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ORIGINAL RESEARCH

Assessment of profile COPD patients with Corpulmonale: An observational study

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ABSTRACT:
Background: The present study was conducted for assessing profile COPD patients with Corpulmonale.
Materials & methods: A total of 50 COPD patients with presence of corpulmonale were included. Complete demographic and clinical details of all the patients were obtained. Patients with history of any other systemic illness or any known drug allergy were excluded. Respiratory functions in all the patients were carried out. Based on assessment of hemodynamic variables, incidence of pulmonary hypertension was also assessed. All the results were recorded and analyzed by SPSS software.
Results: Mean age of the subjects was 58.6 years. 60 percent of the subjects were males while the remaining were females. Mean BMI was 27.1 Kg/m^2. FEV_1 (% pred) was 80.3 while FEV_1/ VC_{Max} was 64.2. FVC (% pred) was 88.2. Mean BNP was 25.9 pg/ml while mean serum creatinine was 0.79 mg/dL. Pulmonary hypertension was seen in 42 percent of the COPD patients with corpulmonale.
Conclusion: Pulmonary hypertension is significantly prevalent among COPD patients with corpulmonale.
Key words: Corpulmonale, COPD

INTRODUCTION

Chronic obstructive pulmonary disease (COPD) is a common and treatable disease characterized by progressive airflow limitation and tissue destruction. It is associated with structural lung changes due to chronic inflammation from prolonged exposure to noxious particles or gases most commonly cigarette smoke. Chronic inflammation causes airway narrowing and decreased lung recoil. The disease often presents with symptoms of cough, dyspnea, and sputum production. Symptoms can range from being asymptomatic to respiratory failure. COPD is caused by prolonged exposure to harmful particles or gases. Cigarette smoking is the most common cause of COPD worldwide. Other causes may include second-hand smoke, environmental and occupational exposures, and alpha-1 antitrypsin deficiency (AATD).Corpulmonale is a Latin word that means "pulmonary heart," its definition varies, and presently, there is no consensual definition.[1- 3]
Corpulmonale can be defined as an alteration in the structure (e.g., hypertrophy or dilatation) and function of the right ventricle (RV) of the heart caused by a primary disorder of the respiratory system resulting in pulmonary hypertension. Right-sided heart failure secondary to left-sided heart failure, or congenital heart disease is not considered corpulmonale. Pulmonary hypertension is associated with diseases of the lung (e.g., chronic obstructive pulmonary disease, interstitial lung disease), vasculature (e.g., idiopathic pulmonary arterial hypertension), upper airway (e.g., obstructive sleep apnea), or chest wall (e.g., kyphoscoliosis). Diseases that damage lungs are autoimmune (e.g., scleroderma), cystic fibrosis, and obesity hypoventilation syndrome are also lead to pulmonary hypertension.[4- 6]
Hence; the present study was conducted for assessing profile COPD patients with Corpulmonale.

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MATERIALS & METHODS

The present study was conducted for assessing profile COPD patients with Corpulmonale. A total of 50 COPD patients with presence of corpulmonale were included. Complete demographic and clinical details of all the patients were obtained. Patients with history of any other systemic illness or any known drug allergy were excluded. Respiratory functions in all the patients were carried out. Blood samples were obtained for assessing presence/absence of any biochemical abnormality. Renal profile of all the patients was also assessed. Based on assessment of hemodynamic variables, incidence of pulmonary hypertension was also assessed. All the results were recorded and analyzed by SPSS software.

RESULTS

Mean age of the subjects was 58.6 years. 60 percent of the subjects were males while the remaining were females. Mean BMI was 27.1 Kg/m^2. FEV_1 (% pred) was 80.3 while FEV_1/ VC_{Max} was 64.2. FVC (% pred) was 88.2. Mean BNP was 25.9 pg/ml while mean serum creatinine was 0.79 mg/dL. Pulmonary hypertension was seen in 42 percent of the COPD patients with corpulmonale.

Table 1: Demographic data

Variable	Number
Mean age (years)	58.6
Males (%)	60
Females (%)	40
Mean BMI (Kg/m^2)	27.1

Table 2: Respiratory variables

Variable	Number
FEV_1 (% pred)	80.3
FEV_1/ VC_{Max}	64.2
FVC (% pred)	88.2

Table 3: Biochemical profile

Variable	Mean	SD
BNP (pg/ml)	25.9	3.1
Serum creatinine (mg/dL)	0.79	0.12

Table 4: Prevalence of pulmonary hypertension

Pulmonary hypertension	Number	Percentage
Present	21	42
Absent	29	58

DISCUSSION

Chronic obstructive pulmonary disease (COPD) is a poorly reversible disease of the lungs that is one of the major causes of morbidity and mortality worldwide. In the United States, it is the fourth leading cause of death after heart disease, cancer, and cerebrovascular disease. Cigarette smoking is the principal risk factor for COPD. However, approximately 1 of 6 Americans with COPD has never smoked. Occupational and environmental exposures to chemical fumes, dusts, and other lung irritants account for 10% to 20% of cases. Individuals with a history of severe lung infections in childhood are more likely to develop COPD.[7, 8]Corpulmonale is a common type of heart disease, as a result of its close association with COPD which has emerged, in recent years, as a leading cause of disability and death. But there are in fact very few data about the incidence and prevalence of corpulmonale. The main reason is that right heart catheterisation cannot be performed on a large scale in patients at risk. An alternative approach is the use of non-invasive methods, particularly Doppler echocardiography. It should be possible to investigate large groups of respiratory patients with echo Doppler within the next few years.[9- 11]Hence; the present study was conducted for assessing profile COPD patients with Corpulmonale.

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Mean BNP was 25.9 pg/ml while mean serum creatinine was 0.79 mg/dL. Pulmonary hypertension was seen in 42 percent of the COPD patients with corpulmonale. The clinical exam lacks sensitivity and specificity. Hyperinflation reduces the yield of cardiac auscultation for the classic signs of PH and CP ie, loud P2, S3 gallop, the systolic murmur of tricuspid regurgitation. Peripheral edema can be present in the absence of right heart failure in COPDand is not diagnostic of corpulmonale. The pathogenesis of edema formation in COPD is complex. Renal blood flow is reduced, the renin-angiotensin system is activated, renal dopamine output is reduced and plasma ANP level is elevated leading to increase in proximal renal tubular sodium reabsorption. Sodium retention is enhanced by hypercapnia and ameliorated by long-term oxygen therapy in hypoxemic patients. True right heart failure is characterized by raised jugular venous pressures, congestive hepatomegaly as well as peripheral edema.[12- 15]

The Global Initiative for Chronic Obstructive Lung Disease (GOLD) guidelines does not recommend the routine measurement of the PAP in patients with COPD. Early studies indicate that, with the exception of low oxygen tensions during exercise and resting hypercapnia, pulmonary function tests are poor predictors of the severity of pulmonary hypertension in COPD. However in a selected group of patients undergoing LVRS the level of PAP varies inversely with the FEV1. Similarly studies of COPD patients without severe hypoxia (PaO2 > 55 mm Hg) have also shown that mPAP better correlates with the FEV1 than with the resting PaO_2. It is also notable that these studies indicating a closer FEV1 PAP relationship were conducted in patients with severe hyperinflation which itself is likely to predispose to PH.[16- 18]

CONCLUSION

Pulmonary hypertension is significantly prevalent among COPD patients with corpulmonale.

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