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Original Research Article

To Study the Correlation Of hsCRP, CURB65 and Pneumonia Severity Index Score with Severity and Outcome in Patients with Pneumonia

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Abstract: Pneumonia is an infection ofpulmonary parenchyma, it is an inflammatory cell in alveolar spaces of lungs by infection, and most commonly is by aspiration from oropharyengeal. It can result from variety of causes including infection with bacteria, viruses' fungi, parasites and chemical and physical injury to lungs.CRP is an acute phase protein levels of which rise in response to inflammation. The present study was undertaken with objectives-to study the hs CRP levels in patient of pneumonia and to study CURB 65 and PSI Score in patient of pneumonia.A cross-sectionalstudy was conducted in department of medicine, Muzaffarnagar Medical College, Muzaffarnagar, having100 patients of pneumonia registered at MMCbetween 1st April 2014 to 31st March 2015.CURB 65 and PSI score were calculated for each patient to stratify into their respective risk class hs CRP LEVELS were measured on day 1 and again on day 5 and 7. High admission hsCRP>70 mg /l were effectively predicts poor out come and severe community acquired pneumonia.
Keywords:hsCRP, CURB65, PSI

INTRODUCTION:

Pneumonia is an infection of pulmonary parenchyma. It is an inflammation of cells in alveolar spaces of the lungs by infection. It results in proliferation of microbial pathogens at the alveolar level and hosts response to those pathogens [1]. The inflammatory response and disturbance of gas exchange caused by alveolar involvement are responsible for clinical manifestation. Typical symptoms associated with pneumonia include cough, chest pain, fever and difficulty in breathing [2]. Diagnostic tools include x-ray and examination of sputum and treatment involves use of antibiotics.CPR is an acute phase protein level of which rise in response to inflammation. Its role is to bind the phospocholine receptors expressed on the surface of dead and dying cells and some of bacteria in order to activate complement system. CURB 65 is clinical prediction rule that was validated for predicting mortality in CAP [3].

MATERIAL AND METHODS:

The study was conducted in the department of Medical Muzaffarnagar Medical College, Muzaffarnagar after being approved by the ethical committee of the institute and after taking informed consent from the patients. A total of 50 patients of pneumonia were enrolled in the study.

Inclusion criteria:

Patient of pneumonia who were
-12 year and older of either sex

Exclusion criteria:

Patients with
-Acute inflammatory condition other than pneumonia.
-Assicuated chronic medical illness whichmaylead to rise in hsCRP.
-Coronary artery disease
-Autoimmune disorders
-Chronic kidney disease

METHODS

Hundred patients of pneumonia were enrolled in the study. A detailed history and a though physical examination was done. Investigations including hematology, biochemistry, sputum and blood culture, chest x-ray were done. CURB65 and PSI score were

calculated within first 48 hours of admission. HsCRP levels were measured by ELISA method. The repeat hsCRP levels were measured day 5 to 7. The hsCRP levels were correlated with the clinical features, scores and outcome of the patients.

PRINCIPLE OF THE TEST:

The principal of the following enzyme immunoassay test follows a typical two-step capture or 'sandwich' type assay. The assay makes use of two highly specific monoclonal antibodies: A monoclonal antibody specific for CRP is immobilized onto the micro well plate and another monoclonal antibody specific for a different region of CRP is conjugated to horse radish peroxidase (HRP) [4]. CRP from the unknown and calibrators are allowed to bind to the plate, washed, and subsequently incubated with the HRP conjugate.

OBSERVATIONS AND RESULTS:

The study was conducted in 100 patients of pneumonia who presented in medicine emergency, Muzaffarnagar Medical College & Hospital. Detailed history was taken from all the patients and through clinical examination was done Emergency haematological and biochemical investigations along with blood cultures and sputum cultures were sent. Chest x-ray and arterial blood gas analysis was done. CURB65 and PSI scores were calculated for each patient to stratify into their respective risk class. HsCRP levels were measured on day 1 and again between days 5 to 7.

Table 1: Age distribution of patients

AGE GROUPS	NO. OF PATIENTS
</=20	12
21-30	13
31-40	16
41-50	12
51-60	18
>/=60	24
Total	100

Age of the patient ranged from 13 to 85 years.

