

ORIGINAL ARTICLE

Chronic Obstructive Pulmonary Disease. A Common Disease with Vague Concept among Medicine Trainees

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ABSTRACT

Introduction: The optimal knowledge of medicine trainee residents about utility of spirometry in routine care of chronic obstructive pulmonary disease (COPD) patients is of utmost importance as spirometry is the corner stone for the diagnosis and severity assessment of COPD after which a plan of management can be constructed according to stage of the disease.

Objective: The objective of the study was to assess the existing status of basic spirometric definition and severity staging of COPD among trainee residents.

Methods: A cross-sectional survey of internal medicine trainees participating in the simulated task oriented assessment of clinical skills (TOACS) 2011 course at Sheikh Zayed Hospital, FPGMI Lahore, was carried out. The two written questions in the study questionnaire (data interpretation) were consisted of; defining the presence of COPD by < 70 post bronchodilator FEV_1/FVC ratio and defining severity of COPD according to FEV_1 . The third direct oral question was about the gold standard test for COPD diagnosis. The number and percentages of positive answers were analyzed and positive responses of the participants regarding three questions were compared by chi-square likelihood ratio.

Results: A total of 52 medicine trainees attended the COPD clinical scenario simulated TOACS author's attended station. Among the participants, 17 were FCPS Part II medicine trainees who had completed their training (group A), 21 were FCPS intermediate module trainees having 2-3 years training experience (group B) and 14 (group C) were the first & second year trainees. Only 17.3% (9) could precisely define COPD presence according to the post bronchodilator spirometric FEV_1/FVC ratio of 56% ($< 70\%$), while 9.6% (5) could define COPD severity according to spirometric data (FEV_1 45% predicted consistent with severe COPD) and 19.2% (10) agreed spirometry as gold standard for COPD diagnosis. The association of training duration with basic knowledge about COPD revealed no difference among the three groups (p -value > 0.05).

Key words: Chronic obstructive pulmonary disease, spirometry, trainee residents.

INTRODUCTION:

Chronic obstructive pulmonary disease (COPD) is the fourth leading cause of morbidity and mortality worldwide and the burden of COPD is projected to increase in coming decades due to continued exposure to COPD risk factors and the aging of the world's population.^{1, 2} COPD patients are frequently encountered in most of the medical outdoor and indoor units in our hospitals. According to global initiative of obstructive lung disease, COPD is a common preventable and treatable disease. It is characterized by persistent airflow limitation that is usually progressive and associated with an enhanced chronic inflammatory response in the airways and the lung to noxious particles or gases. Spirometry is recommended in suspected patients as it remains the gold standard for diagnosing COPD and monitoring its progression.² Due to sparse knowledge of doctors and therefore underutilization, spirometry is infrequently used in clinical practice for diagnosis of COPD and this can miss the opportunity of diagnosing and managing COPD according to severity of the disease.^{3, 4}

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METHODS:

A cross-sectional survey of senior and junior internal medicine trainees participating in the task oriented assessment of clinical skills (TOACS) during internal medicine course 2011 at Sheikh Zayed Hospital, FPGMI Lahore, Pakistan was conducted. This course is run every year to help trainees in preparing for their medicine intermediate module or FCPS part II examination through short and long cases and twenty TOACS stations (attended and unattended). Inclusion criteria consisted of all senior trainees registered for the course as well as observer senior and junior trainees. Those who are just observing but not consenting to participate were excluded. At one attended station (examiner sitting and interacting with the examinee), the author kept a simple case scenario of a COPD patient (annexure) with pre and post bronchodilator spirometric values consistent with the diagnosis of severe COPD (post bronchodilator FEV₁/FVC ratio 56% and FEV₁ 45 % predicted). The survey instrument was designed to assess the basic concept of spirometric definition and assessment of severity of COPD. The trainees who were attending the TOACS stations were a small group of 2-3 individuals with senior most trainees answering the questions after reading the case scenario first followed by juniors answering the questions one by one. Five minutes were allotted to read, interpret and answer the scenario by the senior trainee while others were also reading the scenario and in the next 5 minutes, answers of junior trainees were recorded followed by an oral third question. Their answers were collected in written format ensuring confidentiality except the third oral question which was open. Discussion among the trainees during the session was prohibited.

A simple format of data interpretation was maintained in the interest of reducing respondent burden and confidentiality of responses was assured. The two questions in the study questionnaire (data interpretation) were consisted of; defining the presence of COPD by < 70 post bronchodilator FEV₁/FVC ratio and defining severity of COPD according to FEV₁. The third direct oral question was about the gold standard test for COPD diagnosis. The answers of trainees were recorded and the number and percentages of correct answers were analyzed at the end of the session. Positive responses (number and percentage) of three groups regarding three questions asked in data interpretation scenario were compared by chi-square likelihood ratio.

