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ASSESSMENT OF CRP AND ITS IMPORTANCE IN ESTABLISHED COPD PATIENTS – AN OBSERVATION STUDY

General Medicine

Dr. Mohammed Azfar Ali* MBBS, Consultant General Practitioner, Esani Diabetes Centre, Hyderabad, Telangana, India. *Corresponding Author

Dr. Sameena Fatima MBBS, Consultant General Practitioner, Esani Diabetes Centre,Hyderabad Telangana, India.

Dr. Mohammed Riyaz MBBS, MD (General Medicine) Consultant Physician, Esani Diabetes Centre, Hyderabad - 500008 Telangana, India.

ABSTRACT

Aim: Association of systemic inflammatory biomarkers with COPD has been studied by various authors. Present study aims to establish a relation between routinely used and cost effective markers and COPD.

Material and Methods: A total of 75 patients were enrolled only 50 patients were fitting the criteria. Diagnosis of COPD (chronic obstructive pulmonary disease) patients was based on spirometry and post bronchodilator FEV1/FVC <0.7 were selected as cases for the study and equal no of controls were selected with no history of SOB, use of bronchodilators and spirometry with post bronchodilator FEV1/FVC > 0.7.

Results: Total of 75 patients was screened, Only 50 patients were selected based on the criteria, 25 were case group and 25 are control group. The data obtained was analyzed using SPSS v 17. The mean age of study population was 52.59 ± 11.26 in case group and 52.50 ± 11.07 in controls p (>0.05). Case group comprised of 88% males and 12% females compared to 84% males and 16% females in controls (p>0.05). Mean BMI in cases was 20.90 ± 2.31 which was significantly lower than controls 22.06 ± 2.76, Mean CRP in cases was 4.67 ± 3.49 which was significantly higher than controls 0.454 ± 0.28 (p <0.05). There was a significant and positive correlation between smoking and severity of COPD (r = 0.471, (p <0.05).

Conclusion: Serum CRP is a reliable inflammatory marker with positive correlation to severity of COPD. Ease of availability of these cost effective markers in COPD helps in early intensification of therapy. It is concluded that use of biomarkers to establish systemic inflammation in COPD helps in both reflecting disease severity and assessing prognosis in patients.

KEYWORDS

C – Reactive Protein, Chronic Obstructive Pulmonary Disease, Smoking, Pulmonary function test, Systemic inflammatory markers,

INTRODUCTION:

Chronic obstructive pulmonary disease (COPD) is life threatening and progressive disease of lung. By the year 2020 it was speculated that COPD would be the most common cause of death and the trend in incidence is increasing and the over the past decade. It is well known that smoking of cigarette plays a very important role in the Pathogenesis of COPD, but the steps involved in its pathogenesis are still unclear. [1] Majority of patients with COPD usually develop emphysema of lung with its typical pattern involving destruction of alveolar and abnormal repair apart from inflammation of small airway which is persistent even years after cessation of smoking.[2-3]

Chronic obstructive pulmonary disease (COPD) is a multicomponent disease characterized by obstruction of airflow which is not completely reversible due to aberrant inflammatory reaction to aero toxins, smoke of cigarette, and fumes of biomass.[4] The obstruction of airflow can be a result of either disease of airways or destruction of alveolar (emphysema) and it is associated with loss of lean body mass, hypersecretion of mucus, and an increased risk of comorbidities. The progression and severity of disease can be assessed with the help of ratio of FEV_1 (forced expiratory volume)/ FVC. Lot of emphasis is laid on Biomarkers which could become relevant for early detection of disease, risk stratification of subjects and clinical trials endpoints.[4-7]

Association of systemic inflammatory biomarkers with COPD has been studied by various authors. Present study aims to establish a relation between routinely used and cost effective markers and COPD.

MATERIAL AND METHODS:

Total of 75 patients was screened , Only 50 patients were selected based on the criteria, 25 were case group and 25 are control group, A total of 25 COPD case group (chronic obstructive pulmonary disease) patients diagnosed based on spirometry and post bronchodilator FEV1/FVC <0.7 were selected as cases for the study and equal no of controls were selected with no history of SOB, use of bronchodilators and spirometry with post bronchodilator FEV1/FVC > 0.7. Patients with COPD were further classified based on severity based on GOLD guidelines as mild, moderate and severe obstruction. Both males and female between age group 30 – 70 yrs were enrolled for the study and Patients with airway disease other than COPD were excluded.

Inclusion Criteria:

1. Males and Female between 26yrs – 72yrs
2. Copd patients diagnosed based on spirometry and post bronchodilator FEV1/FVC <0.7 were selected as cases for the study.
3. Patients were clinically stable (no exacerbation for 2 months) at the time of evaluation.

Exclusion Criteria:

1. Age less than 25years and more than 73years
2. Patients with airway disease other than COPD
3. History of asthma
4. History of collagen vascular/autoimmune diseases,
5. History of Hepatic and Renal Disease.

The BMI was then calculated by dividing the weight in kilograms by height in meter square. Serum CRP levels were estimated in both groups.

