FREQUENCY OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD) AMONG SMOKERS AND NON-SMOKERS AT HAYATABAD MEDICAL COMPLEX PESHAWAR

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ABSTRACT

OBJECTIVES

The study aimed to determine the frequency of COPD, assess the severity of COPD and identify risk factors contributing to COPD development among smokers and non-smokers at Hayatabad Medical Complex.

METHODOLOGY

This cross-sectional study was done at Hayatabad Medical Complex Peshawar from April to December 2023. Data was collected from patients with COPD after obtaining consent, and an opinion poll was used to collect data about their symptoms and medical history. Data analysis was performed using SPSS 25. Chi-square and logistic regression analyses were conducted.

RESULTS

COPD prevalence was found to be significantly higher among smokers (45%) compared to non-smokers (10%) ($p<0.001$). Smokers exhibited greater severity of symptoms and lung function decline. Comorbid conditions like hypertension were also more frequent in smokers with COPD (30%) versus non-smokers with COPD (5%).

CONCLUSION

The frequency of COPD is more common in males and smokers, specifically those aged 46-60years and working in dirty environments, and most of them were presented with SOB and cough compared to non-smokers in which most of them were female and presented with chest tightness, acute bronchitis, and mucus.

KEYWORDS: *COPD, Smokers, Non-Smokers, Health-Related Problems*

INTRODUCTION

Chronic obstructive pulmonary disease (COPD) is one of the leading causes of illness and mortality in the globe, which often results in early death.[1] COPD is characterized by a persistent restriction in airflow that usually worsens over time and is linked to a heightened chronic inflammatory reaction in the lung tissue and airways when exposed to dangerous particles or gases. The combination of minor airway illness (obstructive bronchiolitis) and parenchymal deterioration (emphysema), the relative presence of which varies from person to person, results in the chronic airflow restriction associated with COPD.[2] With over 3 million fatalities annually, chronic obstructive pulmonary disease (COPD) ranks as the third most common cause of mortality globally. More than 90% of these fatalities have place worldwide in low-income areas.[3] Tobacco smoking is known to be one of the leading causes of COPD, but during the past ten years, some research has shown additional significant variables that may also be closely linked to the disease. Occupational exposure to dust and fumes, history of recurrent lower respiratory tract infections in infancy, history of pulmonary TB, and persistent asthma are some of these variables. Exposure to cooking fuels (resulting from burning wood and other fuels) is another factor contributing to the development of COPD in women in underdeveloped nations.[4] According to epidemiological research, smokers who continue to smoke have a 50% chance of developing COPD in the future. Smokers who start smoking earlier in life also have a higher frequency of COPD.[5] Numerous writers have documented the vital link between smoking and COPD.1-6 According to an analysis of this research, smoking is the primary cause of 75–85% of COPD cases; 15-20% of smokers get COPD.[6] As the population ages, it is anticipated that the number of afflicted people and COPD-related mortality will rise.[7] The World Health Organization estimates that 80 million individuals worldwide have moderate-to-severe COPD out of the more than 210 million people who have the disease overall.[8] The yearly direct expenses of treating COPD are projected to be $29 billion in the United States, making it a significant financial burden on the healthcare system.[9] According to new recommendations, there is currently a lack of information regarding the prevalence of COPD among middle-aged and elderly patients, who are more likely to have the disease.[10] Although there are now no tests that can identify smokers who will get COPD, quitting is strongly advised as the only treatment that can slow

down the progression of the condition. In this situation, incidence studies may be crucial for identifying smokers who are "susceptible" to developing COPD and for clarifying novel risk factors for the illness. This may direct future clinical research and result in the identification of novel pathophysiologic pathways.[11] Epidemiologic and clinical data have supported the biological plausibility of a connection between tobacco use and unfavorable outcomes for the respiratory system for the past fifty years. Smokers have a higher risk of lung cancer, COPD, and other respiratory diseases, including asthma, especially if they have a history of prolonged exposure. The likelihood of harmful respiratory consequences from smoking appears to be influenced by sex as well. The majority of research indicates that smoking negatively impacts women's respiratory function more than it does men's.[12] COPD is more prevalent in males aged 46-60 who smoke and work in dirty environments, often presenting with shortness of breath and cough. In contrast, among non-smokers, predominantly females, symptoms include chest tightness, acute bronchitis, and mucus.

METHODOLOGY

This observational study was conducted at Hayatabad Medical Complex Peshawar from April to July and calculated on Rao soft software collected data from 140 male and female patients. Individuals aged 30 and above, with a history of smoking for at least 10 years and non-smokers who had never smoked, and all participants had to be free of any diagnosed respiratory conditions other than COPD were included. Those individuals with a history of asthma or other chronic respiratory diseases, and cardiovascular or other systemic diseases that could impact respiratory function were excluded. Data was collected through a written questionnaire. The questionnaire comprised 12 marked questions the questionnaire includes basic and essential questions about COPD and different clinical presentations**.** Data were analyzed using SPSS version 25. Descriptive statistics (mean, standard deviation) were computed for continuous variables, while frequencies were calculated for categorical variables. Chi-square tests were used to compare COPD prevalence between smokers and non-smokers. Logistic regression was performed to identify independent risk factors for COPD. A p-value of <0.05 was considered statistically significant.

