

# FREQUENCY OF ATRIAL FIBRILLATION IN CHRONIC OBSTRUCTIVE PULMONARY DISEASE

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**Background:** Chronic obstructive pulmonary disease (COPD) is a common disease reported to Pulmonology wards and outdoors. Cardiac complications especially atrial fibrillation are common and add to overall morbidity and mortality. **Objective:** To determine the frequency of atrial fibrillation in patients of chronic obstructive pulmonary disease (COPD). **Methodology:** This was a cross sectional study carried out at pulmonology ward of Sheikh Zayed Hospital, Medical College Rahim Yar Khan from 1<sup>st</sup> July 2016 to 28<sup>th</sup> February 2017. In this study, 111 patients having COPD were included. Detailed demographic and co morbid conditions like DM and HTN was taken. These cases then underwent ECG and atrial fibrillation was identified. The data was entered and analyzed by SPSS version 21. **Results:** In this study, total 111 patients were enrolled out of which 94 (84.7%) were males and 17 (15.3%) were females with mean age of 58.16±9.94 years. There were 7 (6.3%) cases that has DM and 22 (19.8%) cases has Hypertension. Atrial fibrillation was observed in 16 (14.41%) patients. Atrial fibrillation was seen in 4 (25%) out of 16 cases with DM (p= 0.07). Among hypertensive patients it was seen in 8 (50%) out of 16 cases with significant p value of 0.001. There was no significant difference in terms of gender and different age groups with p value of 0.27 and 0.17. **Conclusion:** Atrial fibrillation is commonly seen in cases of COPD and is significantly higher in cases that has concomitant hypertension.

**Key words;** Atrial fibrillation, COPD, Frequency, DM

## INTRODUCTION

Chronic obstructive pulmonary disease (COPD) is a common, preventable and treatable disease that is characterized by persistent respiratory symptoms and airflow limitation that is due to airway and/or alveolar abnormalities usually caused by significant exposure to noxious particles or gases.<sup>1</sup> COPD is a leading cause of morbidity and mortality throughout the world. The most common risk factors for COPD are tobacco smoking and exposure to biomass fuels. COPD is the 5<sup>th</sup> leading cause of death worldwide but it is considered to be at 3<sup>rd</sup> by 2030 due to increased incidence of tobacco smoking.<sup>2,3</sup>

Despite of health care efforts and medical research throughout the world, COPD is uprising as cause of mortality unlike other fatal diseases e.g., cardiovascular diseases and cancer, which are facing decline as cause of mortality.<sup>3</sup> Age and smoking are major risk factors for COPD and associated comorbid conditions like diabetes mellitus further add to misery of patient.<sup>4,5</sup>

Quality of life is impaired in presence of comorbid conditions even in early stages of COPD.<sup>6</sup> Comorbid conditions may coexist with COPD as independent entity or it may have same risk factors/pathology as that of COPD. Such patients require multiple therapeutic interventional approach.<sup>7,8</sup> Most common comorbid conditions are lung cancer, pulmonary fibrosis, atrial fibrillation/ flutter, congestive heart failure,

coronary artery disease, cirrhosis of liver, diabetes mellitus and anxiety.<sup>9</sup> The objective of current study was to determine the frequency of atrial fibrillation in patients of chronic obstructive pulmonary disease.

## METHODOLOGY

This was a cross sectional study and was carried out at pulmonology ward of Sheikh Zayed Hospital, Rahim Yar Khan dated from 1<sup>st</sup> July 2016 to 28<sup>th</sup> February 2017. In this study, 111 patients having COPD (diagnosed as per guidelines of COPD GOLD 2016) admitted in Pulmonology ward were included. Detailed demographic and other history was taken. Data regarding co morbid conditions like DM and hypertension was also taken. These cases then underwent ECG and atrial fibrillation was identified. The data was entered in SPSS 21 and then analysed. Post stratification chi square test was applied taking p value < 0.05 as significant. Approval from Institutional Review Board was sought before conducted this study.

**Inclusion criteria:** The cases with age range of 40 years or above of either gender that is diagnosed cases of chronic obstructive pulmonary disease as per criteria of COPD GOLD guidelines 2016 were included in this study.

**Exclusion criteria:** The cases suffering from ischemic heart disease, the cases with valvular heart disease and cases with electrolyte imbalance were excluded.

