

Original Article

Use of CAT score & it's correlation with spirometry in stable COPD patients

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ABSTRACT:

Objective: The Present study is aimed to correlate spirometry with COPD Assessment Test (CAT) score so that later can be utilized in resource limited settings where spirometry is not available. **Methods:** Patients attending medicine OPD already diagnosed with COPD, not in the phase of acute exacerbation were included. Their CAT score was noted and spirometry was done during their visit. **Results:** Out of total 200 patients, 163 (81.5%) were males and 37(18.5%) were females and their mean age was 61 years. The mean CAT score was 22.01, mean FEV₁ (%pred) was 76% and the mean FVC (%pred) was 85%. This study shows a highly negative correlation between CAT score and FEV₁ %pred. (r= -0.96) and between CAT score and FVC %pred. (r= -0.80) which are highly significant (p<0.0001). **Conclusion:** With the decrease in COPD patients FEV₁ and FVC the CAT score increases. CAT score can be utilized to assess severity of COPD even in remote areas where there is no facility for Pulmonary Function Testing.

Key words: COPD, Spirometry, CAT Score.

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INTRODUCTION

Chronic Obstructive pulmonary disease is a respiratory disease characterized by persistent airflow limitation.⁽¹⁾ It is common morbidity leading to hospitalization and mortality that is observed in day to day practice. Globally, COPD is 5th leading cause of mortality and is projected to be at the 4th rank in the year 2030 with estimated 7.8% of deaths due to it because of continued exposure to the risk factors^{(2),(3)}. India has sharp rise in burden of COPD making it rank number 2 only next to China⁽⁴⁾. The diagnostic tool for airflow obstruction in COPD is pulmonary function test⁽⁵⁾. Even those are already diagnosed with COPD, required to do pulmonary function tests for assessing the severity of COPD. However, Pulmonary function tests are not routinely available at Primary Health Centre that contributes to delay in diagnosis and further management. COPD assessment Test (CAT) is regarded as tool for assessing severity of COPD.

The objective of present study is to correlate spirometry with CAT score so that it can be used in resource limited settings where spirometry is not available.

MATERIALS AND METHODS

The present study is a Hospital based cross sectional study. It was carried out at a tertiary care centre in the department of Medicine.

OPD run by department of Medicine follows standard clinical and diagnostic procedures to diagnose and manage COPD patients. The patients once diagnosed with COPD are followed up on regular basis. In the present study patients already diagnosed with COPD were the study participants. Stable COPD patients attending OPD with age 40 years or above and willing to participate were included in the study. The patients experiencing an acute exacerbation of COPD at the time of OPD visit were excluded from the study.

The present study was done between September 2016 and May 2018. Totally 200 patients including males and

females were included in this study only after obtaining informed consent from them. All the participants were subjected to Case Record Form (CRF) which was a standardized questionnaire that intended to capture socio-demographic information, brief history and COPD assessment test (CAT) scores. COPD assessment test is simple tool to assess severity of the COPD. It is 8 item 6 point scale questionnaire with all the items ranked with responses graded on a scale from 0-5 points where 0 denotes no severity and 5 denotes maximum severity⁽⁶⁾.

In the scale, greater discriminant power for milder disease is with items related to cough and phlegm. However, the items chest tightness and confidence leaving home have more discriminant power in severe COPD and the moderate health status impairment is captured by remaining items⁽⁷⁾

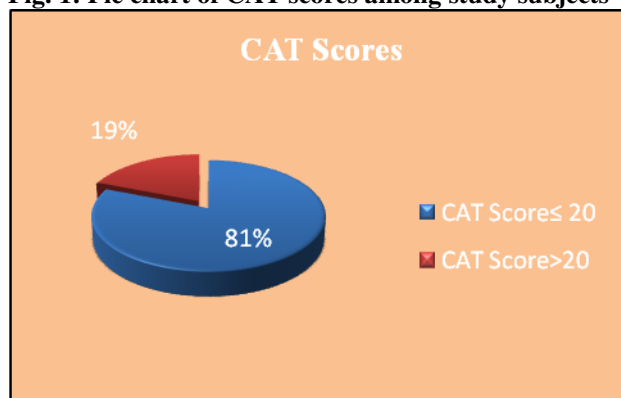
Total score on the scale ranges from 0 to 40. CAT scores assess the severity of COPD patients by categorizing as 1) Low impact- CAT score <10; 2) Medium Impact- CAT score 10-20; 3) High Impact- CAT score 21-30; 4) Very High Impact- CAT score >30⁽⁶⁾.

