



AN EVALUATION OF FEV₁, 6 MINUTE WALK TEST AND BMI AS SEVERITY INDICATORS AMONG CASES OF COPD

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ABSTRACT

Objectives of the study

To examine whether any correlation exists between spirometric staging of COPD based on post bronchodilator FEV₁, BMI and objective assessment of exercise intolerance by 6 minutes walk test and to correlate the above parameters with the clinical indices of disease severity, lung hyperinflation and pulmonary hypertension.

KEYWORDS: Staging of COPD, FEV₁, BMI and objective, pulmonary hypertension.

MATERIAL AND METHOD

Study area: Study conducted At Peerless Hospital & B. K. Roy Research Centre, Kolkata multi- speciality state-of-art tertiary care hospital in respiratory unit for a cross sectional assessment of the severity of COPD with the help of an elaborate history, clinical examination, spirometry and 6-MWD test, quantifying the days of compromised life suffered by the patient in the last one year due to the disease.

Study population: All adult patients of either sex attending Chest OPD and diagnosed as COPD were considered for the present study.

Sample size & Sample technique: All consecutive patients meeting the eligibility criteria during the study period were enrolled. It was expected from the previous experience that about 47 patients were enrolled.

Data collection technique and tools: Data was gathered on basis of clinical criteria. Patient then assessed by the general examination, 6MWT and compare it with the FEV₁ staging criteria for severity of COPD. Objective clinical parameters such as lung hyperinflation on CXR and evidence of pulmonary hypertension also co related. This data collected was tabulated and analyzed to obtain results and conclusion.

Data analysis

Statistical testing was conducted with the statistical package for the social science system. The various parameters included in the study like FEV₁, FVC, 6-MWD in meters, BMI, Days of Compromised life, dyspnoea grade, spirometric staging were then correlated with each other using the Pearson's correlation coefficient.

1. Salient findings

- The mean age of the COPD patients included in the study was 64.65 years and all subjects were male.
- 42 (89.36%) of the patients included in the study were smokers, indicating a strong relationship of smoking with COPD. 22 (46.80%) of the patients had a history of smoking of more than 20 pack years.
- 38.29% had symptoms for more than 10 years and the mean duration of symptoms was 10.98 years.
- 21 (44.68%) of the patients included in the study were found to be spirometric stage III COPD. 12 cases (25.53%) were in stage II and 14 cases (29.78%) in stage IV. None of the patients included in the study was of spirometric stage I COPD.
- 29 (61.70%) of patients with COPD included in the study had radiological evidence of hyperinflation on chest x-ray either in the form of increased lung length, flattening of diaphragm, areas of hyperlucency or diminished vascular markings in the periphery. 85.71% of patients of stage IV COPD had radiological hyperinflation.
- 9 (19.14%) of patients had ECG or echocardiographic evidence of pulmonary hypertension. 8 (42.85%) of patients of stage IV COPD had pulmonary hypertension.
- The average BMI of the sample studies was 19.24 Kg/m² and most of the patients included in the study (59.57%) belonged to a low socio economic group with an average monthly income of below Rs. 4000/month. 17 (36.17%) of the patients had a BMI of below 18.5 Kg/m² which is the lower cut of limit of BMI for defining malnutrition amongst the Indian population.
- The spirometric staging correlated strongest individually with the Days of compromised life

experienced by the patient with a Pearson's correlation coefficient of +0.339 ($r=0.339$).

- The Spirometric staging of COPD correlated well with the MMRC dyspnoea scale ($r=0.527$).
- Spirometric staging and BMI correlated with each other with a coefficient of -0.323 ($r=-0.323$), showing a fall in BMI with worsening of spirometric grading. The BMI correlated inversely with the Days of compromised life ($r= -0.118$) showing a trend towards increased morbidity with decreasing BMI.
- The 6 MWD and Spirometric staging showed an inverse correlation ($r=-0.297$) showing a falling 6 MWD with a rising spirometric severity of disease. However the 6 MWD correlated weakly with the clinical morbidity index ($r= -0.025$) showing a trend towards increased morbidity with a decreasing 6 MWD which was not significant.
- Perhaps the BMI by itself is not a good indicator of severity of COPD in a population where the prevalence of malnutrition is high. Further studies need to be done to verify how much the prevalence of malnutrition in the elderly population can affect its strength as an indicatory of morbidity in COPD.
- The BODE index correlated positively with the morbidity index used in the study ($r=0.226$).

CONCLUSIONS

This study concluded a direct positive relationship between the morbidity index and the spirometric grading of severity. 6 MWD correlated with the MMRC dyspnoea scale in the study indicating a fall in the 6 MWD with a rise in the MMRC dyspnoea scale. BODE index in patient with COPD compared with the days of compromised life in the last one year as stated by the patient showed that BODE index gave a positive correlation with the index of morbidity used in the study.

Recommendations

- We recommend every COPD patient should undergo spirometry at the time of OPD visit.
- COPD severity should be assessed with different scales at every OPD visit. E.g. BODE Index
- Smoking cessation advice by any method like pharmacological or non pharmacological at every clinical visit.
- Patient diagnosed as COPD, to be given non-pharmacological advice like pulmonary rehabilitation.
- As COPD can cause systemic manifestation, we should assess the extra pulmonary manifestations and measures to be taken to reduce and prevent further complications. Correction of deformity by reduction involves risk of injury to neurological structures. TLIF procedure can restore normal sagittal alignment to some extent without attempt to reductions.