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Respiratory Medicine

The Clinical and Spirometric Profiles and Staging of COPD, Asthma in Smokers and Nonsmokers, Bangladesh

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Abstract **Original Research Article**

Objective: In this study our main goal is to evaluate the clinical and spirometric profiles and staging of COPD, asthma in smokers and nonsmokers, Bangladesh. ***Method:*** This cross-sectional study was carried out at Tertiary medical College Hospital, Bangladesh. Where data were collected from July 2019 to June 2020. A total of 332 where 232 smoker having exposure to >10 pack year smoking fulfilling inclusion and exclusion criteria were included and 100 apparently healthy non-smoker also were included as control. ***Results*:** During the study, among smokers, clinically 11 and 5 were diagnosed to have COPD and asthma only and the spirometry also diagnosed these 9 smokers and other 31 smokers more to have COPD and thus diagnose 42 smokers to have COPD. Also, 9 smokers to have asthma. The difference between clinical and spirometrically diagnosis of COPD and asthma were statistically highly significant, 0.001. whereas, among non-smokers. Where among 100 nonsmokers only 2 have COPD and asthma. The value of FEV1 of smokers and non-smokers people were 3.1302 and 3.2450 respectively and their standard deviation were 0.52207 and 0.44162 respectively. This difference in FEV1 value was statistically significant (p value 0. 006. The value of FVC of smokers and non-smokers were 4.0857 and 4.2096 respectively and standard deviations were 1.47849 and 0.50218 respectively. Also, 56% and 50% had mild level of COPD and asthma severity. ***Conclusion:*** For long-term primary care smokers, these findings have major consequences. The advantages may include further reason for spirometry which might open the door to improved targeting due to variations in the appropriate therapy.

Keywords: Spirometric profiles, chronic obstructive pulmonary disease (COPD) and asthma.

INTRODUCTION

Chronic pulmonary obstructive disease (COPD) [1] and asthma [2] are frequent respiratory chronic illnesses linked with high morbidity, mortality, and expense of health care. In 2016, COPD claimed 3 million lives worldwide and is estimated to be the fourth-largest cause of mortality by 2030 [3, 4]. Although a substantial decrease in Asthma death in Australia since 1989, from 964 (standard mortality rate 5.6/100,000 per year) to 447 (1.5/100,000 per year) in 2008, no further improvements were made either in Australia or elsewhere during the previous decade [5].

The clinical presentations of asthma and COPD are comparable; nevertheless, the basic pathophysiological processes and epidemiological characteristics are separate [6]. This makes diagnosis difficult if individuals have both characteristics. They have been proposed "Asthma-COPD overlap (ACO)" in these individuals. ACO was defined on terms of chronic airflow limitations with several major criteria typical for both asthma and COPD in the absence of an alternative de Initiative (GOLD) [7].

In this study our main goal is to evaluate the clinical and spirometric profiles and staging of COPD, asthma in smokers and nonsmokers, Bangladesh.

OBJECTIVE

- To evaluate the clinical and spirometric profiles and staging of COPD, asthma in smokers and non-smokers.

METHODOLOGY

Types of study

- It was a cross-sectional study.

Place and period of the study

- The study place was carried out at Tertiary medical College Hospital, Bangladesh. Where data were collected from July 2019 to June 2020.

Study Population

- A total of 332 where 232 smoker having exposure to >10 pack year smoking fulfilling inclusion and exclusion criteria were included and 100 apparently healthy non-smoker also were included as control. Both male & female were included with age of the study population were from 30 years to 70 years. Patients having heart failure, respiratory failure, bronchiectasis, Tuberculosis, Asthma, malignant disease, CLD, CKD, Connective tissue diseases, DM, Obesity, Neuromuscular diseases were excluded. This exclusion was done by history, through clinical examination and relevant investigations.

METHOD

- Both qualitative and quantitative (Mixed Method) data were collected by using a pre designed questionnaire. The questionnaire was prepared reviewing literature and consulting with medical research experts.

Data Analysis

- All collected data were coding and input in SPSS-25 for further analysis. Both descriptive and inferential statistics done. Descriptive statistics included frequency distribution, percent, mean, standard deviation; graph, tables, figures and inferential statistics.

RESULTS

In table-1 shows age distribution of the patients where most of the patients belong to 36-56 years age group 47.4%, followed by 43.4% cases belong to 15-35 years age group, 7.9% cases belong to 57-77 years age group and 1.3% cases belong to > years age group. The following table is given below in detail:

Table-1: Age distribution of the patients

Age group	%	Mean	St. Deviation
15-35 years	43.4	38.16	13.098
36-56 years	47.4		
57-77 years	7.9		
>77 years	1.3		
Total	100.0		

In figure-1 shows gender distribution of the patients where maximum patients were male. The following figure is given below:

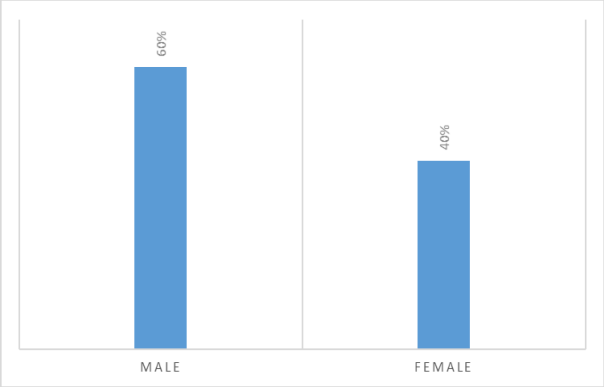

Figure-1: Gender distribution of the patients.