Data entry and analysis was done using statistical software SPSS 20. Graphical presentation of data is done using Microsoft Office Excel. Socio-demographic profile of the participants is represented as frequency and percentage. Chi square test was applied to study correlation between CAT scores and spirometry findings. Also, correlation coefficient was calculated to study direction of association between them, if any. P value of statistical tests less than 0.05 was considered to be significant.

RESULTS

Out of total 200 study participants 163 (81.5%) were males and 37(18.5%) were females. The age of the subjects ranges from 35 years to 87 years with mean age of 61.45 years. In the present study, the mean spirometric findings of the subjects were observed as 76.15±6.53 for FEV1% predicted and 84.99±7.51 for FVC% predicted. The mean cat scores were observed to be 22.01±2.44. Considering cut off value of 20 points, 19% individuals had CAT scores below or equal to 20 and 81% had CAT scores above 20 as depicted in the fig.1.

Fig. 1: Pie chart of CAT scores among study subjects



Demographic and clinical profile of study subjects is represented in the form of frequency and percentage as in Table 1.

Table 1: Demographic and Clinical Profile of study subject

Parameters		N	Percentage	
1. Age	35-55yrs	57	28.5%	
	56-65yrs	41	20.5%	
	>65yrs	102	51%	
2. Sex	Male	163	81.5%	
	Female	37	18.5%	
3. Smoking	Present	14	7%	
	Absent	186	93%	
4. CAT score	Cough	Score range	N	Percentage
		0-2	36	18%
	3-5	164	82%	
	Sputum	0-2	166	83%
		3-5	34	17%
	Tightness in chest	0-2	70	35%
		3-5	130	65%
	Breathlessness on exertion	0-2	-	-
		3-5	200	100%
	Limitation to Home activity	0-2	28	14%
		3-5	172	86%
	Confidence of Leaving Home	0-2	110	55%
		3-5	90	45%
	Sound Sleep	0-2	170	85%
		3-5	30	15%
	Energy	0-2	89	44.5%
		3-5	111	55.5%
			Mean	SD
5. SpirometryParameters	FEV ₁ % predicted	76.15	6.53	
	FVC ₁ % predicted	84.99	7.51	

Spirometry data i.e. FEV₁ %predicted and FVC %predicted of the individuals were compared with CAT score. Statistically significant difference (p value <0.01) were observed between FEV₁% predicted and CAT scores as well as between FVC% predicted and CAT score. With the decreasing CAT score value there was significant rise in the value of FEV₁% predicted and FVC% predicted as shown in Table 2.

Table 2: Comparison of spirometry data with CAT scores of the patients

Spirometry Parameter	CAT Score		P Value
	≤ 20	>20	
	Mean ± SD	Mean ± SD	
FEV ₁ %pred.	86.47 ± 4.16	75.32 ± 4.30	<0.01
FVC%pred.	95.36 ± 5.41	85.82 ± 5.85	<0.01

In the present study we found negative correlation between CAT score and PFT parameters. The Correlation coefficients of -0.96 and -0.80 were observed between CAT score and the FEV₁ %predicted and FVC %predicted respectively as depicted in table 3.

Table 3: Correlation coefficient between CAT score and Spirometry parameters

Parameter	CAT score	P Value
FEV ₁ %pred.	-0.96	<0.01
FVC%pred.	-0.80	<0.01

DISCUSSION

This is a hospital based cross sectional study conducted on 200 patients attending medicine OPD at tertiary care center. We have recruited patient consecutively it was noted that proportion of male COPD patients were more (81.5%) than that of female(18.5%) which is consistent with the study by S K Jindal et al.⁽⁸⁾

In a study by Daisuke Yoshimoto et al. while comparing two studies noted that the CAT score in COPD patients was significantly higher than in patients without COPD in both studies: 8.6 (95% confidence interval [CI] 7.9–9.2) versus 7.4 (95% CI 7.1–7.6) in study 1, and 8.3 (95% CI 7.5–9.2) versus 6.4 (95% CI 6.0–6.8) in study 2 (both P<0.001)⁽⁹⁾. A study by Hassan Ghobadi et al., there was a significant association between the FEV₁%predicted and total CAT score (r= -0.55) p< 0.001⁽¹⁰⁾. Also NaniDraman et al. reported significant difference between GOLD grades and the mean CAT score, between each GOLD grade⁽¹¹⁾. These studies have results consistent with our findings.

In Present study an inverse correlation was observed between CAT score and FEV₁%pred. which was similar to the findings in a study by Choudhary Sumer et al.⁽¹²⁾

CONCLUSION

Where spirometry is not available CAT questionnaire can be used to assess the severity of COPD.

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