



## FREQUENCY OF PULMONARY HYPERTENSION IN PATIENTS PRESENTING WITH COPD

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Article Received on 12/08/2018

Article Revised on 03/09/2018

Article Accepted on 24/09/2018

### ABSTRACT

**Objective:** To determine the frequency of pulmonary HTN in cases having COPD. **Methodology:** This was a cross-sectional study that was carried out at Department of Pulmonology, Sheikh Zayed Hospital, Rahim Yar Khan during November 2017 to May 2018. In this study the diagnosed cases of COPD of either gender and age more than 30 years irrespective of its aetiology and severity were selected according to grades of COPD GOLD criteria. The Pulmonary HTN was labelled as yes when resting pulmonary artery pressure (PAP) was more than 25 mmHg. **Results:** In this there were total 100 cases with mean age of 63.67±9.34 years. There were 86 (86%) males and 14 (14%) were females. Pulmonary HTN was seen in 37 (37%) of the cases. There was no significant difference in terms of gender in both groups with p= 0.74. Pulmonary HTN was significantly high in cases that had COPD duration of more than 24 months where it was seen in 34 (44.73%) cases with p= 0.01. It was also significantly high in cases with severe and very severe disease affecting 28 (41.17%) and 7 (38.89%) cases with p value of 0.03. **Conclusion:** Pulmonary HTN is seen in nearly every 3<sup>rd</sup> cases and it is observed significantly high in cases that had severe and very severe disease and also those with duration of disease for more than 24 months.

**KEYWORDS:** HTN, COPD, FEV1.

### INTRODUCTION

The burden of the lung disease is on the rise and is increasing both in the developed and the underdeveloped world due to rise in the trends of pollution and smoking habits. Increased number of vehicles and industries are also amongst the high degree of pollution ending up in wide array of respiratory symptoms and diseases. Obstructive airway diseases like chronic obstructive pulmonary disease (COPD) is one of the most common one.<sup>[1-3]</sup>

COPD is diagnosed on the basis of clinical signs and symptoms of respiratory distress on exertion as well as in static situation depending upon the severity along with cough and sputum and radiological findings of hyper inflated lungs. These are further confirmed on pulmonary function tests (PFTs). It has two major sub types i.e. emphysema and chronic bronchitis.<sup>[4-5]</sup>

COPD can lead to a number of complications like respiratory failure, polycythaemia, pneumothorax, arrhythmias, pulmonary hypertension (HTN) etc.<sup>[5-7]</sup> Pulmonary HTN is seen in around 20-90% of the cases suffering from COPD. Echocardiography is the investigation of choice to label it in terms of mean pulmonary artery pressure (PAP) which is different on

rest and exercise and is normal around 20-25 mmHg and a value more than 25 on rest and more than 35 on exercise is labelled as pulmonary HTN.<sup>[7-8]</sup>

### OBJECTIVES

To determine the frequency of pulmonary HTN in cases having COPD.

### MATERIAL AND METHODS

This was a cross-sectional study that was carried out at Department of Pulmonology, Sheikh Zayed Hospital, Rahim Yar Khan during November 2017 to May 2018. In this study the diagnosed cases of COPD of either gender and age more than 30 years irrespective of its aetiology and severity were selected. The COPD was diagnosed on the basis of signs and symptoms of shortness of breath and cough along with characteristic PFTs findings of obstructive pattern with FEV1 ratio of less than 0.7 and the change in FEV1 of less than 200 ml on nebulization with salbutamol. They were classified according to grades of COPD GOLD criteria. The cases with end stage heart failure and those with connective tissue disorders were excluded from this study. The Pulmonary HTN was labelled as yes when resting

pulmonary artery pressure (PAP) was more than 25 mmHg.

### Statistical analysis

The data was assessed by using SPSS version 22 and post stratification chi square test was applied taking p value less than 0.05 as significant.

## RESULTS

In this there were total 100 cases with mean age of 63.67±9.34 years. There were 86 (86%) males and 14 (14%) were females. Pulmonary HTN was seen in 37 (37%) of the cases. There was no significant difference in terms of gender in both groups with p= 0.74 (table I). Pulmonary HTN was significantly high in cases that had

COPD duration of more than 24 months where it was seen in 34 (44.73%) cases with p= 0.01 as in table II. It was also significantly high in cases with severe and very severe disease affecting 28 (41.17%) and 7 (38.89%) cases with p value of 0.03 as in table III.

