



A STUDY ON PREVALENCE OF METABOLIC SYNDROME IN COPD PATIENTS

Pulmonary Medicine

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ABSTRACT

Background: COPD is characterized by airway inflammation which causes the release of inflammatory markers into systemic circulation causing extra pulmonary co-morbidities like metabolic syndrome. As patients of metabolic syndrome are more prone to development of diabetes and myocardial infarction it is necessary for early diagnosis and management of metabolic syndrome in copd patients. **Materials and Methods:** A prospective observational study conducted among 75 patients admitted to medical wards in our hospital from January 2022 to September 2022. Detailed clinical examination and investigations were done. Routine blood investigations like Wbc count, CRP etc. and chest x-ray, ecg were done for all 75 patients. All patients underwent spirometry procedure before and after bronchodilator therapy and were classified according to GOLD criteria measurements in our study. The data are presented as percentages and numbers. Rates and ratios are computed. **Results:** COPD is more common in males when compared to females as smoking is most common in males. maximum number of patients are from stages two and three consisting of 78.6% study population, stage 1 and stage 4 copd patients are 13.3% and 8% respectively. Metabolic syndrome was prevalent in 33% of copd patients which indicate that three or more components of metabolic syndrome were present in these patients. The prevalence of metabolic syndrome was 40%, 54.2%, 62.5%, 16.6% in stage 1, stage 2, Stage 3, Stage 4 copd patients respectively. 35% of copd patients had elevated CRP and out of that 35%, 20 patients (73.5%) had metabolic syndrome. CRP was negative in 40% of COPD patients and only 10% had metabolic syndrome among them. The mean total WBC count in metabolic syndrome is 9287.5 cells/cumm and patients without metabolic syndrome group are 5678.5 cell/cumm with significant difference between two groups. **Conclusion:** COPD is characterized not only by airway inflammation but also by systemic inflammation. Metabolic syndrome is a complex of interrelated medical disorders that increase the risk for type2 diabetes and coronary artery diseases. Systemic inflammation plays a key role in both COPD and metabolic syndrome. The coexistence of copd and metabolic syndrome intensifies the systemic inflammation. Systemic inflammation is more severe in COPD patients with metabolic syndrome than in those without metabolic syndrome early screening for metabolic syndrome in COPD patients is necessary so that early treatment can be started to decrease the incidence of major complications like coronary artery disease and cerebrovascular accidents in COPD patients

KEYWORDS

COPD, Metabolic Syndrome, Systemic Inflammation.

INTRODUCTION

Metabolic syndrome is a multifactorial disease comprising a cluster of risk factors for coronary artery disease, diabetes, fatty liver, several cancers, and stroke. Metabolic syndrome is also called syndrome X, insulin resistance syndrome, dysmetabolic syndrome.

Metabolic syndrome includes five components like central obesity, high blood pressure, hyperglycemia, decreased high-density lipoprotein, elevated triglycerides of which obesity develops earlier than other components.

COPD is characterized by airway inflammation, alveolar destruction, and airflow limitation action. Airway inflammation causes the release of inflammatory markers into the systemic circulation causing extra-pulmonary co-morbidities like metabolic syndrome.

As patients with metabolic syndrome are more prone to the development of diabetes and myocardial infarction, it is necessary for early diagnosis and lifestyle modification and management of metabolic syndrome in COPD patients.

So, this study is conducted to find the prevalence of metabolic syndrome in COPD patients to decrease mortality and morbidity.

AIM

To determine the prevalence of metabolic syndrome in chronic obstructive pulmonary disease

OBJECTIVES

1. To study the association of systemic inflammatory markers like c reactive protein and total white blood cell count in patients with and without metabolic syndrome.
2. To study the prevalence of metabolic syndrome in various stages of chronic obstructive pulmonary disease.

Study design: A prospective observational study.

Study Place: Government Medical college and Government general hospital Kadapa.

Study duration: This study was conducted over a period of 9 months from January 2022 to September 2022 after the approval of Institutional ethical committee

Study Population: This study was conducted among 75 COPD patients on basis of history, clinical examination.

