

*Research Article***Role of dyspnea and laboratory investigation in determining severity of chronic obstructive pulmonary disease**

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Abstract

Background: COPD is a systemic inflammatory and endothelial disease, it is characterized by airflow limitation, dyspnea and exacerbations, dyspnea is a cardinal symptom of this disease, and its severity and magnitude increases as the disease progresses, leading to significant disability and a negative effect on quality of life. **Objectives:** This work aims to assist severity of dyspnea with progress of the disease and role of complete blood count in diagnosis of exacerbation. **Methods:** The blood samples were collected by aseptic way and undergo routine and specific analysis. **Results:** 80 % of stable COPD patients were complaining of exertional dyspnea while 85 % of COPD patients suffered from dyspnea at rest during exacerbation, Regarding Hemoglobin, TLC, Platelets there was no statistically significant differences between the studied groups ($p= 0.085, 0.091$ and respectively), Regarding neutrophils, eosinophil and monocytes there were statistically significant differences between groups.

Introduction & Aim of the work

Chronic obstructive pulmonary disease (COPD) is a chronic inflammatory lung disease that affects small airways, lung parenchyma, and vascular endothelium (Eapen et al., 2017).

COPD is not a disease that affects only the lungs; it is a systemic inflammatory and endothelial disease, It is characterized by airflow limitation, breathlessness and exacerbations (Langholm et al., 2020).

Exacerbations are important events with a significant influence on prognosis, and prevention of exacerbations is a central element in the management of COPD, The etiology of acute exacerbation of COPD (AECOPD) is still uncertain ,however smoking and air pollution were reported to have a role ⁽¹⁾.

Most AECOPD are associated with evidence of viral or bacterial infections or both ⁽²⁾.

As a result, antibiotic therapy is vital for management of AECOPD. The diagnosis of AECOPD is primarily made based on the clinical manifestations of patients ⁽³⁾

It is of great significance to find out one or more biomarkers which can be used for the early identification of AECOPD, confirmation

whether bacterial infections are present, and guidance of therapy ⁽⁴⁾.

Dyspnea: is a major cause of the disability and anxiety in COPD, This is simply described as air hunger or increased effort to breathe. It is usually chronic, progressive, and increases with exertion (*Mahboub et al., 2017*)

Diagnosis of exacerbation

1-Increase in breathless than usual with routine activities .

2- Increase in severity and frequency of cough.

3-A change in the color of your sputum (mucus) from clear to colored (deep yellow, green, or brown) and/or the amount of sputum that you bring up may increase. In many people, a change in sputum is the first sign that they have an exacerbation (Lareau et al., 2018)

Aim of the work

To evaluate severity of dyspnea with progression of COPD

Subjects and Methods

The present study was carried out at the Clinical Pathology Department, Faculty of Medicine, Minia University, Minia, Egypt through the period from May 2020 to April 2021. It was conducted on 60 subjects after ethical

committee approval and a written consent was obtained from each patient.

Subjects:

The subjects included in the study were divided as follows:

▪ **Group I (patient group):**

It included Twenty (20) patients suffering from stable COPD. The patients were selected from in-patient of Chest Department of Minia University Hospital.

▪ **Group II (patient group):**

It included Twenty (20) patients suffering from COPD on exacerbation. The patients were

selected from out-patient of Chest Department's clinic of Minia University Hospital.

All subjects included in the study were subjected to the following:

1) Careful history taking:

Considering age, occupation, residence, duration of disease, smoking status, presence of cough, expectoration, fever, dyspnea and comorbidities.

2) Examinations: Complete general, abdominal and local examinations.

Results

Table show Comparison between group I and group II regarding Dyspnea :

	Exacerbation (I) (n=20)	Stable (II) (n=20)	p value Z score
Dyspnea:			0.001*
Present at rest	17 (85%)	4 (20%)	0.0001*
Grade 2	1 (5%)	0	0.313
Exertional	1 (5%)	16 (80%)	0.0001*
Grade 4	1 (5%)	0	0.313

Z score for comparison between 2 proportions

**: significant difference at P value <0.05*

- There was significant difference between two groups regarding dyspnea.
- Regarding neutrophils, eosinophil and monocytes there were statistically significant differences between group III and group II (p value =0.0001, 0.002 respectively)
- Regarding Hemoglobin , TLC, Platelets there was no statistically significant differences between the studied groups (p= 0.085, 0.091 respectively)

Discussion

COPD is a leading cause of death worldwide those days, and its burden is expected to increase in the coming years⁽¹⁰⁾.

Over recent years it has become a growing public health issue mainly because of its increasing prevalence, morbidity and mortality⁽¹¹⁾.

It is a chronic inflammation in the lungs that causes obstruction in the airway, poor air flow, and irreversible loss of lung function⁽¹²⁾.

The chronic course of COPD is frequently worsened by acute exacerbations which is dramatically affect quality of life and worsen the natural history of the disease with an increased risk of death⁽¹³⁾.

Exacerbations is a central element in the management of COPD, Systemic inflammation and elevated inflammatory biomarkers have

been linked to increased risk of exacerbations in COPD⁽¹⁴⁾.

In our study Stable COPD patients was complaining of exertional dyspnea, while patients of AECOPD suffer from worsening of dyspnea to become at rest that associated with limited physical activity, increased anxiety and depression

Conclusions

Overall, the findings of this study that dyspnea may be worsened as the disease progress and during exacerbation affecting life quality.

There is significant difference between studied groups regarding neutrophils but There is no significant role of Hemoglobin , total leucocyte count and platelet in determining severity of the disease.

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