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SCREENING FOR CHRONIC OBSTRUCTIVE PULMONARY DISEASE IN PRE-OPERATIVE PATIENTS

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HOW TO CITE THIS ARTICLE:

Chingakhm Debeshwar Singh, Thounaojam Amusana Singh, Rajkumari Bigyabati. "Screening for Chronic Obstructive Pulmonary Disease in Pre-operative Patients". Journal of Evolution of Medical and Dental Sciences 2015; Vol. 4, Issue 50, June 22; Page: 8740-8744, DOI: 10.14260/jemds/2015/1266

ABSTRACT: Chronic Obstructive Pulmonary Disease is a very common Disease often occurring among chronic smokers. Detection of this disease is reliably done by clinical spirometry in patients. The disease is usually under-diagnosed due to poor reporting of symptoms by the patient, difficulty in performing spirometry and under-utilization of this test. Although routine spirometry is useful in chronic smokers to help them in quitting smoking and timely intervention, it is routinely not practiced due to the resource consumed while performing the test, as it requires proper training, patient's co-operation and patience. However, COPD should be screened in pre-operative patients especially with history of smoking, to help detecting asymptomatic cases and assessment of pre-operative fitness for general surgery and anaesthesia. It can avoid intra-operative and post-operative complications in patients. The physician should strongly advise the smokers to quit smoking and treat those detected cases with inhaled ipratropium, inhaled beta 2 adrenergic agonists with or without oral theophylline. Additional oral corticosteroids may be advised for 5 days, for some symptomatic severe COPD patients, before general surgery.

KEYWORDS: Chronic Obstructive Pulmonary Disease, COPD, Spirometry, Screening.

MESHTERMS: Chronic Obstructive Pulmonary Disease, COPD, Chronic Airflow Limitation, Spirometry, Screening, Diagnosis, Postoperative.

INTRODUCTION: Chronic Obstructive Pulmonary Disease is easily detected among symptomatic and asymptomatic patients, using Clinical spirometry. It is a treatable disease characterised by persistent airways obstruction, resulting from inflammatory response to noxious agents like cigarette smoke.⁽¹⁾ It is projected that COPD will cause more than 6 million deaths worldwide annually, and will be third leading cause of death in the world by 2020.⁽²⁾

Its detection in patients before surgery helps the patients to quit smoking and get necessary treatment prior to surgery, hereby improving health and reducing morbidity and mortality from surgery. Smoking cessation is desirable at least 4-8 weeks before surgery.⁽³⁾ The list of post-operative complications of COPD includes lung infections, atelectasis and or increased airflow limitation which all potentially result in acute respiratory failure and aggravation of underlying COPD.⁽⁴⁻⁵⁾ By performing spirometry, COPD can be detected by finding the ratio of the forced expiratory volume in the first second to the forced vital capacity (FEV₁/FVC), measured after administration of inhaled short acting bronchodilator, which is the most reliable test for airflow obstruction.⁽¹⁾

Many authors opine that even though Spirometry is the most useful method for detecting COPD in smokers, it is not advisable to perform the test routinely for all smokers for obvious reasons like excessive resource consumption for the hospital as it requires well-trained technician, correct practice and effort, besides non-availability of spirometry in every OPD set-up. However, in certain situations like check-up for pre-operative fitness and at Reparatory Medicine OPD, it is of immense

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importance. However, spirometry should be used with other pre-operative parameters to assess risk for post-operative complications.⁽⁶⁾ Post-operative pulmonary complications are found higher in severe obstructive Pulmonary Disease undergoing major abdominal surgeries.⁽⁷⁾ To reduce intra-operative and post-operative complications, cases can be treated with ipratropium bromide and beta-2 adrenergic agonist inhalers, 3-4 times a day, with oral theophylline for some.⁽⁷⁻⁸⁾ Selected cases may require systemic steroids for about 5 days.^(1,9,10)

MATERIALS AND METHODS: In this study 502 patients referred from various Departments like General Surgery, Ophthalmology and Obstetrics & Gynaecology, aged above 50 years and with history of smoking were subjected to spirometry test, as per GOLD guideline. The criteria laid down by GOLD were followed for diagnosis of Chronic Obstructive Diseases. Ratio of the Forced Expiratory Volume in the first second to the Forced Vital Capacity (FEV1/FVC) is the most reliable Spirometry test performed after administration of a short acting bronchodilator, for detection of airflow obstruction.