At the end of the simulated examination, a power point presentation about the feedback of their answers and a presentation about spirometric diagnosis and severity of COPD were delivered followed by questions and answers session.

RESULTS:

A total of 52 trainees attended the COPD clinical scenario (data interpretation) simulated TOACS attended station and took part in answering the three questions in the case scenario with a response rate of 100%. Among the participants, 17 were FCPS Part II medicine trainees who had completed their training (group A), 21 were FCPS intermediate module trainees having 2-3 years training experience (group B) and 14 (group C) were the first & second year trainees residents (figure I).

Only 17.3% (9) could precisely define COPD presence according to the post bronchodilator spirometric FEV₁/FVC ratio of 56% (< 70%), while 9.6% (5) could define COPD severity according to spirometric data (FEV₁ 45% predicted, consistent with severe COPD) and 19.2% (10) agreed spirometry as gold standard for COPD diagnosis (figure II).

The association of training duration with basic knowledge about COPD revealed no difference among the three groups (table). In group A, only 3 out of 17 (17.6%) compared to the second group B where 3/21 (14.3%) and group C 3/14 (21.4%) could define the presence of COPD according to post bronchodilator spirometric FEV₁/FVC ratio of 56% (p-value 0.861).

Regarding the second question of defining the severity of COPD, group A positive answer participants were 2 (11.8%), group B 2 (9.5%) and in group C only 1 (7.1%) could precisely

define the presence of severe COPD according to post bronchodilator FEV₁ of 45% predicted (p-value 0.908).

In the oral question of narrating spirometry being the gold standard for COPD diagnosis, all three groups showed comparable results; group A, only 4 (23.5%), group B, 3 (14.3%) and in group C, only 3 (21.4%) trainees accepted spirometry being gold standard for COPD diagnosis (p-value 0.745). Only 5 (9.6%) participants could actually precisely pick up and answer all three questions.

DISCUSSION:

The exact prevalence of COPD in Pakistan is unknown, however, it is suggested that the risk of undetected airflow obstruction in smokers is associated with increasing age and the number of pack per years of smoking.^{4,5} The three typical ways in which patients with COPD present include some patients having minimal complaints attributable to an extremely sedentary life style, others describe chronic respiratory symptoms (e.g. dyspnea on exertion, cough) and finally, some patients present with an acute exacerbation.⁶

Spirometry detects the presence of COPD as well as its severity and is as important in the COPD population as sphygmomanometer in high blood pressure diagnosis and severity.^{2, 5, 6} The lack of spirometry utilization can over or under diagnose this group of patients with a potential for under or over treatment.³

In this study, the lack of basic knowledge about spirometric definition, severity and accepting spirometry as gold standard test for COPD diagnosis among all levels of trainee residents is reflective of poor theoretical and practical knowledge about spirometry. Many medical units are utilizing in house electrocardiogram (ECG) machines, endoscopy services and some have ultrasonography or echocardiography but spirometer which is now a days cheaper than some other medical instruments and can be used in the form of smaller hand held bed side instruments is not used in medical departments. If COPD is diagnosed at an earlier stage, progression can be slowed with pharmaceutical and non drug measures but this is only possible if these patients undergo spirometry.^{5, 8}

The comparison of results of our study with other similar studies is also reflective of poor knowledge of doctors leading to poor utilization of spirometry at different levels and in one study more than 80% of those with COPD diagnosed after spirometry had no previous diagnosis due to lack of spirometry awareness among family physicians.⁸ Another similar study among trainee doctors from Nigeria having 321 participants revealed only 108 (33.6%) reported having adequate knowledge of spirometry.⁹ A Malaysian study was done to ascertain the knowledge and practice of medical officers on spirometry and management of COPD in a medical department of a state hospital. The knowledge of spirometry for COPD evaluation was good among those working in medical department compared to doctors from other departments (100% versus 69%, $P < 0.01$).¹⁰

In the present study, the association of training duration with basic knowledge about COPD revealed no difference among the three groups of medicine trainee residents. It was evaluated that among all senior trainees and junior residents, only 5 (9.6%) could actually precisely pick up all three questions which is reflective of lack of basic theoretical knowledge and is probably also attributable to underutilization of spirometry for COPD diagnosis in tertiary care centers; as trainees are not using this instrument therefore they have least awareness about its utility. Lack of knowledge and underutilization of spirometry leads to under recognition of COPD until the disease has progressed to moderate or severe stages, by which time patient's symptoms have worsened; they have a poor quality of life (QoL) and a rapidly declining condition.^{11, 12}

