Original Research Article

Study of C-reactive protein in respiration tract infections in Telangana patients

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Abstract

Background: C-reactive protein being an acute phase protein rises in pneumonia and may be helpful in differentiating patients with lung parenchyma infection from patients with infection sequested to the bronchial tree. **Method:** Out of 500 patients 380 had pneumonia, 180 had COPD with acute exacerbation were studied. Serum CRP levels and other traditional biomarkers of infections and crest x-ray was studied. **Results:** Mean CRP in pneumonia was 76.87 (± 11.1) and Mean CRP value was 16.7 (± 9.2) and t test was 65.05 and p< 0.00. In pneumonia 204 (± 64.3%) had CRP value up to 50, 70 (± 21.8%) had 50-100 CRP value, 32 (± 10.1) had 100-150 CRP value and 4 (± 1.25%) patients 551-600 CRP. In COPD with acute exacerbation patients 175 (± 97%) had up to 50 CRP value only 5 (± 2.7%) had 50-100 CRP value. **Conclusion:** This study shows variation in CRP values in both different respiratory infections. CRP values useful adjective test in pneumonia patients which differ from COPD with different CRP value. Apart from diagnostic value CRP value also useful in differential diagnose in respiratory infections.

Keywords: Latex agglutation test, Humatex CRP, COPD, Pneumonia, Telangnana

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INTRODUCTION

CRP is an acute phase protein synthesized in liver. It was first described by Tillet and Francies Jr. in 1930. They described it as serum factor responsible for precipitation of acute phase sera with C-substance of pneumococcal cell wall. It is so named because of C-polysaccharide of streptococcus pneumonia. CRP is 120,000 to 140,000 molecular weight pneumatic proteins comprising of five identical monocovalently bound subunits arranged in cyclic symmetry on simple plane.[1] CRP has two major biological roles. It is known to activate the complement system and able to modify the function of phagocyte leucocytes.[2] These effects support the concept that this serum protein may have potential control role in host defence mechanisms. Its production in mainly by interleakin-6, interleakin-1β and tumour necrosis factor in response to infection or tissue infections is not proved.[3,4] Though CRP levels rose as results of tissue injury or inflammation, it is not specific for any particular disease and its measurements help us to diagnose and monitor the disease progression as well as therapeutic response. Hence attempt is made to study to evaluate the respiratory tract infections i.e. pneumonia and COPD and compared the severity to treat as per the severity and to know the therapeutic response in adults of both sexes.

MATERIAL AND METHOD

500 hundred adult patients aged between 20 to 58 years regularly visiting to medicine department of Mamata Medical College hospital Khammam-507002 Telangana were studied.

Inclusive Criteria: Patients with respiratory tractions more than 15 days having cough, pneumonia were included in the study.

Exclusion Criteria: Patients with malignancy of lungs, immune compromised patients and already under treatment with oral corticosteroids Myocardial infarction

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pulmonary oedema, pulmonary infarction, collagen vascular disorder and liver disease were excluded from study.

Method: Previous history and occupation of every patient was recorded. Chest x-ray was taken to confirm the diagnosis, Blood examination included CBC, ESR, Sputum for AFB, RBS, was studied. A serum sample was preserved at the time of presentation for measuring the CRP. CRP was measured in neat (undiluted) sera and in dilatation of 1/10, 1/20, 1/30, 1/40, 1/60, 1/80, 1/100 using commercially available latex agglutation test (Humatex CRP). The value of CRP was calculated y multiplying the denominator of the dilution by six to get the value in mg/1. The mid-value of the positive and negative titre was used in the calculation. The duration of study was may-2020 to June-2021

Statistical analysis: The obtained results of pneumonia and COPD exacerbation CRP values were studied with percentage and CRP values in both groups were compared with z test. The statistical analysis was carried out in SPSS software. The ratio of the male and female was 2:1.

This research paper was approved by Ethical committee of Mamata Medical College Khammam – 507002, Telangana.

OBSERVATION AND RESULTS

Table 1: Distribution of patients of Respiratory tract infections Table-1 320 (64%) pneumonia, 180 (36%) COPD with acute exacerbation

Table 2: Comparison CRP values in both groups of respiration trace infection mean values CRP 76.87 (± 11.1) in pneumonia, 16.71 (± 9.2) in COPD with acute exacerbation t test was 65.05 and (p<0.00) p value was highly significant.

Table 3: Distribution of CRP values in both groups of respiratory that infection

In. Pneumonia – 206 (± 64.3%) patients had up to 50 CRP value, 70 (± 21.8%) had 50-100 CRP value, 32 (± 10%) had 150-200 CRP value, 4 (± 1.25) patients had 201-250 CRP value, 4 (± 1.25) had 251-500, 4 (± 1.25) had 551-600 CRP. In COPD with acute exacerbation patients- 175 (± 97.2%) had up to 50 CRP value, 5 (± 2.7%) had 100-150 CRP value.

