ORIGINAL ARTICLE

A PROSPECTIVE STUDY OF PULMONARY ARTERIAL HYPERTENSION IN CHRONIC OBSTRUCTIVE PULMONARY DISEASES

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HOW TO CITE THIS ARTICLE:
Y. Saptanaga Kumar, N. B. S. Parimala. "A Prospective Study of Pulmonary Arterial Hypertension in Chronic Obstructive Pulmonary Diseases". Journal of Evidence based Medicine and Healthcare; Volume 2, Issue 16, April 20, 2015; Page: 2379-2383.

ABSTRACT: BACKGROUND: Chronic obstructive pulmonary disease (COPD) is a heterogeneous, multisystem disease with complexities that extend far beyond airway obstruction. **OBJECTIVES:** The purpose of this prospective study is to determine pulmonary arterial hypertension in chronic obstructive pulmonary disease non-invasively. **METHODS:** In this descriptive, prospective, observational, cross sectional study, all patients who presented to the department of Medicine and Respiratory medicine, during this study period of 12 months from January 2013 - December 2014 in Chennai were included. **RESULTS:** Total number of males in the study is 90(90%), females in the study is 10 (10%). Number of patients in the age group 25-35years was 06 (6%), 36-45years was 38(38%), 46-55 years was 30(30), number of patients in 56-65 years was 14 (14) and number of patients in the age group 66-75 years was 12(12). total number of males smoking in the study is 55(61.11%) and total number of non-smokers were 35(38.88), total number of female smoking in the study is 1(10%) and total number of non-smokers were 9(90%). Pulmonary arterial systolic pressure in present study, Mild pulmonary arterial hypertension was seen in 26(26%), Moderate pulmonary arterial hypertension was seen in 54(54%), Severe pulmonary arterial hypertension was seen in 20(20%). **CONCLUSION:** This study shows the prevalence of pulmonary arterial hypertension in COPD patients.
KEYWORDS: Chronic Obstructive Pulmonary Disease, Pulmonary hypertension, airway obstruction.

INTRODUCTION: Chronic obstructive pulmonary disease (COPD) is a heterogeneous, multisystem disease with complexities that extend far beyond airway obstruction.[1]

Pulmonary hypertension is a hemodynamic diagnosis that requires confirmation by right heart catheterization. Pulmonary hypertension in COPD belongs to WHO group 3 or pulmonary hypertension owing to lung diseases or hypoxemia according to the proceedings of the fourth World Symposium on Pulmonary Hypertension at Dana Point 2008.[2]

Mild-to-moderate pulmonary hypertension is a common complication of chronic obstructive pulmonary disease (COPD); such a complication is associated with increased risks of exacerbation and decreased survival. Pulmonary hypertension usually worsens during exercise, sleep and exacerbation. Pulmonary vascular remodelling in COPD is the main cause of increase in pulmonary artery pressure and is thought to result from the combined effects of hypoxia, inflammation and loss of capillaries in severe emphysema.[3]

The hemodynamic definition of pulmonary hypertension related to COPD has been inconsistent in the literature. The current accepted criterion, mean PASP (mPASP) 25 mmHg or more with underlying hypoxic lung disease fails to capture the complexity of this diagnosis in

which vascular remodelling, hypoxia, cardiac co morbidities, and changes in lung mechanics all contribute to elevated pulmonary artery pressures.[3]

Several studies have attempted to define the prevalence of pulmonary hypertension in large cohorts of patients with advanced lung disease. One study evaluating 120 patients with very severe COPD (mean FEV1 27% predicted) using a definition for pulmonary hypertension of a mPASP higher than 20 mmHg found 90.8% of patients had pulmonary hypertension.[4]

Not only is pulmonary hypertension in advanced COPD common but it is also an independent prognostic factor.[5]

A small proportion of COPD patients may present with "out-of-proportion" pulmonary hypertension, defined by a mean pulmonary artery pressure >35–40 mmHg (normal is no more than 20 mmHg) and a relatively preserved lung function (with low to normal arterial carbon dioxide tension) that cannot explain prominent dyspnoea and fatigue. The prevalence of out-of-proportion pulmonary hypertension in COPD is estimated to be very close to the prevalence of idiopathic pulmonary arterial hypertension.[6]

MATERIALS & METHODS:

Study Design: Prospective, observational, cross sectional study.

Sample Size: 100 cases over a span of 12 months from January 2013-December 2014 in Chennai were included who had COPD.