In the general discussion after the simulated examination session was over, it was observed that most of the trainees were confused about the COPD definition on the basis of definitions of chronic bronchitis and emphysema and were lacking in their concept 'the fixed airflow obstruction' being the hallmark of COPD which is definable on the basis of spirometry. However,

it has been seen that all those who smoke do not develop chronic bronchitis and emphysema and all patients having chronic bronchitis and emphysema do not end up with COPD.^{4,7, 13}

The limitation of the study is the chance of biased response from the junior trainees answering the third oral question which was open unlike the first two answers having written format; however, keeping in view of overall poor responses, it seems highly likely that the state of existing knowledge of spirometric evaluation of COPD definition was low among all three groups.

RECOMMENDATION:

COPD being a common disease having rising incidence globally can be precisely diagnosed according to severity (and thus treated according to diagnostic category) if spirometry is being employed in medical units catering patients with pulmonary diseases. Spirometry is easy to be used at bedside, cheaper and non invasive.

ANNEXURE:

Study Questionnaire (Data Interpretation)

A 50 years male cement shop keeper came to medical OPD with complaints of exertional shortness of breath after he planned for a daily morning walk with a prolonged period of sedentary living. He narrated a history of long standing smoker's cough. He has history of 35 pack years of cigarette smoking. His vital signs and systemic examination was normal except his chest examination which was consistent with slightly reduced intensity of breath sounds bilaterally with sonorous wheezes. His CXR-PA was normal and an office spirometry revealed the following:

Pre Bronchodilator readings:

- FEV₁: 1.7 L (43 % predicted)
- FVC: 3.2 L (80% predicted)
- FEV₁/FVC: 53%

Post Bronchodilator readings:

- FEV₁: 1.8 L (45 % predicted)
- FVC: 3.2 L (80% predicted)
- FEV₁/FVC: 56%

In the light of this clinical scenario:

Q.1: What is the diagnosis on the basis of spirometric findings?

Q.2: What is the severity of disease?

Q.3. What is the gold standard test for the diagnosis of COPD? (Verbally asked question)

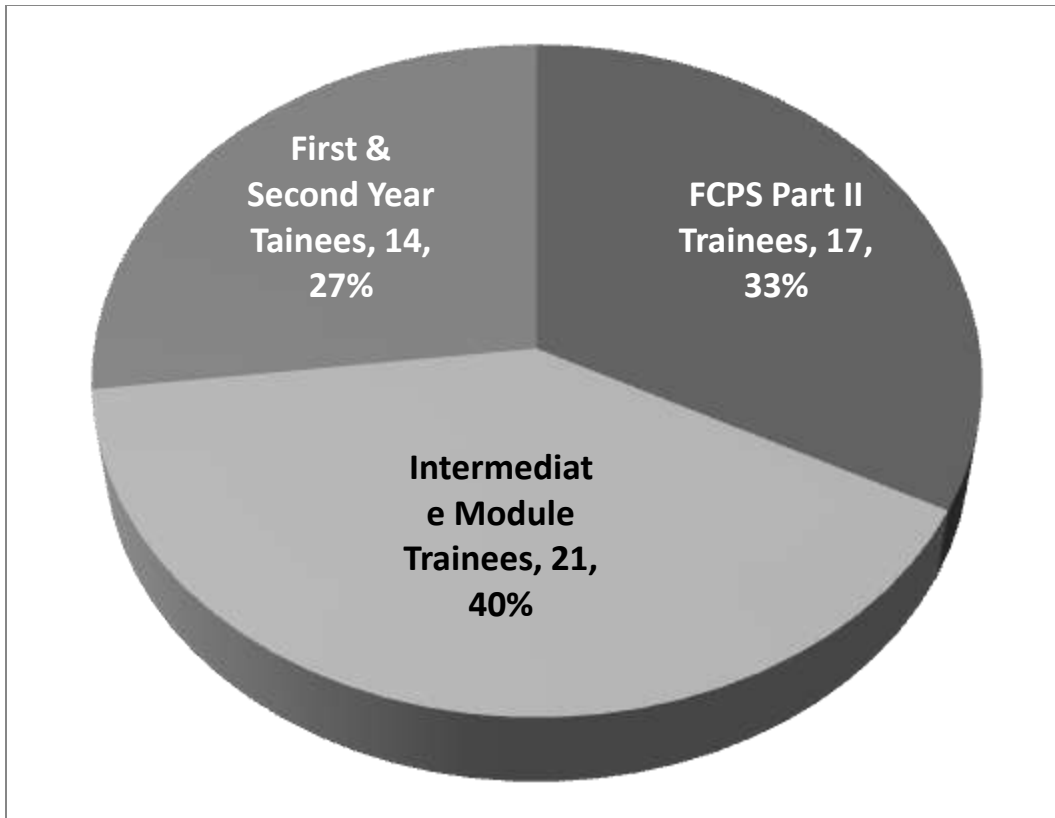


Figure I. Distribution of number and percentage of various participants.