Table 1: Distribution of patients of Respiration tract infection

Infection	No. of patients (500)	Percentage (%)
Pneumonia	320	64
COPD with acute exacerbation	180	36

Table 2: Comparison of CRP values in both groups of respiratory infections

Group	No. of patients	Mean value of CRP	t test	p value
Pneumonia	320	76.87 (± 11.1)	65.05	P<0.00
COPD with acute exacerbation	180	16.71 (± 9.2		

P value is highly significant (p<0.00)

Table 3: Distribution of CRP values in patients of respiratory tract infeca

Values of CRP (mg/L)	No. of Pneumonia patients (320)	Percentage (%)	No. of COPD 180	Percentage
0-50	206	64.3	175	97.2
50-100	70	21.8	5	2.7
100-150	32	10		
150-200	--			
201-250	4	1.25		
251-550	4	1.25		
551-600	4	1.25		
Total	**320**		**180**	

Pneumonia patients had different values of CRP from 50-100 and COPD with acute exacerbation only up to 50 and up to 100 CRP value.

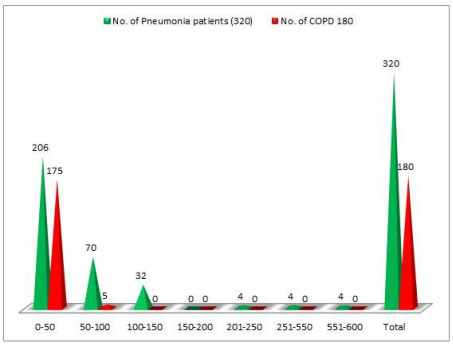

Table 1: Distribution of CRP values in patients of respiratory tract infection

DISCUSSION

In the present study of CRP value in respiratory tract infections 320 (64%) had Pneumonia, 180 (36%) had COPD with acute exacerbation (Table-1). In the comparative study of CRP value in both groups 76.87 (±11.1) in pneumonia, 16.71 (± 9.2) in COPD with acute exacerbation patients and t test was 65.05 and p<0.00 p value was highly significant (Table-2). In pneumonia had different range of CRP values, from 50 to 600 while COPD with acute exacerbation had only 50 to 100 CRP values (Table-3). These findings are more or less in agreement with previous studies.[5,6,7] CRP (C-reactive protein) is a non-specific acute phase serum protein and a useful biomarker for defection of inflammation and various active infections.[8] It has been shown to be beneficial in the clinical evaluation of respiratory tract. Infection with fever in adults as well as in children was observed. Additionally an elevated CRP has been used as indication to initiate antibiotics therapy.[9] C-reactive protein is an indication of pathology and disappearance of C-reactive protein is concomitant with effectiveness of drugs used in the treatment. This study was blinded comparison of chest radiographs with general practitioner assessed diagnosis pneumonia by chest radiography. The classical symptoms and signs of pneumonia were dyspnoea, thoracic pain, self reported fever, respiratory rate > 20/min, percussion, dullness, crackles, were not predictive of pneumonia. The final symptoms and signs model used to predict pneumonia included variables dry cough, diarrhoea and temperature 38°C plus ESR rate or C-reactive protein best predicted pneumonia. Thus prediction rule for patients at low risk of pneumonia, including a CRP value > 20 mg/L can reduce antibiotic over prescribing in general practice. The most common pathogens were streptococcus pneumonia, viruses, and Chlamydia pneumonia followed by mycoplasma pneumonia, Legionella pnemophila and coxiella brunette. Lower levels of CRP were found in pneumonia caused by viruses and C brunette as well as in negative microbiological findings. The median CRP levels in hospitalised patients were significantly higher than out patients.[10] The researchers concluded that, the serum CRP is level useful markers for establishing the diagnosis of community acquired pneumonia in adult's patients with lower respiratory tract infections. CRP values are especially high in patients with pneumonia caused by S. pneumonia or L. Pneumonia. Moreover high CRP values are suggestive of severity, which may be of values suggestive of value in deciding about the appropriateness of inpatient care.[11]

SUMMARY AND CONCLUSION

The present study of CRP values in respiratory tract infection. Highly significant differences were observed between pneumonia and COPD with acute exacerbation. No relationship between CRP value and organism could be found. Though no cut off value could be found to differentiate the two groups of infections but a value of more than 50 mg/L went in favour of pneumonia. Hence in the particular clinical setting, CRP could probably be an important parameter to differentiating doubtful cases, but this study demands further patho-physiological, pharmacological, genetic, immunological, nutritional studies because exact mechanism of elevation of C-reactive protein in response to specific pathogenesis is still unclear.

Limitation of Study

Owing to the non-availability of latest techniques and remote location of our institution we have limited findings.

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