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C-REACTIVE PRTEIN (CRP) LEVELS ASSOCIATION WITH ICU ORGAN FAILURE IN CRITICALLY ILL PATIENTS

Medicine

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ABSTRACT

C-reactive protein (CRP), an acute-phase protein synthesized by the liver following stimulus by various cytokines markedly increase within hours after infection or inflammation.

A prospective cohort study was conducted in a Emergence medical ward in a Hamidia Hospital, Bhopal (M.P.) India .Aim of study was to study the association between early serum CRP concentrations and the development of organ failure .Patient were divided in 3 groups based on CRP at time of admission. In gp 1 CRP <1mg/dl, gp2 1-10mg/dl & gp 3 >10mg/dl.Cardiovascular, respiratory , renal and coagulation failure statistically significant increased in group 3 than 1 at time of admission(p<.05). We have evaluated that their is correlation of CRP levels with organ failure after ICU admission in a heterogeneous group of ICU patients with different disease.

KEYWORDS

C-reactive protein,ICU patients,Organ Failure

INTRODUCTION-

Multi organ failure is major cause of death in intensive care unit patient[1-2]. A few studies have suggested that CRP may be an indicator of organ failure[3-7]. Pinilla et al[3] demonstrated a strong correlation between the ratio of CRP to prealbumin and the severity of organ dysfunction in critically ill patients. Other investigators have reported CRP levels to be associated with multiple organ dysfunction in patients with acute pancreatitis[5-7].

MATERIAL AND METHOD

The study was conducted in the Departments of Medicine at Gandhi Medical College & Hamidia Hospital, Bhopal from April 2010 to Nov 2011. The study subjects selected from patients who are admitted in the emergency medical wards at Hamidia Hospital.Patient were divided in 3 groups based on CRP at time of admission. In gp 1 CRP <1mg/dl, gp2 1-10mg/dl & gp 3 >10mg/dl.

TYPE OF STUDY

Prospective cohort study

Inclusion Criteria

Patients with acute inflammatory condition like Myocardial Infarction, STROKE,SYSTEMIC INFLAMATORY RESPONSE SYNDROME SEPISIS AND OTHER CRITIECAL ILLNESS.

Exclusion Criteria

1. Patient with alcohol consumption more than 20 gm per day.
2. Patient with chronic inflammation like rheumatoid arthritis, gout. Infection was diagnosed according to usual clinical, laboratory, and microbiological parameters.

The APACHE (acute physiologic and chronic health evaluation) II score was calculated on ICU admission. Organ function was evaluated according to the sequential organ failure assessment (SOFA) score. For each of the six organ systems included in the SOFA score (respiratory, cardiovascular, neurologic, renal, hematologic, and hepatic), organ failure was defined as a score of six.

Organ dysfunction defined on basis of SOFA score

The Sequential Organ Failure Assessment (SOFA) Score

SOFA Score	0	1	2	3	4
Respiration PaO_2/FiO_2 (mmHg) SaO_2/FiO_2	> 400	< 400 221-301	< 300 142-220	< 200 67-141	< 100 < 67
Coagulation Platelets $10^3/mm^2$	> 150	< 150	< 100	< 50	< 20
Liver Bilirubin (mg/dL)	< 1.2	1.2-1.9	2.0-5.9	6.0-11.9	> 12.0
Cardiovascular Hypotension	No Hypotension	MAP < 70	Dopamine </=5 or Dobutamine (any)	Dopamine > 5 or Norepinephrine < / =0.1	Dopamine > 15 Norepinephrine > 0.1
CNS Glasgow Coma Score	15	13-14	10-12	6-9	< 6
Renal Creatinine(mg/dL) Urine output (ml/d)	< 1.2	1.2-1.9	2.0-3.4	3.5-4.9 or < 500	> 5.0 or < 200

STATISTICAL ANALYSIS

All the patient divided in three groups based on their CRP at time of admission. The data for all the groups are expressed as mean ± SD. Continuous variables were compared with analysis of variance for repeated measurements. Proportions were compared using the Z test. Chi square test was done to determine the significance of association of organ failure with CRP. A p value 0.05 was considered statistically significant

OBSERVATIONS-

Table 1 Incidence Of Organ Failure (sofa Score 3 Or 4) On Icu Admission (day 0) According To Crp Level

Variables	Day 0	Group-I (CRP< 1 mg/dL)		Group-II (CRP 1-10 mg/dL)		Group-III (CRP > 10 mg/dL)	
		No.	%	No.	%	No.	%
CRP Measurements	0	35	33	33		26	
Respiratory	0	9	25.71	15	45.45	15	57.69!
Renal	0	1	2.85	3	9.09	6	23.07!
Coagulation	0	0	0	1	3.03	4	15.38!
Cardiovascular	0	3	8.57	4	12.12	6	23.07!
Liver	0	1	2.85	1	3.03	2	7.69
Neurological	0	6	17.14	7	21.21	7	26.9

CRP LEVELS – Organ failure in critically ill Data are presented as no. & percentage

! p <.05 Vs Group 1

# p <.05 Vs Group 2

Cardiovascular, respiratory ,renal and coagulation failure statistically significant increased in group 3 than 1 at time of admission(p<.05).