In table-2 shows number of clinically and spirometrically diagnosed COPD cases among smokers. among smokers, clinically 11 and 5 were diagnosed to have COPD and asthma only and the spirometry also diagnosed these 9 smokers and other 31 smokers more to have COPD and thus diagnose 42 smokers to have COPD. Also, 9 smokers to have asthma. The difference between clinical and spirometrically diagnosis of COPD and asthma were statistically highly significant, 0.001. The following table is given below in detail:

Table-2: Number of clinically and spirometrically diagnosed COPD cases among smokers (n=231)

Spirometric diagnosis		Clinical diagnosis			Total	P value
		Normal	COPD	Asthma		
	Normal	180	0	0	180	0.001
	COPD	31	11	0	42	
	Asthma	4		5	9	
	Total	215	11	5	231	

In table-3 shows number of clinically and spirometrically diagnosed COPD cases among non-smokers. Where among 100 non smokers only 2 have COPD and asthma. The following table is given below in detail:

Table-3: Number of clinically and spirometrically diagnosed COPD cases among non-smokers

Spirometric diagnosis		Clinical diagnosis			Total
		Normal	COPD	Asthma	
	Normal	96	0	0	96
	COPD	1	1	0	2
	Asthma	1		1	2
	Total	98	1	1	100

In table-4 shows spirometric values among smokers and non-smokers where the value of FEV1 of smokers and non-smokers people were 3.1302 and 3.2450 respectively and their standard deviation were 0.52207 and 0.44162 respectively. This difference in FEV1 value was statistically significant (p value 0. 006. The value of FVC of smokers and non-smokers were 4.0857 and 4.2096 respectively and standard deviations were 1.47849 and 0.50218 respectively. This difference in FVC value was statistically not significant (p- value 0.804). The value of ratio of FEV1 and FVC among smokers and non-smokers were 78.42.06 and 79.8150 respectively and their standard deviations were 1.9145 and 1.68805 respectively. This difference of value of ratio of FEV1 and FVC among smokers and non-smokers were statistically significant (p-value 0.012). The following table is given below in detail:

Table-4: Spirometric values among smokers and non-smokers

Spirometric indices	Smoker (Mean±SD)	Non-smoker (Mean±SD)	P value
FEV1	3.1302±0.52207	3.2450±0.44162	0.006
FVC	4.0857±1.47849	4.2096±0.50218	0.804
FEV1/FVC	78.4206±1.91495	79.8150±1.68805	0.012

In table-5 shows staging of clinically and spirometrically diagnosed COPD and asthma cases where 56% and 50% had mild level of COPD and asthma severity. The following table is given below in detail:

Table-5a: Staging of clinically and spirometrically diagnosed COPD and asthma cases

COPD severity	%	Asthma severity	%
Mild (FEV1/FVC <0.7, FEV1 ≥80% predicted)	56	Mild persistent	50
Moderate (FEV1/FVC <0.7, FEV1 50-<80% predicted).	23	Moderate persistent	27
Severe (FEV1/FVC <0.7, FEV1 30-<50% predicted).	21	Severe persistent	13

Table-5b: Shows Staging of clinically and spirometrically diagnosed COPD and asthma cases

Diagnostic method	COPD			Diagnostic method	Asthma		
	Mild	Moderate	Severe		Mild	Moderate	Severe
Clinical (followed by spirometry) (n=11)	-	-	11	**Clinical (followed by spirometry) (n=4)**	3	1	-
Spirometrically (n=31)	21	11	0	**Spirometrically (n=5)**	3	2	-

DISCUSSION

In Bangladesh Lung Health Manual it has been shown that prevalence of COPD in Bangladesh in people >40 year of age is 21.24%. Our study has shown 47.4% which was nearer to their finding.

In study Lahore, Pakistan, in 2008, showed that 18% smoker had physical sign of air flow limitation [8].

In our observation among smokers, clinically 11 and 5 were diagnosed to have COPD and asthma only and the spirometry also diagnosed these 9 smokers and other 31 smokers more to have COPD and thus diagnose 42 smokers to have COPD. Also, 9 smokers to have asthma. The difference between clinical and spirometrically diagnosis of COPD and asthma were statistically highly significant, 0.001.

In our study it could be concluded that spirometry can help in early diagnosis of COPD in smokers. One study showed 38% smoker had spirometric diagnosis of COPD among which 18% had mild COPD. 12% had moderate COPD, 8% had severe COPD according to Global initiative for chronic obstructive pulmonary disease severity criteria [9].

Which in our study 56% and 50% had mild level of COPD and asthma severity. So, it can be conclude that spirometry helps for early diagnosis of COPD and asthma in smoker and can uncover a significant number of persons with sign of airflow limitation.

In another similar study conducted by, Pakistan in 2006, spirometric diagnosis of COPD, mild, moderate and severe COPD were 39%, 19%, 12% and 8% respectively which in our study [10].

In another study conducted in Israel showed that only 4% had been diagnosed as COPD prior to spirometry and after spirometry 22% of the smokers were diagnosed as COPD [11]. These results were consistent with those found in our study because in our study.

So, it can be concluded that early detection of COPD is feasible by offering spirometry to individuals with relevant exposure so they are favouring our study in early detection of COPD and asthma among smokers with spirometry.

CONCLUSION

For long-term primary care smokers, these findings have major consequences. The advantages may include further reason for spirometry which might open the door to improved targeting due to variations in the appropriate therapy.

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