

Original Research

Role of spirometry in early detection of chronic obstructive pulmonary disease

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ABSTRACT:

Background: Spirometry is accepted as the diagnostic test to assess airflow obstruction and classify severity of disease. The present study was conducted to assess role of spirometry in early detection of cases of COPD. **Materials & Methods:** 84 patients of chronic obstructive pulmonary disease (COPD) of both genders were enrolled and subjected to spirometry. **Results:** Out of 84 patients, males were 54 and females were 30. FEV1 >80 was present in 53, FEV1 50- 80 in 31, FER <0.7 in 45 and FEF25-75% < LLN in 38. The difference was significant (P< 0.05). **Conclusion:** Spirometry is useful in early detection of chronic obstructive pulmonary disease.

Key words: COPD, Spirometry, FEV

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INTRODUCTION

The prevalence of COPD varies across countries; accurate estimates based on standardised population-based sampling of adults aged 40 and over in 12 sites in the burden of obstructive lung disease (BOLD) survey indicated an overall COPD prevalence (GOLD stage II or higher, FEV1 <80%).¹

Enright et al² in the European Respiratory Monograph, promote office spirometry as the way forward in the routine assessment of asthma and chronic obstructive pulmonary disease (COPD), and in the early detection of COPD. They define office spirometry as 'spirometry performed in the primary care setting'. There is an unwelcome ambiguity in their paper when it comes to both of these subjects, and the evidence they use to support their arguments is far from decisive. In the case of the early detection of COPD, the evidence seems to oppose their position.

Spirometry is accepted as the diagnostic test to assess airflow obstruction and classify severity of disease, based on specific cut points for FER (FEV1/FVC <0.7 after bronchodilator).^{3,4} Flow measurements derived from spirometry such as the forced expiratory flow over the middle half of the FVC (FEF25-75%) and

forced expiratory flow at 75% of the FVC (FEF75%) may be more specific to small airway function, particularly in the presence of a normal FEV1, but they have not proved particularly helpful because they are dependent on the measurement of FVC, lack the repeatability of FEV1, have a wide normal range, and are reduced in the presence of narrowing occurring in proximal airway.⁵ The present study was conducted to assess role of spirometry in early detection of cases of COPD.

MATERIALS & METHODS

The present study comprised of 84 patients of chronic obstructive pulmonary disease (COPD) of both genders. Patients were enrolled after obtaining their written consent.

Data such as name, age, gender etc. was recorded. Spirometry was performed. Parameters such as smoking, BMI, education, allergy history, family history, biomass burning, poor house ventilation etc. was recorded. Forced vital capacity (FVC), forced expiratory volume (FEV1) and total expiratory time was recorded. Results thus obtained were subjected to statistics. P value less than 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Total- 84		
Gender	Males	Females
Number	54	30

Table I shows that out of 84 patients, males were 54 and females were 30.

Graph I Distribution of patients

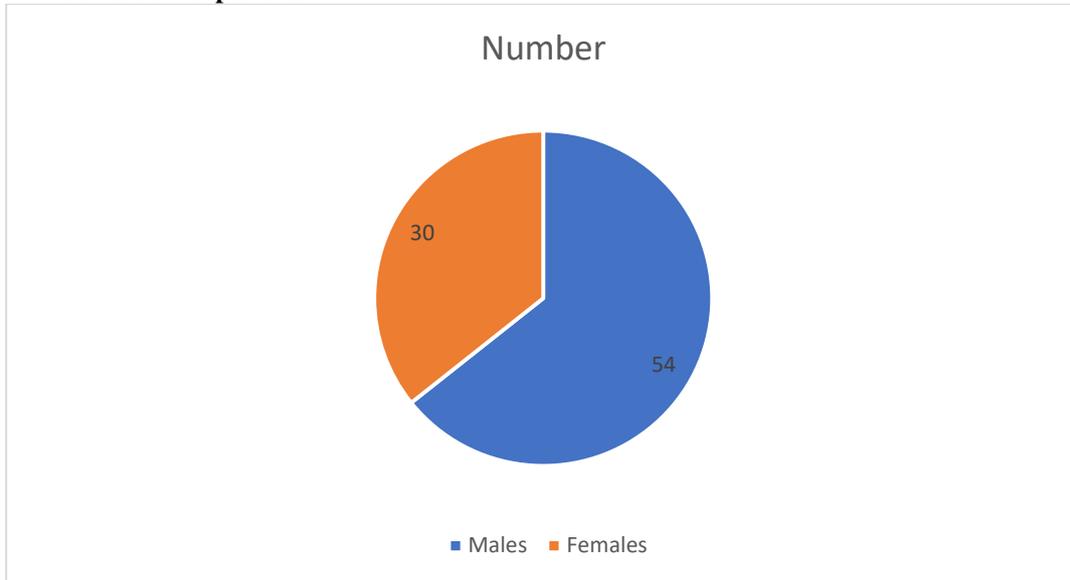
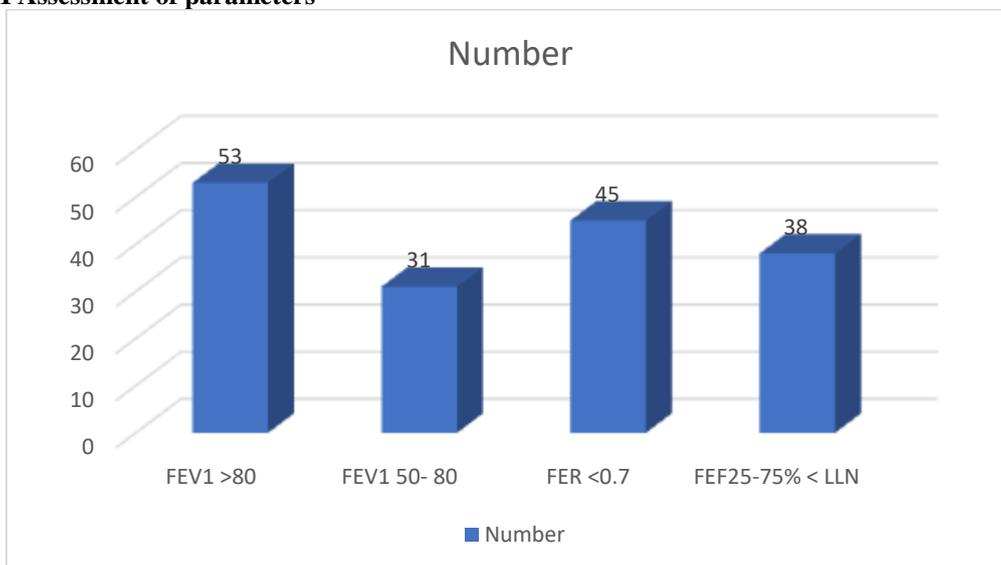