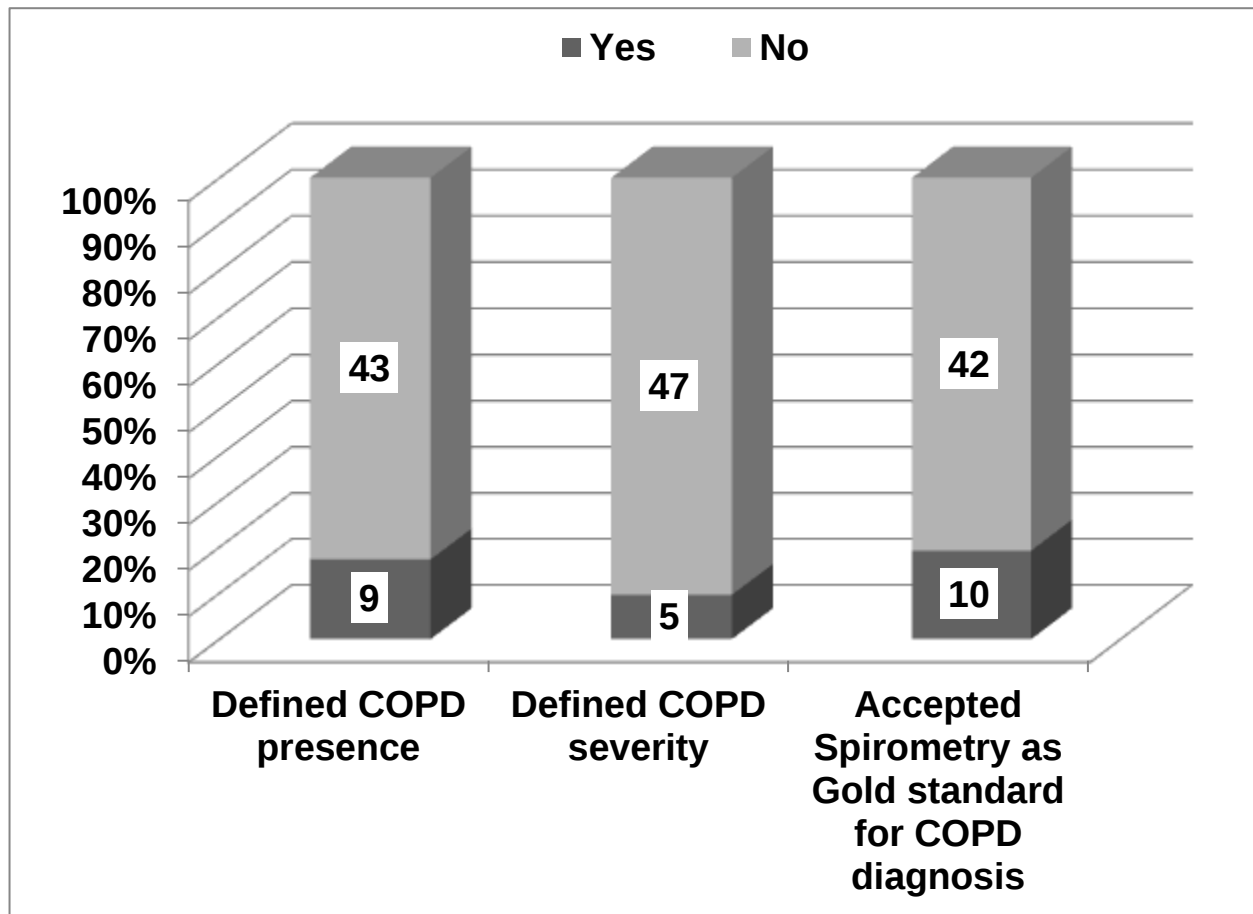


Figure II: Distribution of number and percentage of participants with positive and negative responses to the three questions in the COPD case scenario.

Table I: Comparison of positive responses (number and percentage) of participants' groups regarding three questions asked in the COPD case scenario.

Scenario Questions	Group A n=17	Group B n=21	Group C n=14	P-value
Defined COPD presence	3 (17.6)	3 (14.3)	3 (21.4)	0.861
Defined COPD severity	2 (11.8)	2 (9.5)	1 (7.1)	0.908
Gold standard for COPD diagnosis	4 (23.5)	3 (14.3)	3 (21.4)	0.745

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