RESULTS

Table 1: Demographic Characteristics

Variable	Smokers	Non-smokers
Mean Age (years)	52.3 ± 8.5	50.1 ± 9.1
Male (%)	88%	84%
Hypertension (%)	30%	15%
Diabetes Mellitus (%)	12%	10%

Table 2: Prevalence of COPD

Group	COPD Present	COPD Absent	P-Value
Smokers	45%	55%	<0.001
Non-smokers	10%	90%	

Table 3: Severity of COPD among Smokers

Severity of COPD (GOLD Stage)	Smokers	Non-Smokers	P-Value
Mild (Stage I)	30%	60%	0.008
Moderate (Stage II)	45%	32%	
Severe (Stage III)	20%	8%	
Very Severe (Stage IV)	5%	00%	

Table 4: Risk Factors for COPD

Risk Factor	Odds Ratio (OR)	Confidence Interval (CI)	P-Value
Smoking (pack-years)	4.35	2.80 - 6.75	<0.001
Hypertension	1.75	1.10 - 2.60	0.019
Occupational Exposure	2.15	1.50 - 3.05	<0.001

DISCUSSION

The results of this study reveal a significantly higher prevalence of Chronic Obstructive Pulmonary Disease (COPD) among smokers compared to non-smokers at Hayatabad Medical Complex (HMC). Specifically, COPD was diagnosed in 45% of smokers, while only 10% of non-smokers had COPD. These findings are consistent with the global understanding that smoking is the most significant risk factor for COPD, as reported by numerous studies worldwide. A study by Jha et al. observed similar results, with a 40% prevalence of COPD among smokers compared to 8% in non-smokers, emphasizing the profound effect of smoking on lung health (13). The prevalence of COPD in smokers found in our study aligns closely with the Global Burden of Disease (GBD) study, which reported a global COPD prevalence of 43% among smokers.[14] Additionally, the GOLD report notes that 85% to 90% of COPD cases in high-income countries are attributable to smoking, with a slightly lower proportion in developing nations like Pakistan due to the additional impact of environmental factors.[15] Although our study reports a 45% prevalence of COPD among smokers, this is slightly higher than the 30% found in some other regional studies, such as those conducted in India and Bangladesh, where cultural smoking habits and exposure to biomass fuels also contribute to the disease burden.[16] In comparison, non-

smoking-related COPD cases were less common in our cohort, with only 10% of non-smokers diagnosed. This is comparable to the findings of Salvi et al., who reported a 9% COPD prevalence in non-smokers in South Asia.[17] However, it contrasts with studies conducted in European countries, such as a study by Lamprecht et al., which found that approximately 25% of COPD cases occurred in non-smokers.[18] This discrepancy could be attributed to differences in environmental exposures, occupational hazards, and the use of biomass fuels in developing countries, which may result in non-smoking-related COPD.[19] The severity of COPD among smokers in this study also follows trends observed in the literature. Smokers in the study exhibited a higher prevalence of moderate to severe COPD, with 45% and 25% of patients falling into the GOLD Stage II and III categories, respectively. This aligns with findings from a multicenter study in Turkey, where 42% of COPD patients who smoked were classified as having moderate to severe COPD.[8] Similarly, the TORCH study, a large international trial, demonstrated that smokers had a more rapid progression of COPD and were more likely to experience severe symptoms, including frequent exacerbations and hospitalizations, compared to non-smokers.[20] Non-smokers in our study were more likely to present with mild COPD, with 60% falling into GOLD Stage I. This supports findings by Behera et al., who reported that non-smokers often present with milder forms of COPD, likely due to the slower disease progression seen in non-smoker populations.[21] This may be because non-smokers with COPD are often exposed to less intense or chronic environmental irritants, leading to more gradual lung damage than seen with smoking. Our findings are generally in line with studies from other regions of Pakistan. For example, a study conducted by Ahmed et al. in Karachi found that COPD prevalence among smokers was 38%, with a significant correlation between pack-years of smoking and disease severity.[22] This correlation was similarly observed in our study, where the odds of developing COPD increased with the number of pack-years smoked (OR: 4.35, $p<0.001$). This relationship is well-established in the literature, as cumulative tobacco exposure directly contributes to the decline in lung function due to increased inflammation and oxidative stress in the airways.[23] However, the COPD prevalence among non-smokers in Karachi was slightly higher (13%) than in our study, likely reflecting differences in environmental exposures and lifestyle factors between urban and semi-urban populations.[24] Urban environments often have higher levels of air pollution, which can contribute to the development of COPD in non-smokers. In contrast, Peshawar's relatively cleaner air could explain the lower non-smoker prevalence in our cohort. Nevertheless, the consistent association between environmental pollutants and non-smoking COPD across studies reinforces the need for targeted public health interventions.[25] The results of this study underscore the critical need for smoking cessation programs in Pakistan. As seen in the current study and supported by other research, smoking is the primary modifiable risk factor for COPD.[26] Efforts should be made to strengthen tobacco control policies, increase public awareness about the dangers of smoking, and provide smoking cessation support through healthcare systems. In addition, more attention must be given to environmental risk factors, particularly non-smoking populations.

LIMITATIONS

The relatively small sample size and single-center design may limit generalizability. Further multicenter studies are warranted to confirm these findings and explore regional risk factors.

CONCLUSIONS

This study confirms a significantly higher frequency of COPD among smokers compared to non-smokers at Hayatabad Medical Complex. Smoking cessation programs should be prioritized to mitigate the risk of COPD and related complications. Additionally, awareness of environmental and occupational risk factors must be enhanced, particularly in vulnerable non-smoking populations.

CONFLICT OF INTEREST: None

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