Table 2: Gender distribution of patient

GENDER	NO. OF PATIENTS
Male	64
Female	36
Total	100

Thirty Six patients out of Hundred were female and Sixty Four were males.

Table 3: Categorization of patients according to mental state

MENTAL STATE	NO. OF PATIENTS
Conscious	88
Confused	12
Total	100

Twelve patient out of Hundred, confused at arrival in emergency, whereas remaining Eighty Eight, conscious

Table 4: Description of vital signs of the patients

	PULSE	SBP	DBP	RR	TEMP
No. of Patients	100	50	50	50	50
Minimum	80	70	40	14	100
Maximum	139	130	80	36	106

Vitals of the patients were recorded at their presentation. Pulse of the patient ranged from the minimum of 80 to maximum of 139. Systolic blood pressure ranged from a minimum of 70mm of hg to a maximum of 130. The minimum diastolic blood pressure recorded was 40mm of hg and maximum of 80. Respiratory rate of the patients ranged from minimum of 14 per minute and maximum of 36 per minute. Temperature ranged from minimum of 100^0 F to a maximum of 106^0F.

Table 5: Hemoglobin characteristic of the patients

NO OF CASES	MINIMUM	MAXIMUM	RANGE	MEAN	MEDIAN
100	6.4	16.5	10.1		

Haemoglobin of the patients ranged from a minimum of 6.4g% to maximum of 16.5%.

Table 6: Blood investigation in emergency

	HCT	TLC	RBS	B.U.	Sr. CREAT	S. Na	pH	PO_2
No. of cases	100	100	100	100	100	100	100	100
Minimum	18	2420	64	19	0.6	102	6.86	46.5
Maximum	54	53400	260	256	9.0	145	7.5	97.0

The haematocrit of the patients ranged from a minimum of 18 per cent to a maximum of 54. Total leucocyte count of the patients ranged from a minimum of 2420 per dl to maximum of 53400 per dl. The minimum random blood sugar recorded was 64 and the maximum being 260mg/dl. The maximum blood urea recorded was 256 mg/dl and the minimum recorded was 19mg/dl. Serum creatinine concentrations ranged from minimum of .6mg/dl to a maximum of 9 mg/dl. Serum sodium levels recorded was a minimum of 102 meq/L to a maximum of 145meq/L. The minimum ph recorded was 6.86 to maximum of 7.5. The minimum PO_2 recorded was 45.5 and maximum was 97.

Table 7: Description of pleural effusion

PLEURAL EFFUSION	NO. OF PATIENTS
Present	36
Absent	64
Total	100

Chest x-ray revealed pleural effusion in about Thirty Six of Hundred patients of pneumonia.

Table 8: day 1 hs CRP (hsCRP1) and day 5-7 hsCRP (hsCRP2)

	HsCRP1	HsCRP2
No. of patients	100	100
Minimum	65.32	10.20
Maximum	98.90	99.9

The minimum hsCRP concentration on day 1 was 65.32 mg/L and maximum was 98.9 mg/L. The minimum hsCRP concentration on day 5-7 was 10.2 mg/L and maximum was 99.90mg/L.

DISCUSSION:

C-reactive protein is an acute phase protein synthesized by the liver in response to tissue damage. Interleukin-6 (IL-6) is thought to be the primary trigger of CRP release, although tumor necrosis factor (TNF)-alpha, IL-1, and other cytokines are thought to be involved. Studies of cytokines and inflammatory markers in community-acquired pneumonia have not translated into clinically useful tests, in part because TNF-alpha and interleukin-6 are detectable in only minority patients [5]. Evidence of a relationship with severity has been conflicting, with some studies who ing that TNF-alpha, IL-6, and soluble interleukin-2 receptor (IL-2R) do not correlate with severity [6]. Others, however, have shown that IL-6 levels correlate with British Thoracic Society severity score and that IL-6 and IL-10 (an anti-inflammatory cytokine) correlate with Apache II score and are higher inpatients fitting the systemic inflammatory response syndrome criteria compared with patients who do not TN alpha, IL-6, and IL-1 beta levels appear also to be higher inpatients admitted to the Intensive Care Unit with pneumonia compared with those with less severe pneumonia [7]. As these cytokines are the primary stimulus for C-reactive protein release, it should seem to follow that CRP also should be higher in patients with severe pneumonia [8]. Despite this, there are not studies of larger magnitude examining CRP and mortality in community-acquired pneumonia [9]. However studies have shown that elevated CRP in community-acquired pneumonia in independently associated with requirement for inpatient care, and that higher CRP levels result in longer duration of hospital stay and poorer clinical and radiological recovery [10]. Elevated CRP also has been shown to be associated with increased mortality in lower respiratory tract infection.

