

## **Intensity and Stage of Airflow Limitation and Presence of Heart Failure in Patients with Chronic Obstructive Pulmonary Disease**

**Alizaman Sadigov\***

*Pulmonary Medicine Department of Education and Therapeutic Hospital, Azerbaijan Medical University, Baku City, Azerbaijan*

**\*Corresponding Author:** Alizaman Sadigov, Pulmonary Medicine Department of Education and Therapeutic Hospital, Azerbaijan Medical University, Baku City, Azerbaijan.

**Received:** March 29, 2019; **Published:** June 17, 2019

Heart failure (HF) and chronic obstructive pulmonary disease (COPD) are common diseases of aging and leading cause of morbidity and mortality worldwide [1]. Old age, as well as shared risk factors and pathophysiology, means that these 2 diseases are often experienced together, with each influencing the clinical course of the other [3]. Prevalence of COPD affects approximately a third of patients with HF [4] and studies have consistently shown COPD to be associated with higher mortality for patients with HF. The GOLD guidelines recommend the use of forced expiratory volume in 1 second (FEV1) to measure the severity of airflow limitation in COPD [5]. Patients with COPD with routinely recorded spirometry were stratified by 4 severity stages recommended by GOLD: mild, 80% or more predicted; moderate, 50% or more FEV1 but less than 80% predicted; severe, 30% or more FEV1 but less than 50% predicted; and very severe, FEV1 less than 30% predicted. Of patients with HF and COPD, those with a spirometry measure were more likely to be older, male, more deprived, lower body mass index, higher cholesterol and hemoglobin than those without. Those patients were also most likely to have moderate to severe airflow limitation (70%) and less likely to have mild airflow limitation (15%).

Presence of HF and COPD were significantly associated with all-cause mortality and with first hospitalization (and these associations were not affected by beta-blockers but mortality risk was significantly higher in women than men. Recent studies suggested that in patients with COPD with III and IV GOLD spirometry stage of airflow limitation had significantly increased mortality and hospitalization due to HF compared with patients with I and II spirometry stage of airflow limitation. As known the patients with COPD with severe -to -very severe airflow limitation and with frequent risk of exacerbations and more severe symptoms need to the triple therapy including long-acting beta-agonists (LABA), long-acting cholinergic (LAMA), and inhaled corticosteroids (ICS) for reduction of the risk of exacerbation of the disease and oral corticosteroids are one of necessary component of medication used to threat of exacerbation of COPD. Studies suggested that both medications are associated with increased risk of hospitalization in patients with COPD associated with HF [5]. Severity of airflow limitation was significantly associated with increased risk of hospitalization and heart failure of patients with COPD. In such group patients severe ( $30\% \leq FEV1 \leq 50\%$ ) and very severe ( $FEV1 < 30\%$ ) airflow limitation had the highest risk association with mortality than the patients with mild and moderate airflow limitation [6].

Chronic obstructive pulmonary disease was not associated with any increased risk of death when patients were managed by inhaler therapy, until prescribed intensity reached triple inhaler therapy and risk of both outcomes were significantly higher in those prescribed oral corticosteroids and oxygen therapy. Spirometry assessment may be underused in the community but indicated a more severe HF and COPD GOLD stage group, with worse outcomes for those with the most severe airflow limitation. These suggestions provide key evidence for risk stratifying patients with HF and COPD in the community, where most patients are routinely managed. One of study suggested that 1 in 7 patients with HF in the community also has COPD, which carries a 30% increase in risk of death and hospitalization compared with patients with HF without COPD [7]. Given that the common symptom of breathlessness potentially drives spirometry assessment, it is likely that the COPD group without spirometry includes those with milder-severity COPD as well as less severe HF. Newer GOLD

guidelines focus on symptom-based severity assessment, which creates new challenges in patients with HF who share breathlessness and functional limitation as predominant symptoms. Consequently, this may lead to overtreatment and overuse of pulmonary inhaled therapies (with different mechanisms) in patients with HF and COPD. In patients with COPD whom prescribed oral steroids or oxygen therapy and had up to a 3-fold increase mortality risk, which may relate to their adverse effect on other comorbidities such as diabetes, weakened respiratory muscle strength after prolonged therapy, or retention of sodium and water, all of which might lead to exacerbation of HF [8]. Alternatively, short-term prescribing of oral corticosteroids or oxygen therapy are usually a result of acute COPD exacerbations, which are also potentially associated with mortality and are a likely pseudomarker of more severe COPD disease.

The share smoking and systemic inflammation in etiology, with a chronic progressive disease trajectory characterized by exacerbations. Moreover, spirometry overestimates the COPD severity based on FEV1 because HF itself reduces both FEV1 and forced vital capacity values by 10% to 20%. If unsure about stability and pulmonary fluid status, it is better to perform body plethysmography to identify COPD especially in patients with HF. Clinicians should realize that adequate (diuretic) treatment of HF may create an euvolemic state in patients with HF, that is, without pulmonary fluid overload not only relieving the patient's shortness of breath but also critically reducing the risk of overdiagnosing COPD with spirometry.

Considering the therapeutic management of patients with both HF and COPD, there are realistic concerns about interactions and adverse effects of pulmonary drugs on cardiac function, notably oral prednisolone and short-acting inhaled beta-mimetics. Inadequate assumptions about interactions can impede proper management. The use of short-acting inhaler only or monotherapy in patients with HF and without COPD was significantly associated with approximately 30% increased risk of all-cause hospitalizations, confirming that we should be careful with short-acting inhaler beta-mimetics in HF.

## **Bibliography**

1. Guder G., *et al.* "Chronic obstructive pulmonary disease in heart failure: accurate diagnosis and treatment". *European Journal of Heart Failure* 16.12 (2014): 1273-1282.
2. Vogelmeier CF., *et al.* "Global strategy for the diagnosis, management, and prevention of chronic obstructive pulmonary disease 2017 report. GOLD executive summary". *American Journal of Respiratory and Critical Care Medicine* 195.5 (2017): 557-582.
3. Brenner S., *et al.* "Airway obstruction in systolic heart failure -COPD or congestion?" *International Journal of Cardiology* 168.3 (2013): 1910-1916.
4. Guder G., *et al.* "The impact of heart failure on the classification of COPD severity". *Journal of Cardiac Failure* 18.8 (2012): 637-644.
5. Lawson CA., *et al.* "Association of medication intensity and stages of airflow limitation with the risk of hospitalization or death in patients with heart failure and chronic obstructive pulmonary disease". *JAMA Network Open* 1.8 (2018): e185489.
6. Valk MJ., *et al.* "COPD in patients with stable heart failure in the primary care setting". *International Journal of Chronic Obstructive Pulmonary Disease* 10 (2015): 1219-1224.
7. Celli B., *et al.* "Cardiovascular safety of tiotropium in patients with COPD". *Chest* 137.1 (2010): 20-30.
8. Gershon A., *et al.* "Cardiovascular safety of inhaled long-acting bronchodilators in individuals with chronic obstructive pulmonary disease". *JAMA Internal Medicine* 173.13 (2018): 1175-1185.

**Volume 8 Issue 7 July 2019**

**©All rights reserved by Alizaman Sadigov.**