



Original Article

## To determine role of clinical cardiological evaluation and ECG in associated left ventricular disease among COPD patients

Prakash Tiruwa<sup>1</sup>, Yogesh Purushottam Tayade<sup>2</sup>, Randhir K.Pandey<sup>3</sup>

<sup>1,2,3</sup>Department of Biochemistry, Dr. Ulhas Patil Medical College & Hospital, Jalgaon

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### Corresponding Author:

**Dr. Randhir Kumar Pandey**  
Department of Biochemistry, Dr.  
Ulhas Patil Medical College &  
Hospital, Jalgaon

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### ABSTRACT

**Background:** - The present study was planned to determine role of clinical cardiological evaluation and ECG in associated left ventricular disease among COPD patients.

**Introduction:** - These patients usually respond to oxygen (O<sub>2</sub>) therapy, bronchodilators and antibiotics. However left ventricular (LV) dysfunction has been observed by several workers among such patients.

**Material & Methods:** - The present study included all diagnosed case of COPD of both gender, above the age of 40 years, attending outdoor and indoor of the department of respiratory medicine, the stipulated period, after considering the inclusion and exclusion criteria.

**Statistical Analysis:** - Statistical analysis was performed using SPSS version 20. All the data were presented as mean ±SD for continuous variables and percentage for categorical variables. A comparison was done between variables using independent students 't'- test.

**Results:** - The correlation between radiological finding of chest and the prevalence of LV diastolic dysfunction. Radiological findings of LV diastolic dysfunction was observed in 236 out of 257 (91.83%) cases with hyperinflated lung in CXR, whereas it was 71 out of 98 (72.42%) in patients with prominent broncho-vascular marking in CXR. There was no significant relation between chest x-ray findings and LV diastolic dysfunction. (P = > 0.05).

**Conclusion:** - In our study we found dyspnea to be the predominant symptom. Although some studies indicated a weak relationship between the symptoms of dyspnea as a indicator of disease severity and left ventricular ejection fraction (FEV<sub>1</sub>, LVEF). But some other studies did not find any such corelationship. We too did not find any significant association between this predominant symptom of dyspnea and LV diastolic dysfunction.

**Keywords:** COPD, Pulmonary, Interventricular, LV, RV.

### INTRODUCTION

The persistent airways obstruction in older chronic asthmatics is often difficult or even impossible to differentiate from that in COPD, although a history of heavy cigarette smoking, evidence of emphysema by imaging techniques, decreased diffusing capacity for carbon monoxide and chronic hypoxemia favor a diagnosis of COPD<sup>1</sup>. However left ventricular (LV) dysfunction has been observed by several workers among such patients. The ratio of LV dysfunction, alternative to ischemic heart disease (IHD), is likely higher in COPD patients because it portion many danger factors with coronary disease like age, male predomination, cigarette smoky etc.<sup>2</sup>

### MATERIAL & METHODS

#### Study Area

Department of Respiratory Medicine, Dr. Ulhas Patil Medical College and Hospital, Jalgaon

### Study Population

Each known case of COPD of some gender, preceding the age of 40 years, being outdoor and indoor of the department of respiratory medicine, Dr. Ulhas Patil Medical College and Hospital, Jalgaon over the stipulated period, after considering the inclusion and exclusion criteria.

### Study Design

Observational cross-sectional study.

### Statistical Analysis:-

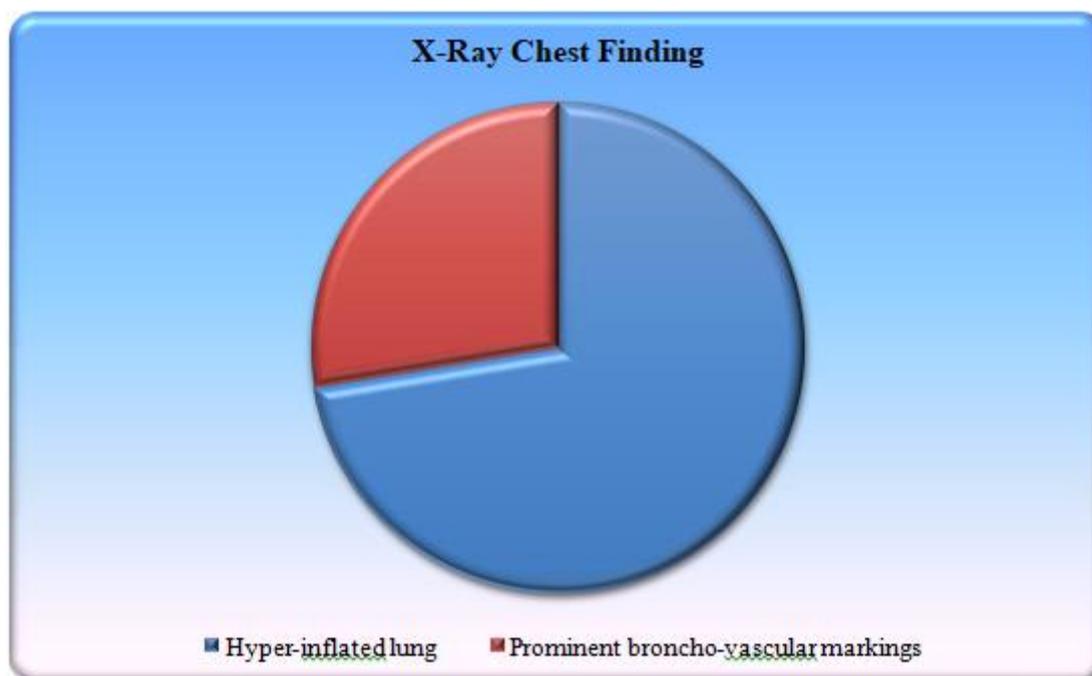
Statistical analysis was performed using SPSS. Each the information were given as mean + SD for uninterrupted variant and proportion for accumulation changeable. A comparison was done between changeable using independent students 't'-test. A p-value. A p-value <0.05 was considered as statistically significant.

