



## MORE COMMON, MAY MISLEAD SOMETIME.

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## KEYWORDS :

## INTRODUCTION:

Patient with heart failure with preserved Ejection fraction have a devastating 5 years mortality rate, increased hospitalization about 50% every six months with maximum myocardial oxygen consumption<sup>1</sup>. Heart failure with preserved ejection fraction occurs in 5 to 9 decades of life<sup>1,2</sup>. The most common antecedent disease leading to heart failure with preserved ejection fraction is systolic hypertension<sup>2</sup>. Here we report a challenging work up, management of 72 years old male where heart failure with preserved ejection fraction was mask reading as COR PULMONALE.

## Case Report:

A 72 year old male who was chronic smoker and known case of COPD, T2DM, SHTN presented to medicine OPD with complaints of sudden onset breathlessness, Cough with expectoration for six days. On arrival his vitals were pulse rate: 58/min, blood pressure :180/100 mm hg, SPO2: 92% on room air. Systemic examination showed bilateral inspiratory crepts in the infra - axillary region. Chest x ray was suggestive of bilateral pleural effusion. Echo showed concentric left ventricular hypertrophy, adequate LV function EF: 56%, mild Mitral regurgitation, mild aortic regurgitation, moderate tricuspid regurgitation, PSAP -65 mmHg, mild right atrium and right ventricle dilated.

Above findings were suggestive of Acute exacerbation of COPD- COR PULMONALE and he was treated with inhalational steroids, inhalational broncho dilators and low dose diuretics. As the patient did not improve after the initial assessment his echo was reassessed which showed increased left ventricular filling pressure (33) and left atrium dimension above upper limit, which was suspicious of heart failure and NT PRO BNP was 7341 and he was diagnosed as heart failure with preserved ejection fraction and was started on high dose diuretics and patient improved symptomatically.



Figure showing the chest x ray and 2d echo of the patient.

## DISCUSSION:

In patients with acute exacerbation of COPD, diagnosing the left ventricular dysfunction is a significant challenge. This is important because identifying the heart failure will completely change the treatment of the patient<sup>2</sup>. In COPD patients there is a high prevalence of masked heart failure with preserved ejection fraction which indicates COPD is an independent risk factor of vascular damage<sup>4</sup>. There are many factors which

contribute to cause of left ventricular dysfunction in COPD patients mainly includes hypoxia and systemic pro inflammatory state<sup>1,7</sup>. The inflammation leads to elevation of tumour necrosis factor(TNF), interleukin 6 (IL-6), CRP which increases selectin, VCAM and oxidative stress in the vascular endothelium<sup>6,4</sup>. The alveolar hypoxia also plays important role which mainly depends on the severity of the hypoxia and pulmonary artery pressure or pulmonary vascular resistance<sup>1,7</sup>. There is significant constriction of resistance pulmonary arteries and pulmonary vascular remodelling which depends on alveolar hypoxia<sup>8</sup>. There - fore the pulmonary vascular remodelling causing the pulmonary hypertension may associate with left ventricular dysfunction in patients with COPD<sup>1,9</sup>. The severe obstruction of the air flow is related to left ventricular filling and reduced stroke volume without change in the left ventricular ejection fraction<sup>1</sup>. The trans thoracic pressure gradients may accelerates right atrium remodelling that may seen in early stages of left ventricular dysfunction in COPD patients with heart failure with preserved ejection fraction. This confirms that COPD patient with left ventricular dysfunction have significantly changed right atrium geometry<sup>5</sup>.

The prevalence of left ventricular dysfunction in COPD patients is the precondition for heart failure with preserved ejection fraction. The main methods to asses the cardiac function includes invasive cardiac catheterisation and echo cardiography. There is a significant association of NT- pro BNP and left ventricular dysfunction in COPD patients, also there is strong association between elevation of troponin and increased mortality rate<sup>11</sup>. In echo the best predictive values for left ventricular dysfunction includes right atrial volume index, the parasternal diameter of right ventricle<sup>1</sup>. The trans mitral flow indexes is also an important diagnostic, prognostic implication in patients with COPD. The diastolic dysfunction can be assessed by the early diastolic velocity at the mitral annulus<sup>4</sup>. Combining the mitral inflow with the mitral annular velocity (E/e) can also predict left ventricular filling pressure irrespective of left ventricular systolic function, heart rate, cardiac rhythm<sup>4</sup>. Plethysmographic pulse amplitude ratio is also an independent predictive value of left ventricular dysfunction<sup>2</sup>. To detect the subclinical left ventricular dysfunction tissue doppler imaging is also an sensitive tool<sup>1,10</sup>. After detecting the left ventricular dysfunction in COPD patients and condition and shall notice decrease episodes of exacerbations of COPD<sup>1,4</sup>.

## CONCLUSION:

The above case reinforces that importance of left ventricular diastolic dysfunction assessment in patients who come with acute exacerbations of COPD.

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