2]

Table 2: Medical diagnosis in cases and controls

Cases (n=42)	Controls (n=42)
Chronic Obstructive Pulmonary Disease (37, 88.1%)	Acute Gastroenteritis (16, 38.1%)
Hemoptysis (3, 7.1%)	UGI Bleed (12, 28.6%)
Lower Respiratory Tract Infection (2, 4.7%)	Acid Peptic Disease (6, 14.3%)
-	Gastric Malignancy (5, 11.9%)
-	Enterocolitis (2, 4.76%)
-	Crohns disease (1, 2.38%)

Smoking was found to be highly associated with hospitalization due to respiratory complaints. ($p<0.001$) Smokers were 19 times more likely to get admitted in a hospital due to respiratory complaints when compared to non-smokers. (OR- 19.0, 95% CI- 5.6 to 63.9) Also, exposure to air pollution was associated with hospitalization due to respiratory ailments (p-0.04) and people exposed to air pollution were 2.4 times more likely to be admitted in a hospital for respiratory complaints when compared to people who were not exposed to air pollution. (OR- 2.4, 95% CI- 1.0 to 5.8)

IV. DISCUSSION AND CONCLUSIONS

Among the 42 patients who were hospitalized due to various respiratory ailments, 23(54.8%) were ex-smokers and 15(35.7%) were current smokers. This is much higher than the proportion of smokers among those from the control group in which 9(21.4%) were ex-smokers and 5(11.9%) were smokers. This trend is similar to what is observed in studies done around the world in which almost three-fourths of patients admitted for respiratory ailments were smokers. (11) Most of the smokers were using beedis and this may be due to the fact that a majority of participants were unemployed/retired and their purchasing power may not be as good as the general population. Another reason may be that beedis cause more respiratory morbidity than cigarettes and this indirectly causes a higher hospitalization rate among beedi users. This has been seen in multiple other studies which has demonstrated that beedis are much more harmful than cigarettes even when quantities are comparable. (8) The highly significant association between smoking and hospitalization due to respiratory ailments, may be due to the high respiratory morbidity due to smoking. Smoking will predispose the user to develop significant respiratory ailments, when compared to non-smokers and this has been observed in various studies done around the world. (6,10) Almost ninety percent of the cases were patients with COPD exacerbation, this may be because the study was conducted in in the months of November-December which is generally damp and cold in this part of the country. It has been demonstrated from previous studies that COPD exacerbations happen more during the rainy and cold seasons. (12)

This study points to towards the need to control the availability and use of beedis and cigarettes in the country. The governmental efforts in this regard has to be stepped-up and programmatic flaws should be addressed. The tax revenue from tobacco products and the cost of caring for those diseased by tobacco, has to be compared realistically and policies should be based on these objective findings. Further research is needed to find out the prevalence of tobacco usage in this part of the country and the actual health effects of the same.

Conflict of Interest: None

Source of funds: None

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