## RESULTS

**Table 1:- Shows chest X-ray finding of the study population.**

X-RAY CHEST FINDINGS	NO. OF PATIENTS	PERCENTAGE
Hyper-inflated lung	257	72%
Prominent bronchovascular markings	98	28%

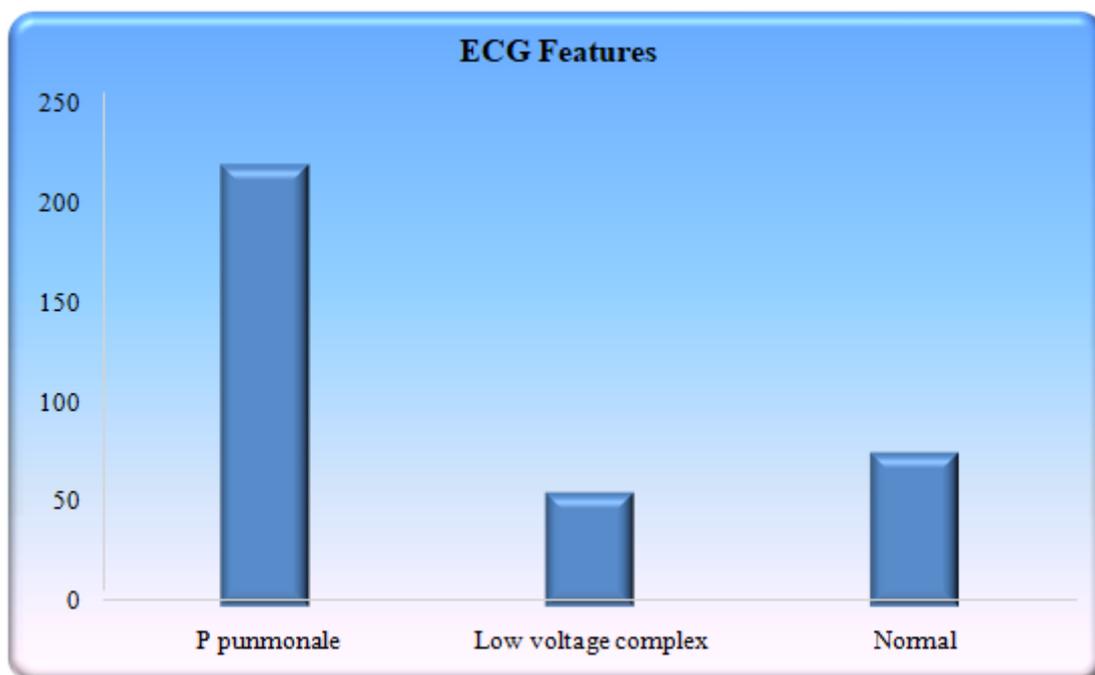
Our study was shown in table-1. Chest Xray (CXR) showed hyper-inflated lung in 257 (72%) cases and prominent bronchovascular marking in 98 (28%) cases. Other radiological findings were bulla found in (43, 12%), hilar prominence (28,8%), tubular heart (28,12%), right ventricular enlargement (28,8%) and low flat diaphragm (50,14%).



**Table 2:- Showing the ECG findings in the study population.**

ECG FEATURES	NO. OF PATIENTS	PERCENTAGE
P pulmonale	221	62%
Low voltage complex	57	16%
Normal	77	22%