RESULTS-

Organ failure its correlation with CRP:

The number of organs failing during the ICU stay increased with increasing CRP concentrations, both at ICU admission and at 48 h.

Coagulation failure : The incidence of coagulation failure was directly proportional to ICU admission CRP levels. Coagulation failure was not in patients with ICU admission CRP concentrations >1 mg/dL; it was 3.03% for patient CRP levels in the range of 1 to 10 mg/dL, and 15.38% for patient ICU for admission CRP values > 10 mg/dL[p<.05] .

Respiratory and cardiovascular dysfunction: At admission, CRP levels>10 mg/dL were associated with a significantly higher incidence of respiratory cardiovascular and renal dysfunction than CRP levels < 1 mg/dL

DISCUSSION-

The correlation of CRP levels with organ failure and early mortality after ICU admission has been evaluated in a heterogeneous group of ICU patients. This is found that increased CRP concentrations were associated with organ failure,

Gian P Castelli[[8] CRP levels are related to the severity of organ dysfunction.

Lobo SM[9], **C-reactive protein levels correlate with mortality and organ failure in critically ill patients**

Coagulation failure was not found in patients with ICU admission CRP concentrations <1 mg/dL. It was 3.03% for patient CRP levels in the range of 1 to 10 mg/dL, and 15.38% for patient ICU for admission CRP values > 10 mg/dL similar result obtained by suzana et al coagulation failure increased as CRP increase.

Respiratory and cardiovascular dysfunction :on admission CRP levels > 10 mg/dL were associated with a significantly higher incidence of respiratory and cardiovascular dysfunction than CRP levels <1 mg/dL (Table 1). Similar finding got by Mradul Kumar Daga[10] et al in their study in pneumonia patient.

Mendall MA, Strudy achan DP, Butland BK, et al.[11] also got similar result increase C-reactive protein: associated with increased cardiovascular mortality .

Liver failure not significantly associated with increased CRP level in different group this according to existing literature as Silvestre JP[12] et al also got similar finding in their study on liver failure patient.

CONCLUSION-

We have evaluated that their is correlation of CRP levels with organ failure except for liver failure after ICU admission in a heterogeneous group of ICU patients with different disease.

REFERENCES-

1. Tran DD, Groeneveld ABJ, Vander Meulen J, et al. Age, chronic disease, sepsis, organ system failure, and mortality in a medical intensive care unit. Crit Care Med 1990; 18:474– 479
2. Kollef MH, Sherman G. Acquired organ system derangements and hospital mortality: are all organ systems created equally? Am J Crit Care 1999; 8:180–188
3. Pinilla JC, Hayes P, Laverty W, et al. The C-reactive protein to prealbumin ratio correlates with the severity of multiple organ dysfunction. Surgery 1998; 124:799–805
4. Waydhas C, Nast-Kolb D, Trupka A, et al. Posttraumatic inflammatory response, secondary operations, and late multiple organ failure. J Trauma 1996; 40:624–630
5. Ikei S, Ogawa M, Yamaguchi Y. Blood concentrations of polymorphonuclear leukocyte elastase and interleukin-6 are indicators for the occurrence of multiple organ failures at the early stage of acute pancreatitis. J Gastroenterol Hepatol 1998; 13:1274–1283
6. de Beaux AC, Goldie AS, Ross JA, et al. Serum concentrations of inflammatory mediators related to organ failure in patients with acute pancreatitis. Br J Surg 1996; 83:349–353
7. Rau B, Steinbach G, Baumgart K, et al. Serum amyloid A versus C-reactive protein in acute pancreatitis: clinical value of an alternative acute-phase reactant. Crit Care Med 2000; 28:736–742 Castelli GP
8. ,Pognani C,Cita M,Stuani A,Sgarbi L,Paladini R. C-reactive protein as an indicator of bacterial infection of adult patients in the emergency department.
9. Suzana M. A. Lobo, MD; Francisco R. M. Lobo, MD; Daliana Peres Bota, MD; Flavio Lopes-Ferreira, MD; Hosam M. Soliman, MD; Christian Me´lot, MD, PhD; C-Reactive Protein Levels Correlate With Mortality and Organ Failure in Critically Ill Patients.
10. Mradul Kumar Daga, Navanshu Arora, S Krishna Prakash, Rajat Jhamb, Naresh Kumar1, Neera Gupta C-reactive protein in lower respiratory tract infections
11. Mendall MA, Strachan DP, Butland BK, Ballam L, Morris J, Sweetnam PM, Elwood PCC-reactive protein: relation to total mortality, cardiovascular mortality and cardiovascular risk factors in men.
12. Silvestre JP, Coelho LM, Póvoa PM Impact of fulminant hepatic failure in C-reactive protein.