

A Hospital Based Cross-Sectional Study On Early Detection Of Chronic Obstructive Pulmonary Disease In High Risk Population Using Spirometric Screening.

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Abstract:

Background: Chronic obstructive pulmonary disease (COPD) is projected to be the third leading cause of death by 2020. Its prevalence and burden is expected to rise with rapidly increasing smoking rates in developing countries. This risk factor combined with an ageing population accounts for the actual and forecasted rapid growth in COPD. Spirometry has a role in all three prevention levels. By early detection of COPD in asymptomatic high risk population, it is possible to reduce the disease burden.

Objectives: Early detection of COPD in asymptomatic high risk population by spirometry.

Methods: Patients aged more than 40 years with smoking history more than 10 pack years and not clinically overt symptomatic of COPD were subjected to spirometric study.

Results: The spirometric studies of all 100 asymptomatic cases are analyzed and out of which 61 cases had normal study with FEV1/FVC >70% and 39 cases had obstructive spirometric pattern with FEV1/FVC <70%.

Conclusion: This study concludes that spirometry screening in asymptomatic smokers more than 40 years of age help to detect a number of patients with airway obstruction who are at high risk for COPD and hence by early detection of chronic obstructive pulmonary disease by spirometry especially in high risk group, it is possible to reduce the overall burden of disease.

Date of Submission: 17-03-2018

Date of acceptance: 03-04-2018

I. Introduction

Chronic obstructive pulmonary disease (COPD) is projected to be the third leading cause of death by 2020. Its prevalence and consequent burden is expected to rise with rapidly increasing smoking rates in developing countries. This risk factor combined with an aging population accounts for the actual and forecasted rapid growth in COPD. Overall, the prevalence of COPD in the general population is estimated to be about 1% across all ages, rising steeply to 8-10% or higher in individuals aged 40 years or older¹. In population studies², in which post bronchodilator spirometry was done and with information on previous diagnosis of COPD, findings show consistently that under diagnosis of COPD is high and independent of overall prevalence ($p=0.86$), ranging from 72% in Madrid, Spain to 93% in Montevideo, Uruguay. These estimates of COPD under diagnosis are substantially higher than those reported for high blood pressure, hypercholesterolemia and other similar disorders. Potentially COPD can be prevented at three levels. Primary prevention could be achieved by modification or reduction of the disease main casual risk factor like cigarette smoking or other known risk factors. Secondary prevention could focus on screening or early detection of COPD, which generally entails spirometry, targeting of individual symptoms, or a combination. Tertiary prevention of COPD might include management of identified individuals with COPD to augment health status, reduce or slow disease progression or diminish exacerbations and other adverse outcomes. Spirometry has a role in all three prevention levels. Early diagnosis of COPD can be compared with screening programs for hypertension and hyperlipidemia. To date, for COPD, such evidence is absent for general population improvements in lung function, reduction in exacerbations, or other disease outcomes and endpoints.

II. Objectives

1. To conduct spirometric screening in high risk population of chronic obstructive pulmonary disease.
2. To evaluate the efficacy of the spirometry use in early detection of chronic obstructive pulmonary disease in a high risk population.

III. Methodology

Source of data:

Patients attending General Medicine OPD in Rajiv Gandhi Govt. General Hospital/ Madras Medical College between the period of march 2017 to February 2018.

Sample size: 100

Inclusion Criteria:

1. Age more than 40 years.
2. Smoking history more than 10 pack years.
3. Not clinically overt symptomatic COPD.

Exclusion Criteria:

1. Occupational risk factors of COPD.
2. Associated with other co-morbid respiratory disorders.

Methodology: Patients satisfying the inclusion and exclusion criteria were taken up for the study after obtaining written informed consent. Demographic data, history and spirometry were recorded. During this study period asymptomatic patients with smoking history of more than 10 pack years were subjected to spirometry. Chi-square/Fisher Exact test has been used to find the significance of study parameters on categorical scale between two or more groups, non-parametric setting for Qualitative data analysis.

IV. Results

Smoking pack year distribution of patients studied:

Pack years	No. of patients	%
10-15	9	9%
15-30	72	72%
>30	19	19%
Total	100	100%

Mean±SD:23.18±2.51

FEV1/FVC % distribution of patients studied:

FEV1/FVC	No. of patients	%
<70	39	39%
70-80	14	14%
80-100	47	47%
Total	100	100.0

Mean±SD:92.60±25.96

Pack year distribution of patients studied in relation to Spirometry pattern:

Pack year	Spirometry- Normal Pattern	Spirometry- Obstruction Pattern	Total
10-15	5	4	9
15-30	44	28	72
>30	12	7	19
Total	61	39	100

In our study which aimed to find early detection of COPD in high risk population using spirometric method, we found that it can help to detect a number of patients with airway obstruction who are at high risk for COPD. The spirometric studies of all 100 cases are analysed and out of which 61 cases had normal study (FEV1/FVC >70%) and 39 cases had obstructive spirometric pattern (FEV1/FVC <70%). In 39 cases with airway obstruction spirometric patterns, as per GOLD criteria, 20 cases (51.20%) found to have mild obstruction with FEV1 > 80%, 15 cases (38.4%) had moderate obstruction with FEV1 between 50-80% and 4 cases (10.4%) had severe obstruction with FEV1 between 30-50%.

Compared to another similar study in India by Barthwal MS, Singh S, documented 12.60 % of study subjects had airway obstruction whereas in our study it was 39% of study subjects had airway obstruction³. Compared to another study in similar population by Zielinski J, Bednarek M, documented 24% airway obstruction⁴.

V. Conclusion

This study concludes that spirometry screening in high risk population mainly smokers who are more than 40 years of age helps to detect the airway obstruction early even before the development of symptoms and signs of COPD. Hence by early detection of chronic obstructive pulmonary disease by spirometry screening in high risk group, it is possible to reduce the overall burden of disease.

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Dr. D. Damodaran. " A Hospital Based Cross-Sectional Study On Early Detection Of Chronic Obstructive Pulmonary Disease In High Risk Population Using Spirometric Screening." *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)* 17.3 (2018): 84-86.