ORIGINAL RESEARCH PAPER

General Medicine

CRP LEVELS IN ACUTE BACTERIAL EXACERBATION OF COPD: ITS FOCUS ON MOLECULAR ETIOLOGY

KEY WORDS: CRP,COPD,

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ABSTRACT

Chronic obstructive pulmonary disease (COPD) has a high rate of morbidity and mortality worldwide. Exacerbations are heterogeneous events that are thought to be caused by complex interactions between the host, respiratory viruses, airway bacteria and environmental pollution. Recent studies have shown that bacteria play an important role in the exacerbation of COPD, and up to 50% of exacerbations are caused by bacterial infections.C-reactive protein (CRP) levels are useful in evaluating COPD exacerbation. CRP levels were higher in gram positive infections when compared to gram negative infections. High CRP levels can be used as biomarker for prediction bacterial exacerbation and prolonged hospital stay

INTRODUCTION

Chronic obstructive pulmonary disease (COPD) has a high rate of morbidity and mortality worldwide. Exacerbations are heterogeneous events that are thought to be caused by complex interactions between the host, respiratory viruses, airway bacteria and environmental pollution. Recent studies have shown that bacteria play an important role in the exacerbation of COPD, and up to 50% of exacerbations are caused by bacterial infections. C-reactive protein (CRP) levels are useful in evaluating COPD exacerbation. High serum levels of CRP are found in purulent bronchitis and COPD exacerbation with potential pathogenic microorganisms (PPMs) in the sputum. C-reactive protein (CRP) levels are useful in evaluating COPD exacerbation. High serum levels of CRP are found in purulent bronchitis and COPD exacerbation with potential pathogenic microorganisms (PPMs) in the sputum. Ninety three patients with acute exacerbations of COPD (AECOPD) were recruited from south Indian hospital. COPD was defined as forced expiratory volume in 1 second (FEV1) of < 80% predicted for age and height, and a ratio of FEV1-to-forced-vital-capacity of <70%.

Exacerbation was considered if the patient had a background COPD with a combination of worsening respiratory symptoms including shortness of breath, a change in volume and color of sputum, cough, wheeze or systemic symptoms

Inclusion Criteria

- -Age >18 years of age
- -Patient with bacterial exacerbation of COPD. Bacterial exacerbation was defined by van der Valk et al as follows:
- -1) The abundance of >= 1 PPMs in excess (>= logof the normal
- microbiological flora in sputum
- -2) PPMs reaching a level of absolute growth of >106 colony-forming units per milliliter, except for Streptococcus Pneumoniae, for which a level of growth of >105 colony-forming units per milliliter was sufficient

Exclusion Criteria

- History of asthma-Bronchiectasis, tuberculosis, malignancies
- -Any other inflammatory diseases arthritis, connective tissue disorders orinflammatory bowel disease.
- -Infiltrates on chest x-ray examination were diagnosed as having pneumonia and Patients with pneumonia were also excluded.

Statistical Analysis

The data were analyzed using SPSS 11.5 software (SPSS Inc, Chicago, IL). Categorical variables were compared using the univariate analysis, and continuous variables using the Student's t test or the Mann-Whitney's U test.

RESULTS

Of the 93 hospitalized patients with COPD, 90 were selected for evaluation. The remaining 3 patients were excluded because of the absence of CRP measurements on the day of admission and sputum culture contamination. Baseline characteristics of patients with acute exacerbations of chronic obstructive pulmonary disease (COPD). Among all identifiable pathogens Klebsiella pneumonia and staphylococcus species were most common isolated gram negative and gram positive organism respectively Median CRP levels for gram positive and gram negative organism were 62.84mg/dl And 40.86mg/dl respectively. There was statistically significant differences in median CRP levels for gram positive and gram negative pathogens, with median CRP levels higher in gram positive pathogens and p value was <0.5. Patient with high CRP level were noted in older age group (age >65 years), duration of copd more than 5 years, male gender, Univariate and multivariate logistic regression analysis was applied and showed it to be statically significant.

Patient with high CRP levels had longer duration of stay in the hospital when compared to patient with low CRP levels and statically significant

Parameters	N (%)	CRP		Univariate analysis P value
		High	Low	
Age group				
>65 years	39	25	14	0.007
<65 years	51	44	9	
Gender				
Male	65 ()	53	12	0.032
Female	27 ()	16	11	
Duration of COPD				
<5 years	40	32	8	0.006
>5 years	52	37	15	
Diabetes mellitus				
Yes	25	19	6	0.431
No	67	17	50	
Hypertension				
Yes	28	21	7	0.381
No	64	48	16	
Smoking				
Yes	47	36	11	0.165
No	45	33	12	
Cough with expectoration				
Yes	80	60	20	0.678
No	12	9	3	
Fever				
Yes	34	28	6	0.229
NO	58	41	17	
High TLC COUNT				
Yes	53	41	12	0.137
No	39	28	11	
Gram Stain				
Positive	22	20	2	0.046
Negative	69	49	20	
Duration of Hospital stay				
>7 days	28	17	11	0.008
<7 days	64	52	12	

DISCUSSION

In this study, our results suggest that High CRP level is a good potential biomarker for the diagnosis of bacterial infections-caused by gram positive organism, especially in patients with AECOPD . Klebsiella pneumonia, the most common causative agent in our geographic area, played a major role in 30% of exacerbations, whereas staphylococcus species occurred in 15.5% of exacerbations in our study, which was different from

other studies. This discrepancy may be because of distinct antibiotic pressure in different geographic areas and the exclusion of patients with pneumonia. There was significant difference in the CRP values among the different pathogens in patients with AECOPD was observed in these studies. Gram positive pathogens had high CRP levels when compared to gram negative organisms. And patient with high CRP levels had long duration of hospital stay when compared with the rest.

CONCLUSIONS

CRP levels were higher in gram positive infections when compared to gram negative infections. High CRP levels can be used as biomarker for prediction bacterial exacerbation and prolonged hospital stay.

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