Inclusion Criteria:

Patients more than 40 years of age diagnosed with COPD based on the global initiative for chronic obstructive pulmonary disease guidelines, history, clinical examination, and without exacerbations are included in the study.

Exclusion criteria:

- Patients denying consent.
- Presence of asthma or other chronic respiratory diseases.
- Presence of malignancy or serious co-morbidities that prevents the study completion.
- Patients with active pulmonary tuberculosis.
- Patients with acute exacerbations of COPD or use of systemic corticosteroids in the preceding 3 months.
- Patients with known cardiovascular disease.

Methods: Detailed history regarding occupation, income, smoking, diabetes, hypertension, recent exacerbation, and anthropometric measurements like weight, height was measured and chest X-rays and ECG were taken from all 75 patients who meet inclusion criteria who give the willingness to participate in this study. Patients' socioeconomic status were classified according to modified Kuppuswamy Scale. Patients who smoked greater than 100 cigarettes in their lifetime were considered. Collaborating departments in this study include pulmonary medicine, biochemistry. All patients in this study underwent spirometry procedures before and after

bronchodilator therapy and were classified according to GOLD criteria Measurements in our study.

Statistical Analysis: The data collected was verified for completeness before entering the Microsoft excel spread sheet. The validation of the data was checked at regular intervals. The quantitative data was expressed in frequency and percentage

RESULTS

In our study COPD is more common in males when compared to females as smoking is most common in males. In our study maximum number of patients are from stages two and three consisting of 78.6% study population, stage 1 and stage 4 COPD patients are 13.3% and 8% respectively.

In our study population metabolic syndrome was prevalent in 33% of COPD patients which indicate that three or more components of metabolic syndrome were present in these patients.

There is statistically significant difference between prevalence of metabolic syndrome in different copd stages.

The prevalence of metabolic syndrome was 40%,54.2%,62.5%,16.6% in stage 1, stage 2, Stage 3, Stage 4 copd respectively.

In our study the prevalence of various components of metabolic syndrome was hypertension 39%, Impaired fasting glucose 40%, Abdominal obesity 35%, Elevated triglycerides 39%, Low HDL cholesterol 35%.

In our study 35% of copd patients had elevated CRP and out of that 35%, 20 patients (73.5%) had metabolic syndrome. CRP was negative in 40% of COPD patients and only 10% had metabolic syndrome among them.

In our study the mean total WBC count in metabolic syndrome is 9287.5 cells/cumm and patients without metabolic syndrome group are 5678.5 cell/cumm with significant difference between two groups.