METHOD OF COLLECTION OF DATA: The data for the purpose of the study was collected in a predesigned and pretested proforma which include various socioeconomic parameters like age, sex, occupation, religion, etc. About 100 cases were selected on the basis of the simple random sampling method. Patients who had COPD proven by the pulmonary function test (PFT) at any stage were included.

The statistically data was analyzed with the help of software SPSS.16.0, Chi-square test was done. Questionnaires, physical, radiographic examination was done in all patients.

INCLUSION CRITERIA: Patients with COPD any etiology.

EXCLUSION CRITERIA: Patient who had history wise COPD but no evidence through PFT.

RESULTS: Table 1 shows total number of males in the study is 90 (90%), females in the study is 10 (10%).

Table 2 Number of patients in the age group 25-35years was 06(6%), 36-45years was 38(38%), 46-55 years was 30(30), number of patients in 56-65 years was 14(14) and number of patients in the age group 66-75 years was 12(12). p- value not significant at 0.34.

Table 3 shows total number of males smoking in the study is 55(61.11%) and total number of non-smokers were 35(38.88), total number of female smoking in the study is 1(10%) and total number of non-smokers were 9(90%). p- value significant at 0.001.

Table 4 showing Pulmonary arterial systolic pressure in present study, Mild pulmonary arterial hypertension was seen in 26(26%), Moderate pulmonary arterial hypertension was seen

in 54(54%), Severe pulmonary arterial hypertension was seen in 20(20%). P- value significant at 0.001.

DISCUSSION: The study entitled "A Prospective study of pulmonary arterial hypertension in Chronic Obstructive Pulmonary Disease". Pulmonary hypertension (PH) is an important complication in the natural history of chronic obstructive pulmonary disease (COPD). Its presence is associated with reduced survival and greater use of healthcare resources. The prevalence of PH is high in patients with advanced COPD, whereas in milder forms it might not be present at rest but may develop during exercise.

Scharf et al[7] reported that diastolic dysfunction is a frequent and relevant finding of patients with emphysema. It is questionable whether in COPD patients, elevated pulmonary artery wedge pressure exclusively reflects diastolic left ventricular dysfunction. Air trapping and hyperinflation may increase intrathoracic pressure and, consequently, pulmonary artery pressure and pulmonary capillary wedge pressure. This could be characterized by simultaneously measuring the esophageal pressure. So, measuring oesophageal pressure could also help in characterizing pulmonary artery and pulmonary capillary wedge pressures.

Concomitant pulmonary arterial hypertension associated with collagen vascular disease and even chronic thromboembolic PH has been reported in COPD patients.[8] Due to increasing shunt perfusion, pulmonary vasodilatation could lead to worsening of oxygenation in COPD patients.[9,10]

Our study essentially shows that smoker males are the commonest group of people to present with pulmonary hypertension and also with COPD. Most of the patients in our study patients had moderate to severe pulmonary arterial hypertension as per Dana point classification.[7] the only limitation if this study is Right heart catheterisation, which could not be done in our study. We could have deciphered further more secrets and also correlated our study better with right heart catheterisation and 2D- echocardiography.

CONCLUSION: Pulmonary hypertension is a common finding in patients with advanced lung disease. As with the clinical presentation of COPD in general, pulmonary hypertension in COPD is a heterogeneous disease that can arise from multiple underlying mechanisms. Even 'mild' elevations in pulmonary pressures have been shown to have important consequences for patient morbidity and mortality. Teasing out the underlying causes and clearly defining the type of pulmonary hypertension is critical in making informed decisions about prognosis and therapy.

Group	Number of patients	Percentage (%)
Males	90	90
Females	10	10
Total	**100**	**100**

Table 1: Showing prevalence of present study

Age groups(yrs)	No. Patients	Percentage (%)
25-35	06	6
36-45	38	38
46-55	30	30
56-65	14	14
66-75	12	12
Total	**100**	**100**

Table 2: Showing age and distribution according to groups in present study

Gender	Smoking	Non-Smoking	Total
Males	55	35	90
Females	01	09	10

Table 3: Showing smoking in present study

PASP	No. Patients	Percentage (%)
Mild	26	26
Moderate	54	54
Severe	20	20
Total	**100**	**100**

Table 4: Showing pulmonary arterial systolic pressure in present study by trans thoracic 2D-echocardiography

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ABBREVIATIONS:

COPD - Chronic obstructive pulmonary disease.
PFT **-** Pulmonary function test.
MPASP – Mean Pulmonary arterial systolic pressure.
PH- Pulmonary hypertension.

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Date of Submission: 02/04/2015.
Date of Peer Review: 03/04/2015.
Date of Acceptance: 10/04/2015.
Date of Publishing: 14/04/2015.