**Table I: Pulmonary HTN and gender.**

Gender	Pulmonary HTN		Total
	Yes	No	
Male	31 (36.04%)	55 (58.03%)	86 (100%)
Female	6 (42.85%)	8 (68.43%)	14 (100%)
<b>Total</b>	<b>37 (37%)</b>	<b>63 (63%)</b>	<b>100 (100%)</b>

**P = 0.74**

**Table II. Pulmonary HTN and duration of COPD.**

COPD duration	Pul. HTN		Total
	Yes	No	
< 24 months	3 (12.5%)	21 (87.5%)	24(100%)
>24 months	34 (44.73%)	42 (55.27%)	76 (100%)
<b>Total</b>	<b>37 (37%)</b>	<b>63 (63%)</b>	<b>100 (100%)</b>

**p = 0.01**

**Table III. Pulmonary HTN and severity of COPD.**

COPD severity	Pul. HTN		Total
	Yes	No	
Mild	0 (0%)	1 (100%)	1 (100%)
Moderate	2 (15.38%)	11 (84.62%)	13 (100%)
Severe	28 (41.17%)	40 (58.83%)	68 (100%)
Very severe	7 (38.89%)	11 (61.11%)	18 (100%)
<b>Total</b>	<b>37 (37%)</b>	<b>63 (63%)</b>	<b>100 (100%)</b>

**p value = 0.03**

## DISCUSSION

Cardiorespiratory systems are always connected to each other and the way heart failure affects the lungs, the lungs also leave an impact over the heart via various ways. COPD is an irreversible lung damage leading to an obstructive airway disease and can lead to a wide range of cardiac complications like systolic dysfunction, diastolic dysfunction, arrhythmias, cor pulmonale, pulmonary HTN and hypoxic ischemic injuries etc.

Regarding pulmonary HTN in cases of COPD it was seen in 37 (37%) of the cases. There was a wide variety of the results of the studies done in the past and few revealed lesser and the others higher results as compared to the present study. According to a study done by Roshke et al on cases of COPD expressed that pulmonary HTN was noted in around 80% of the cases; far high as compared to the 37% of the cases in our study.<sup>[2]</sup> A relatively lower but still the higher results were seen in a study by Kurundkar G et al, where it was observed in 53% of cases.<sup>[9]</sup> On further stratification the prevalence of Mild, moderate and severe HTN was seen in 23%, 18% and 12% of the cases respectively.<sup>[9]</sup>

This was in contrast to the study done by Naeji R et al where only 10% of the cases having COPD showed pulmonary HTN.<sup>[10]</sup> The difference in the inclusion criteria and the severity of the cases in the inclusion criteria were the major cofounder detected in these studies.

Pulmonary HTN was significantly high in cases that had COPD duration of more than 24 months where it was seen in 34 (44.73%) cases with p= 0.01 and it was also significantly high in cases with severe and very severe disease affecting 28 (41.17%) and 7 (38.89%) cases with p value of 0.03. These results were also supported by the results of the previous studies where it was seen that these two modalities revealed significant association. This can be explained as they share the common underlying mechanism that longer the duration of the disease and so was seen with higher severity degree and increased likelihood to develop pulmonary HTN.<sup>[11-12]</sup>

## CONCLUSION

Pulmonary HTN is seen in nearly every 3<sup>rd</sup> cases and it is observed significantly high in cases that had severe and

very severe disease and also those with duration of disease for more than 24 months.

## REFERENCES

1. Chaouat A, Naeije R, Weitzenblum E, "Pulmonary hypertension in COPD", *Eur Respir J.*, 2008; 32(5): 1371-85.
2. Roshke K, Orth M, Kushcha M, Dushna HW. Pulmonary diseases and heart function. *Internist (Berl)*, 2007; 48(3): 276-82.
3. Fayngersh V, Drakopanagiotakis F, McCool FD, Klinger JR. Pulmonary hypertension in a stable community-based COPD population. *Lung*, 2011; 189: 377-82.
4. Hu G, Zhou Y, Tian J, Yao W, Li J, Li B, et al. Risk of COPD from exposure to biomass smoke: a meta analysis. *Chest*. 2010; 138: 20-31.
5. Gupta NK, Agrawal RK, Srivastav AB, Ved ML. Echocardiographic evaluation of heart in chronic obstructive pulmonary disease patient and its correlation with the severity of disease. *Lung India*, 2011; 28: 105-9.
6. Sims MW, Margolis DJ, Localio AR, Panettieri RA, Kawut SM, Christie JD. Impact of pulmonary artery pressure on exercise function in severe COPD. *Chest*, 2009; 136: 412-19.
7. Badesch DB, Champion HC, Sanchez MA, Hoeper MM, Loyd JE, Manes A, et al. Diagnosis and assessment of pulmonary arterial hypertension. *J Am Coll Cardiol*, 2009; 54: 55-66.
8. Galiè N, Corris PA, Frost A. Updated treatment algorithm of pulmonary arterial hypertension. *J Am Coll Cardiol*, 2013; 62: D60.
9. Kurundkar G, Pophale h. Retrospective study of frequency of pulmonary hypertension in chronic obstructive pulmonary disease (COPD)". *Ind J App Res.*, 2014; 12(4): 400-01.
10. Naeije R, Barbera JA. 'Pulmonary hypertension associated with COPD', *Crit Care.*, 2001; 5(6): 286-89.
11. Apostolova O, Sushko V, Tatarenko O. Frequency of pulmonary hypertension in patients with COPD - Clean-up workers of Chernobyl catastrophe. *Eur Resp J.*, 2013; 42: P1026.
12. Cuttica MJ, Kalhan R, Shlobin OA. "Categorization and impact of pulmonary hypertension in patients with advanced COPD," *Resp Med*, 2010; 104(12): 1877-82.