Table II Assessment of parameters

Parameters	Number	P value
FEV1 >80	53	0.04
FEV1 50- 80	31	
FER <0.7	45	-
FEF25-75% < LLN	38	-

Table II, graph II shows that FEV1 >80 was present in 53, FEV1 50- 80 in 31, FER <0.7 in 45 and FEF25-75% < LLN in 38. The difference was significant (P< 0.05).

Graph II Assessment of parameters



DISCUSSION

Current consensus guidelines, such as the Global Initiative for Chronic Obstructive Lung Disease (GOLD) program emphasize the importance of early detection of the disease, even at a preclinical stage.⁶ It is commonly accepted that spirometry is the “gold standard” in the diagnosis of COPD. Until now, only a few studies have been performed on the diagnosis of COPD in general practice, although it appears quite probable that the majority of the patients with unidentified COPD first consult with a general practitioner (GP).⁷ Modern lightweight spirometry instruments that can be wired into a computer are now available. This makes spirometry technically feasible at the primary care level.⁸ Some authors state that mild and even moderate COPD can occur without complaints or symptoms. Moreover, there seems to be a weak correlation between the severity of the complaints and the severity of airway obstruction. In addition, there is a certain underreporting of complaints in subjects with obstructive lung disease (OLD), particularly shortness of breath.⁹ The present study was conducted to assess role of spirometry in early detection of cases of COPD.

In present study, out of 84 patients, males were 54 and females were 30. Buffels et al¹⁰ in their prospective survey of the population aged 35 to 70 years visiting their general practitioner (GP) during a 12-week period, used questionnaire on symptoms of obstructive lung disease (OLD). Spirometry was performed in all participants with positive answers and in a 10% random sample from the group without complaints. Twenty GPs were provided with a hand-held spirometer, and received training in performance and interpretation of lung function tests. All 35- to 70-year-old patients were screened for current use of bronchodilators. The positive predictive power of the questionnaire was low (sensitivity, 58%; specificity, 78%; likelihood ratio, 2.6). One hundred twenty-six cases of formerly unknown OLD were detected in the group of patients with complaints, vs an extrapolated number of 90 in the group without complaints. Despite a negative predictive value of 95% for the questionnaire used, 42% of the newly diagnosed cases of OLD would not have been detected without spirometry.

We found that FEV₁ >80 was present in 53, FEV₁ 50- 80 in 31, FER <0.7 in 45 and FEF_{25-75%} < LLN in 38. In the early stage COPD, airflow obstruction can be present in the absence of symptoms and patients may be quite unaware that their lung function is not normal. Moreover, in smokers, predictive symptoms such as cough and sputum production are frequently attributed by both patients and physicians simply to the common effects of tobacco inhalation, thus masking any underlying chronic pathology. Help is therefore not routinely sought, or offered, until COPD is well advanced and lung function has

deteriorated by 50% or more (i.e. severe or very severe disease).¹¹ If COPD is suspected or likely, spirometry should be used to confirm the diagnosis so appropriate management can be initiated. Early identification of COPD is important as the disease is progressive, so steps to prevent or slow down further deterioration need to be taken as soon as possible. Most cases of COPD are due to smoking, and we agree with recent recommendations that physicians should perform an office spirometry test on all their patients over 45 years old who smoke or have recently quit smoking in order to detect COPD.¹² Office spirometry fulfils all the accepted criteria usually applied to screening tests, being simple and cheap to do, and highly reproducible for an individual patient.

CONCLUSION

Authors found that spirometry is useful in early detection of chronic obstructive pulmonary disease.

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