RESULTS:

The data obtained was analyzed using SPSS v 17. The mean age of study population was 52.59 ± 11.26 in case group and 52.50 ± 11.07 in controls p (>0.05). Case group comprised of 88% males and 12% females compared to 84% males and 16% females in controls (p>0.05).

Mean BMI in cases was 20.90 ± 2.31 which was significantly lower than controls 22.06 ± 2.76, Mean CRP in cases was 4.67 ± 3.49 which was significantly higher than controls 0.454 ± 0.28 (p <0.05).

Patients were divided into nonsmokers and Smokers; smokers were further classified as ex-smokers and current smokers. It was observed that smokers contributed 88% of COPD cases compared to 56% on non-Controls. There was a significant and positive correlation between smoking and severity of COPD (r = 0.471, p <0.05).

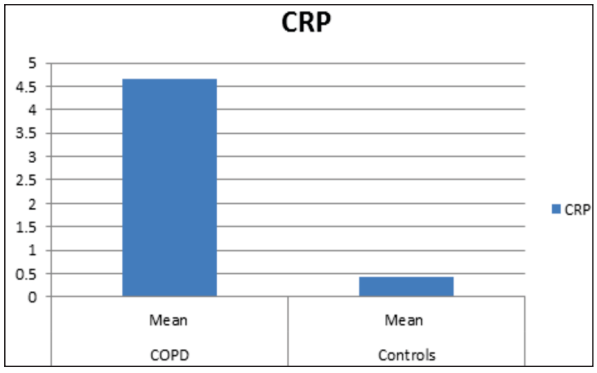
Table 1:

	COPD	Controls	
	Mean ±SD	Mean ± SD	p value
Age	52.59 ± 11.26	52.50 ± 11.07	0.981

BMI	20.90 ± 2.31	22.06 ± 2.76	0.027
CRP	4.67 ± 3.49	0.454 ± 0.28	<0.001

Table 2

	COPD	Controls	
	Mean ±SD	Mean ± SD	p value
Gender			
Males	22 (88 %)	21 (84%)	0.531
Females	3 (12%)	4 (16%)	
Non Smoker	3 (12 %)	9 (36 %)	0.002
Ex-smoker	10 (40 %)	5 (20 %)	
Current smoker	12 (48 %)	11 (44%)	



DISCUSSION:

COPD is a chronic obstructive lung disease; it is diagnosed based on Pulmonary Function test (PFT), Symptoms and History of previous episodes of Exacerbation. GOLD (Global Initiative for Chronic Obstructive Lung Disease) guidelines have been formulated based on the above criteria Based on airflow limitation GOLD system classification is as Follows In patients with FEV1/FVC <0.70:

- GOLD 1 –if FEV1≥ 80% predicted, it is considered as mild
- GOLD 2 – if 50% ≤ FEV1 < 80% predicted,it is considered as predicted moderate
- GOLD 3 – if 30% ≤ FEV1 < 50% predicted it is considered as severe
- GOLD 4 – if FEV1 <30% predicted. it is considered as very severe

Various biomarkers in COPD have been centered on proteins and on other molecules, such as in BAL, sputum, blood, urine. Profiling of various blood biomarkers have been identified that may help in distinguishing with people suffering from COPD versus control subjects, such as SP-D (surfactant protein-D), CC-16(lung-derived Clara cell protein-16), and CCL-18, extracellular matrix. However the availability of above markers for routine diagnostics is difficult.

In the Present study serum CRP was observed to be increased in patients with COPD and there was a positive correlation observed between CRO and COPD. It has also shown by various studies that increasing levels of serum CRP levels is associated with inflammation in atherosclerosis and also increasing the risk of Myocardial infarction and CHD (coronary heart disease). Large evidence suggests that even in stable COPD if there is an increased level of serum CRP levels it is associated with inflammation in lung. Hence serum CRP can be used as a marker in COPD patients with ongoing lung inflammation.

Gin et al(2004)had collected the data of five cross-sectional studies and have done the estimation of mean average increase of CRP in stable COPD. It was also concluded that Increased CRP was associated with all-cause mortality predominantly in patients with COPD (mild to moderate), Decline in FEV1, and in patients with diminished lung function.[8]

Randeep Guleria et.al (2011)has done a study on 93 patients of COPD with acute exacerbation who were on invasive mechanical ventilation were evaluated and these patients were investigated for CRP and Prealbumin levels.it was shown that patient who died had higher CRP and patients with low CRP and high prealbumin.[9]Dahl et.al. 2011 have also shown that elevated levels of CRP plays an important role in relation to outcome of patients in COPD and further subsequent hospital admission.[10]

Fisun et.al. 2008 study confirms that CRP levels can be used as a biomarker for low-grade systemic inflammation. Apart from this, it was also seen that CRP was significantly higher in COPD patients with a low BMI.[11].

CONCLUSION:

Serum CRP is a reliable inflammatory marker with positive correlation to severity of COPD. Ease of availability of these cost effective markers in COPD helps in early intensification of therapy. It is concluded that use of biomarkers to establish systemic inflammation in COPD helps in both reflecting disease severity and assessing prognosis in patients.

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