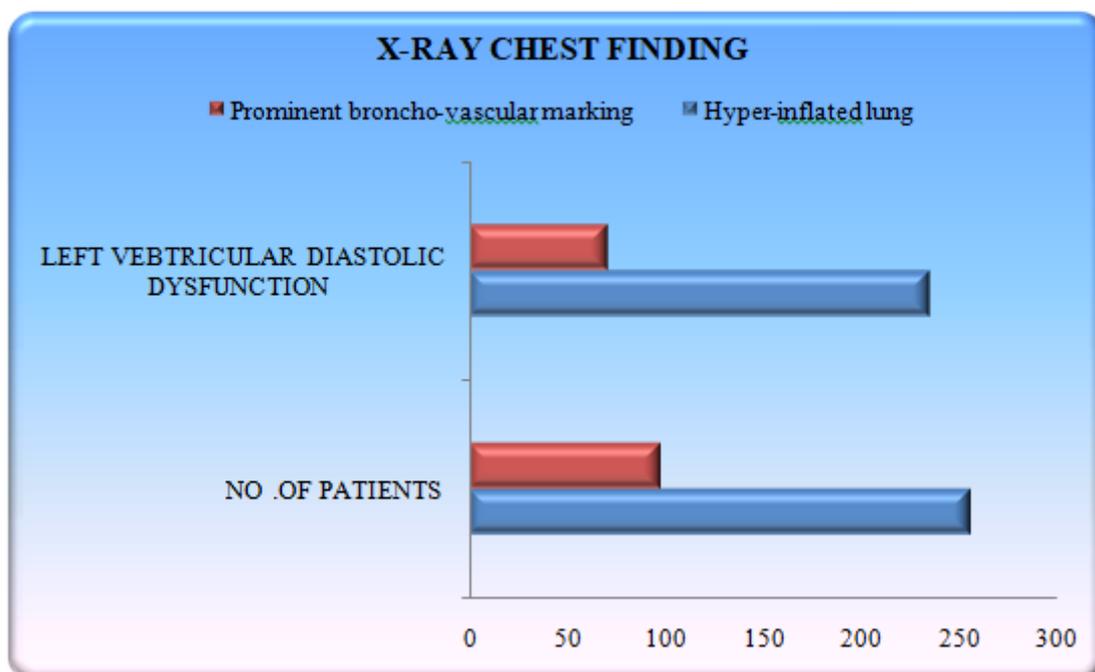
Our study were P-pulmonale was found in 221(62%) cases, low voltage complex was found in 57(16%) cases, right bundle brunch block pattern was noted in (28,8%) and ECG picture of right ventricular hypertrophy was observed in (7,2%) case. In 77 (22%) cases ECG was normal. We did not get arrhythmia in any case. P-pulmonale was the predominant ECG finding in our study, and that signified right atrial enlargement as a result of RV hypertrophy secondary to pulmonary arterial hypertension in COPD.



**Table 3:- Showing correlation between X-ray chest finding and LV diastolic dysfunction**

X-RAY CHEST FINDING	NO .OF PATIENTS	LEFT VEBTRICULAR DIASTOLIC DYSFUNCTION	PERCENTAGE
Hyper-inflated lung	257	236	91.83%
Prominent broncho-vascular marking	98	71	72.45%

We analyzed the correlation between radiological finding of chest and the prevalence of LV diastolic dysfunction. Radiological findings of LV diastolic dysfunction was observed in 236 out of 257 (91.83%) cases with hyperinflated lung in CXR, whereas it was 71 out of 98 (72.42%) in patients with prominent broncho-vascular marking in CXR. The calculated  $\chi^2$  was 1.73 and P was 0.18. So, there was no significant relation between chest x-ray findings and LV diastolic dysfunction. ( $P = > 0.05$ ).



## DISCUSSION

We have assessed left ventricular function in COPD patients and have found that majority of them have LV diastolic dysfunction and that is statistically highly significant ( $p < 0.05$ ). In our study we recovered dyspnea to be the frequent symptom. Although some studies signal a weak relation between the symptoms of dyspnea as a index of disease severity and left ventricular expulsion fraction (FEV1, LVEF).<sup>3</sup> But some other studies did not find any such corelationship<sup>4-5</sup>. We too did not find any significant association between this predominant symptom of dyspnea and LV diastolic dysfunction ( $p > 0.05$ )

We determined that there was addition prevalence of LV diastolic dysfunction in our subset of patients, but only one patient had systolic dysfunction which was not important statistically. We could not found the cause of systolic dysfunction in one patient as we excluded patients with myocardial infarction, ischaemic heart disease, cardiomegaly, valvular heart disease and hypertensive heart disease. To find out hidden ischaemic heart disease or myocardial disease, cardiac catheterization, coronary angiography or myocardial biopsy were necessary but those procedures were not included in our study. A. K. Podder et al<sup>6</sup> according constant of LV systolic function like EF, was down in the subset of patients of COPD with corpulmonale. However we did not find any such co-relation.

## CONCLUSION

We recovered 2 % cases with low EF, and the mean EF was (67%) with standard deviation SD (7%). No patient in my study had abnormal ventricular wall movement. For assessment of LV diastolic function I recorded early rapid filling phage /late rapid filling phage (E/A), deceleration time (DT) and is volumetric relaxation time (IVRT). We noted low E/A ratio (normal: 1-1.5) in 84% cases, and the mean E/A ratio was 0.92 with SD 0.20. We recovered accrued DT in 84% cases with mean  $247.42 \pm 18.76$ . IVRT was accrued in 84% cases with mean  $96.78 \pm 8.44$ . Left ventricular diastolic dysfunction was noted in 84% proceeding and both systolic and diastolic dysfunction was listed in 2% case. Separated systolic dysfunction was not recovered in the examination. 48 patients had normal echocardiography.

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