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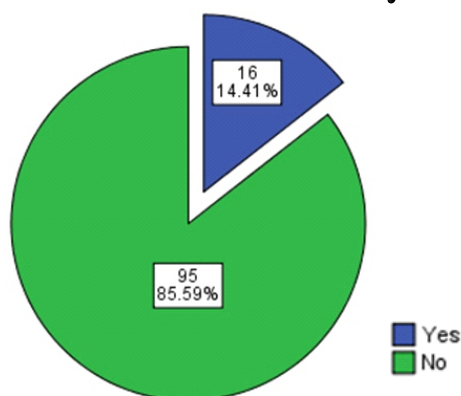
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## RESULTS

In this study, total 111 patients were enrolled out of which 94 (84.7%) were males and 17 (15.3%) were females with mean age of  $58.16 \pm 9.94$  years. There were 7 (6.3%) cases that has DM and 22 (19.8%) cases has hypertension. Atrial fibrillation was observed in 16 (14.41%) patients as shown in Figure I. Atrial fibrillation was seen in 4 (25%) out of 16 cases with DM ( $p = 0.07$ ). Among hypertensive patients it was seen in 8 (50%) out of 16 cases with significant  $p$  value of 0.001. There was no significant difference in terms of gender and different age groups with  $p$  value of 0.27 and 0.17 as in Table I.

**Figure I: Atrial fibrillation in study subjects. (n= 111)**



**Table I: Atrial fibrillation with respect to study variables (n= 111)**

Atrial Fibrillation	DM		Total	P Value
	Yes	No		
Yes	04 (25%)	12 (75%)	16 (14.4%)	0.07
No	03 (3.2%)	92 (96.8%)	95 (85.6%)	
	Hypertension		Total	P Value
	Yes	No		
Yes	08 (50.0%)	08 (50.0%)	16 (14.4%)	0.001
No	14 (14.7%)	81 (85.3%)	95 (85.6%)	
	Age Group (years)		Total	P Value
	40 to 59	60 and above		
Yes	05 (31.3%)	11 (68.8%)	16 (14.4%)	0.177
No	47 (49.5%)	48 (50.5%)	95 (85.6%)	
	Gender		Total	P Value
	Male	Female		
Yes	15 (93.8%)	01 (6.3%)	16 (14.4%)	0.276
No	79 (83.2%)	16 (16.8%)	95 (85.6%)	

## DISCUSSION

COPD is the 5<sup>th</sup> leading cause of death in the world and it is considered to be the 3<sup>rd</sup> leading cause of death by 2030. COPD and atrial fibrillation often

coexist. Prevalence atrial fibrillation of and non-sustained VT in COPD is found around 23.3% and 13% respectively.<sup>2,3</sup> In this study atrial fibrillation was seen in 16 (14.41%) cases of COPD. Similar range of patients have been seen to suffer from this complication in the past where 10-15% of cases developed it.<sup>10,11</sup>

Atrial fibrillation was seen more in cases with DM as compared to non-diabetics. This was also reported in the previous study.<sup>12,13</sup> This can be explained possibly because DM contributes as a core factor causing atherosclerosis, which may lead to ischemic episodes. But as the patient also have diabetic neuropathy so many episodes of ischemia go asymptomatic ultimately leading to infarcted tissue and this serves as a focus for arrhythmias like atrial fibrillation. Hypertension has shown significant association with atrial fibrillation where it was seen in fifty percent of cases. Hypertension is also a well-developed risk factor for development of ischemic heart disease.<sup>14</sup> Moreover it is also another factor and leading ischemia of heart tissue ultimately leading to a focus for arrhythmia. Atrial fibrillation was also seen in higher number in older age groups where 11 out of 16 cases developed it as compared to relatively younger age groups. This was also observed by the other studies from different countries.<sup>15,16</sup> The reason for higher number can be explained by the factors that in old age risk of ischemic heart disease are also increased due to arteriosclerosis. Other co morbid conditions can be other contributing factors.

In the present study male gender revealed higher atrial fibrillation rate. The other studies also showed that male had higher number of this but like our study, they also did not find any significant association.<sup>12,17</sup> The reason of higher number can be multifactorial. Male gender is an independent risk factor for heart disease. Furthermore, the smoking, alcoholism and drug abuse can be the other factors that add to over all morbidity along with the COPD in the form of atrial fibrillation.