CONCLUSIONS AND RECOMMENDATIONS:

High admission hsCRP >70 mg/L effectively predicts poor outcome in severe community-acquired pneumonia and can be used as an adjunct to clinical judgment for identifying high-risk patients who need admission [11].

1. The time course characteristics of hsCRP, unlike other cytokines, make it ideally suited for use as a peripheral marker in pneumonia.
2. Consecutive C-reactive protein measurements are useful in the first week in follow-up of antibiotic treatment for severe community-acquired pneumonia.
3. A delayed decline in C-reactive protein levels is associated with a higher risk of having received inappropriate antibiotic treatment.
4. In patients admitted to the hospital, a CRP level that falls by 50% or more in 4 days indicates a low risk of 30-day mortality, need for mechanical ventilation and/or inotropic support, or the development of complicated pneumonia.
5. The use of scoring systems offers the clinical and adjective tool when making site-of-treatment decision for patients and when stratifying patients with CAP into risk groups.
6. The CURB-65, with just five variables, in probably the easiest to remember and apply, although it is less accurate at predicting adverse outcomes. CURB-65 seemed superior when quicker decisions were paramount.
7. The addition of co-morbidities into PSI increases its sensitivity to identify patients at risk and deciding site of care. PSI is also an accurate scoring system to predict morbidity in terms of requirement of ICU admission and mechanical ventilation.

REFERENCES:

1. Baudouin; The pulmonary physician in critical care. 3: Critical care management of community acquired pneumonia, Thorax 2002; 57(3): 267-71.

2. Lim WS, Woodhead M; British Thoracic Society adult community acquired pneumonia audit 2009/10. Thorax 2011; 66(6): 548-9.
3. Niederman MS, Mandell LA, Anzueto A, Bass JB, Broughton WA, Campbell GD, *et al.;* American Thoracic Society Guidelines for the management of adults with community-acquired pneumonia. Diagnosis, assessment of severity, antimicrobial therapy, and prevention. Am J Respir Crit Care Med. 2011; 163(7): 1730-54.
4. Kalpan V, Angus DC, Griffin MF, Clermont G, Scott Watson, R Linde-Zwirble WT; Hospitalized community-acquired pneumonia in the elderly: age-and sex-related patterns of care and outcome in the United States. Am J Respir Crit Care Med. 2002; 165(6):766-72.
5. Feinsilver SH, Fein AM, Niederman MS, Schultz DE, Faegenburg DH; Utility of fibrotic bronchoscopy in nonresolving pneumonia. Chest 1990; (6):1322-6.
6. Fernandez-Serrano S, Dorca J, Coromines M, Carratala J, Gudiol F, Manresa F; Molecular inflammatory responses measured in blood of patients with severe community-acquired pneumonia. Clin Daign Lab Immunol. 2003; 10(5):813-20.
7. Smith RP, Lipworth BJ, Cree IA, Spiers EM, Winter JH; C-reactive protein. A clinical maker in community-acquired pneumonia. Chest 1995; 108(5):1288-91.
8. Vigushin DM, Pepys MB, Hawkins PN; Metabolic and scintigraphic studies of radioiodinated human C-reactive protein in health and disease. J Clin Invest. 1993; 91(4):1351-7.
9. Povoa P; C.-reactive protein; a valuable marker of sepsis. Intensive Care Med. 2002; 28(3):235-43.
10. Seppa Y, Bloigu A, Honkanen PO, Miettinen L, Syrjala H; Severity assessment of lower respiratory tract infection in elderly patients in primary care. Arch Intern Med. 2001; 161(22):2709-13.
11. Beat Muller, Stephan Harbarth, Daiana Stolz, Roland Bingisser, Christian Mueller, JogLeuppi, *et al.;* Diagnositc and prognostic accuracy of clinical and laboratory parameters in community-acquired pneumonia, BMC Infectious Diseases 2007; 7:10.