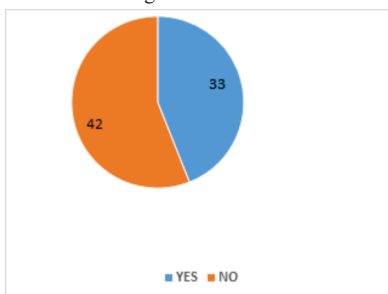


Image 1: No of patients in the different staging of COPD

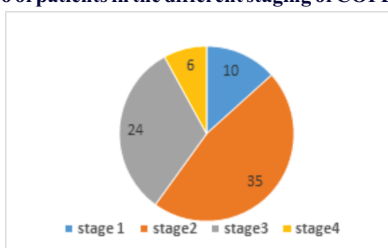


Image 2: Prevalence of metabolic syndrome in COPD patients

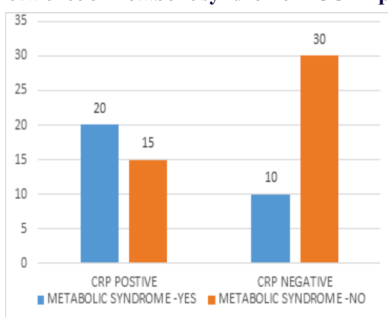


Image 3: Distribution of metabolic syndrome in COPD patients

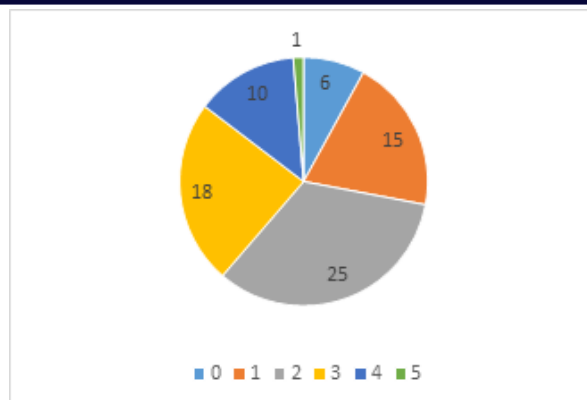


Image 4: Prevalence of metabolic syndrome in different COPD stages

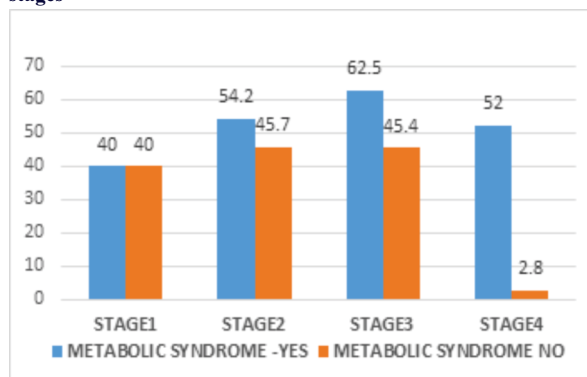


Image 5: C-Reactive Protein Versus Metabolic Syndrome

Table 1: Comparison between COPD Patients with Metabolic Syndrome and without Metabolic Syndrome According to Total Count

Component	Metabolic Syndrome-Yes Mean± Standard Deviation	Metabolic Syndrome –No Mean± Standard Deviation	P-value
Total WBC Count (CELLS/CUMM)	9287.5 (2014.44)	5678.5 (1821.489)	<0.0001

DISCUSSION

Irrespective of severity of impairment of lung function in copd there is an increase in circulatory inflammatory markers such as CRP.

In a study by Therese Ghatas et al CRP was elevated in 54% of COPD patients and out of 54%, 84% patients had metabolic syndrome.

But in our study 35% of COPD patients had elevated CRP and out of those 35%, 20 (57.1%) patients had metabolic syndrome

In a study by Vujic et al Mean total count in copd patients with metabolic syndrome was 9287.5 and without metabolic syndrome was 5678.5 cell/cumm.

In our study Mean total count in COPD patients with metabolic syndrome and without metabolic syndrome was 9560 and 8280 cell/cumm which is similar to their study as systemic inflammation is more common in metabolic syndrome.

In a study conducted by Vujic et al stages two and three patients consist of 41.8% and 38.8% respectively whereas in our study maximum number of patients are from stages two and three consisting of 78.6% study population.

In a study conducted by Vujic et al stage 1 and stage 4 consist of 6.1% and 13.3% respectively whereas in our study it was 13.3% and 8% respectively.

In our study metabolic syndrome was prevalent in 39% of COPD patients which were lower when compared to study conducted by Marie Kathrin Bayer et al in which it accounts for 57% whereas in a

study conducted by Lokendra Dave et al it was 42% which is similar to our study.

In a study conducted by Therese Ghatas et al the prevalence of metabolic syndrome was 40%,53.4%,30%,28.5% in stage 1, stage 2, Stage 3, Stage 4 COPD respectively whereas in our study the prevalence of metabolic syndrome was 40%,54.2%,62.5%,16.6% in stage 1, stage 2, Stage 3, Stage 4 COPD respectively.

CONCLUSION

COPD is characterized not only by airway inflammation but also by systemic inflammation.

Metabolic syndrome is a complex of interrelated medical disorders that increase the risk for type 2 diabetes and coronary artery diseases.

Systemic inflammation plays a key role in both COPD and metabolic syndrome. The coexistence of COPD and metabolic syndrome intensifies the systemic inflammation. Systemic inflammation is more severe in COPD patients with metabolic syndrome than in those without metabolic syndrome.

Early screening for metabolic syndrome in COPD patients is necessary so that early treatment can be started to decrease the incidence of major complications like coronary artery disease and cerebrovascular accidents in COPD patients.

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