The study was conducted at the Department of Respiratory Medicine, JNIMS, Imphal, Manipur, among patients referred from various surgical Departments of the institute for checking fitness for surgery and general anaesthesia. Among those patients, 502 patients who were chronic smokers and above the age of 50 years were selected. Those who were not fit for spirometry were excluded in the study. The patients were properly explained about the procedure prior to the test, if necessary many times. Pre and post bronchodilator spirometry was performed in these patients, using inhaled salbutamol (400µg) by a Multi dose inhaler with spacer, as bronchodilator.

Study Period: The study was conducted from April 2013 to March 2015.

Sample Size: A total of 502 patients were included in the study.

Inclusion Criteria: All patients of both sexes, who were chronic smokers and referred to the Department of Respiratory Medicine, for fitness for general surgery, were included.

Exclusion Criteria: Those who were not fit for Spirometry and those with recent eye surgery, recent Myocardial Infarction or unstable angina, haemoptysis, acute vertigo, pneumothorax, active Pulmonary Tuberculosis and recent cerebro-vascular accidents were excluded from the study.

RESULTS: Out of the 502 patients of age above 50 years, 310(62%) were found to be having COPD. Among them 62(12%) did not have any respiratory symptoms like cough or breathlessness.

Among the 502 patients screened, 310 were found to be having COPD, fulfilling GOLD's criteria for COPD, having FEV1/FVC < 0.70.⁽¹⁾

Total number of patients	Total Patients with Symptoms of cough +/- dyspnoea	Total Patients without Symptoms of cough +/- dyspnoea
502 (100%)	440 (88%)	62 (12%)
Table 1: Patients with symptoms		

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Total 310 COPD patients			
Cough+/- dyspnoea		Chest X-ray finding of hyperinflation	
Present	Absent	Present	Absent
270(87%)	40(13%)	260(84%)	50(16%)

Table 2: COPD patients with X-ray finding and Symptoms

COPD Patients	Number with Percentage	GOLD grade of COPD severity
Total Number of COPD patients	310 (100%)	Grade 1+2+3+4
FEV ₁ ≥ 80% of predicted	75 (24%)	Grade 1
50% ≥ FEV ₁ < 80% of predicted	231 (75%)	Grade 2
30% ≥ FEV ₁ < 50% of predicted	4 (1%)	Grade 3
FEV ₁ < 30% of predicted	0 (0%)	Grade 4

Table 3: COPD patients with grades of severity

DISCUSSION: The study was intended to show the role of spirometry in screening for Chronic Obstructive Pulmonary disease among patients referred for pre-operative medical check-up. Among a total of 502 referred patients, 310(62%) had COPD as their FEV₁/FVC was less than 0.70. Further, of the 310 COPD patients, number of patients without any symptoms like cough with or without breathlessness was 40(13%) and those without any chest X-ray finding of hyperinflation were 50(16%).

This study shows that detection of COPD cannot be totally based on Clinical symptoms like cough and dyspnea.⁽¹¹⁻¹³⁾ Smokers with chronic bronchitis give history of cough for at least 3 months of a year, for 2 consecutive years. But, not all chronic bronchitis patients have COPD. Further, many patients of COPD may not have Chest X-ray finding like signs of hyperinflation such as intercostal widening, horizontally placed ribs and flattening of dome of diaphragm, which was not seen in all the patients.⁽¹⁴⁾ Hence clinical spirometry must be advised in all pre-operative patients with history of chronic smoking. This will help patients to quit smoking in time and reduce post-operative complications.

Some authors give the opinion that routine clinical spirometry for all smokers is resource consuming and not advisable. But, spirometry definitely is helpful in helping smokers to quit early when Airflow limitation is detected in them by spirometry and increases awareness about COPD thereby preventing its development.⁽¹⁵⁾ It also help to learn the baseline FEV₁, thus monitoring the progress of the disease.⁽¹⁾ Hence, spirometry along with other clinical parameters, guides treating doctors in detecting and management for COPD patients to reduce post-operative complications. Further, it is quite logical for poorly reversible disease like COPD, that earlier detection before symptoms occur is desirable, knowing the fact that it is a common practice to diagnose this disorder mostly symptom- based and there is under reporting of symptoms by patients.

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Date of Submission: 29/05/2015.
Date of Peer Review: 30/05/2015.
Date of Acceptance: 15/06/2015.
Date of Publishing: 22/06/2015.