## CONCLUSION

Atrial fibrillation is commonly seen in cases of chronic obstructive pulmonary Disease and is significantly higher seen in cases that had concomitant hypertension.

## Conflict of interest

There is no conflict of interest among all authors.

## REFERENCES

1. Global Initiative for Chronic Obstructive Lung Disease. Global strategy for the diagnosis, management and prevention of chronic obstructive pulmonary disease. Revised 2014. Available from: <http://www.goldcopd.org/guidelines-global-strategy-for-diagnosis-management.html>. Accessed March 20, 2017.
2. Rabe KF, Hurd S, Anzueto A, et al. Global strategy for the diagnosis, management and prevention of chronic obstructive pulmonary disease: GOLD executive summary. *Am J Respir Crit Care Med*. 2007;176(6):532–555.
3. World Health Organization. Chronic obstructive pulmonary disease (COPD). 2011. Available from: <http://www.who.int/respiratory/copd> <http://www.who.int/respiratory/copd>. Accessed March 20, 2017.
4. Chatila WM, Thomashow BM, Minai OA, Criner GJ, Make BJ. Comorbidities in chronic obstructive pulmonary disease. *Proc Am Thorac Soc*. 2008;5(4):549–555.
5. Tsiligianni IG, Kosmas E, Van der Molen T, Tzanakis N. Managing comorbidity in COPD: a difficult task. *Curr Drug Targets*. 2013;14(2): 158–176.
6. Koskela J, Kilpeläinen M, Kupiainen H, et al. Comorbidities are the key nominators of the health related quality of life in mild and moderate COPD. *BMC Pulm Med*. 2014;14(1):102-05.
7. Valderas JM, Starfield B, Sibbald B, Salisbury C, Roland M. Defining comorbidity: implications for understanding health and health services. *Ann Fam Med*. 2009;7(4):357–36.
8. Bower P, Macdonald W, Harkness E, et al. Multiborbidity, service organization and clinical decision making in primary care: a qualitative study. *Fam Pract*. 2011;28(5):579–587.
9. Divo M, Cote C, de Torres JP, et al. Comorbidities and risk of mortality in patients with chronic obstructive pulmonary disease. *Am J Respir Crit Care Med*. 2012;186(2):155–161.
10. Camm AJ, Kirchhof P, Lip GY, Schotten U, Savelieva I, Ernst S, et al; European Heart Rhythm Association; European Association for Cardio-Thoracic Surgery Guidelines for the management of atrial fibrillation: The Task Force for the Management of Atrial Fibrillation of the European Society of Cardiology (ESC). *Eur Heart J*. 2010;31(19):2369–429.
11. Sidney S, Sorel M, Quesenberry CP Jr, DeLuise C, Lanes S, Eisner MD. COPD and incident cardiovascular disease hospitalizations and mortality: Kaiser Permanente Medical Care Program. *Chest*. 2005;128(4):2068–75.
12. Li J, Agarwal SK, Alonso A, Blecker S, Chamberlain AM, London SJ, et al. Airflow obstruction, lung function, and incidence of atrial fibrillation: the Atherosclerosis Risk in Communities (ARIC) study. *Circulation*. 2014;129(9):971–80.
13. Huang B, Yang Y. Radiofrequency catheter ablation of atrial fibrillation in patients with chronic obstructive pulmonary disease: opportunity and challenge: response to Dr Kumar's comment. *J Am Med Dir Assoc*. 2015;16(1):83–4.
14. Caglar IM, Dasli T, Turhan Caglar FN, Teber MK, Ugurlucan M, Ozmen G. Evaluation of atrial conduction features with tissue Doppler imaging in patients with chronic obstructive pulmonary disease. *Clin Res Cardiol*. 2012;101(8):599–606.
15. Lopez CM, House-Fancher MA. Management of atrial fibrillation in patients with chronic obstructive pulmonary disease. *J Cardio Nurs*. 2005;20(2):133–40.
16. de Vos CB, Pisters R, Nieuwlaat R, Prins MH, Tieleman RG, Coelen RJ, et al. Progression from paroxysmal to persistent atrial fibrillation clinical correlates and prognosis. *J Am Coll Cardiol*. 2010;55(8):725–31.
17. Steer J, Gibson J, Bourke SC. The DECAF Score: predicting hospital mortality in exacerbations of chronic obstructive pulmonary disease. *Thorax*. 2012;67(11):970–6.

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