ejpmr, 2022,9(8), 421-423

SJIF Impact Factor 6.222

EUROPEAN JOURNAL OF PHARMACEUTICAL AND MEDICAL RESEARCH

www.ejpmr.com

Research Article

ISSN 2394-3211

EJPMR

COMPARATIVE STUDY OF SERUM CRP LEVELS VS APACHE –II SCORING SYSTEM IN DETERMINING SYSTEM THE SEVERITY OF ACUTE PANCREATITIS

Malik Shahnaz[1], Snober Malik[2], Amat us Sami*[3], Sheeba Altaf[4], Naveed Bashir[5]

[1]Consultant Surgeon, Directorate of Health Services, Kashmir.
[2]Consultant Gynaecologist, Directorate of Health Services, Kashmir.
[3]Consultant Surgeon, Directorate of Health Services, Kashmir.
[4]Medical officer, Directorate of Health Services, Kashmir.
[5]Consultant Orthopaedician, Directorate of Health Services, Kashmir.

***Corresponding Author: Dr. Amat us Sami**

Consultant Surgeon, Directorate of Health Services, Kashmir.

Article Received on 09/06/2022 **Article Revised on 30/06/2022** **Article Accepted on 21/07/2022**

ABSTRACT

Background: Acute pancreatitis (AP) is a common digestive disease and the most frequent disorder of the pancreas. In third world settings, a simple scoring system predicting severity and outcome can help in improving outcome of these patient. In this regard a study was conducted to determine whether APACHE or CRP will help in developing a better scoring system for predicting outcome and severity. **Results:** On comparing serum CRP level > 150 mg/L with an APACHE II score of > 8, to predict a severe attack, it was seen that the former had a higher sensitivity, negative predictive value and overall accuracy compared to the latter. Again it was seen that APACHE II score had a higher specificity and positive predictive value as compared to serum CRP. However these differences were marginal, with an overall almost similar accuracy (CRP – 82 %; APACHE II – 80 %), but serum CRP scores over APACHE II in being less cumbersome, less complicated and highly cost effective. **Conclusion:** Since improved outcome in the severe form of AP is based on early identification of disease severity and subsequent focused management of these high-risk patients, we advocate the use of serum CRP as a routine test in patients of acute pancreatitis, to predict a severe attack of acute pancreatitis early in the course of disease and thus decrease overall mortality and burden of disease.

INTRODUCTION

Acute pancreatitis (AP) is a common digestive disease and the most frequent disorder of the pancreas. In the majority of cases, AP is a mild self-limiting disease with a mortality of less than 2%. However, about 20% of all cases develop severe disease, and despite considerable improvements in treatment, mortality remains between 15% and 25%, in severe cases and reaching up to 40% if pancreatic necrosis is infected.[1]

1) Clinical assessment

The clinician is, poor at predicting the severity of AP on admission, and fails to identify up to two-thirds of patients, who eventually develop complications or die. While accurate clinical assessment is of great importance for routine patient management, its main drawback is its unreliability in initial severity assessment.[2]

2) Atlanta severity classification

A clinically based classification system for AP was established in the International Symposium on Acute Pancreatitis in Atlanta, Georgia, in 1992. According to this classification, severe AP is associated with organ failure and/or local complications such as necrosis, abscesses, or pseudocysts. Criticism of the Atlanta severity classification system is growing, however, because it is retrospective, the duration of organ failure is unspecified, and because local complications do not seem to increase mortality.[3]

3) Ranson criteria

It takes into account age along with other physiological parameters to determine severity of pancreatitis. Presence of three or more criteria predicts severe acute pancreatitis.[4]

4) Acute Physiology and Chronic Health Evaluation II (APACHE II)

It is the most commonly used severity of illness scoring system in North America. Age, type of ICU admission (after elective surgery, non-surgical, after emergency surgery), a chronic health problem and 12 physiological variables are used to derive a score. Eight or more points, characterizes severe AP.

5) CT-based scoring systems

For the staging of AP, such as the Schröder and Balthazar scores, show prognostic value already within the first 24 hours after admission.

6) Biochemical markers

CRP, Cytokines, TAP, CAPAP etc[5]

Early prediction of severity is important as within the first 48 hours there is a therapeutic window when specific treatment alternatives may alter a patient's outcome. Beneficial results have been obtained with the early management of patients, correctly classified as severe, in intensive care units, with early ERCP in gallstone-induced disease, and prophylactic antibiotics. Conversely, reliable exclusion of patients with severe AP helps to avoid unnecessary use of invasive and otherwise costly procedures in mild cases, thereby facilitating optimal use of limited health care resources.[7,8,9,10]

Objective: The aim and objective of this study was to compare the levels of Serum CRP and APACHE-II Scoring system in determining the severity of acute pancreatitis.

The present study "Comparative Study of Serum CRP levels Vs APACHE-II Scoring system in determining the severity of acute pancreatitis." Was conducted for the period from Nov 2010 to Oct 2011 in the Acharya Shri Chander College of Medical Sciences and Hospital, Sidhra, Jammu. Patients admitted in the surgery and allied departments of this hospital were enrolled in the study after fulfilling the eligibility criteria including a written informed consent after explaining the study to the patient.

All patients of acute pancreatitis were included and at 48 hrs of admission, both serum CRP levels and APACHE II scores were recorded. Subsequently, the clinical course of the patients was noted in the hospital and on follow-up visits for a minimum period of 12 weeks.

The clinical course was labeled as mild or severe based on the definitions of the Atlanta symposium. Finally the sensitivity, specificity, positive predictive value and negative predictive value and accuracy of the APACHE II scoring system and the serum C-reactive protein levels, respectively, in picking up the patients, who develop severe acute pancreatitis was calculated and compared.

APACHE II SCORE

In all the patients diagnosed with acute pancreatitis, APACHE II score was calculated 48hrs after admission as, after 48 h, APACHE-II is most accurate, and correctly predicts outcome in 88% of attacks,and a score of more than 8 was considered significant to predict a severe attack.

ESTIMATION OF CRP

In patients diagnosed with acute pancreatitis, serum CRP was calculated at 48hrs of admission as 24 to 48 hr latency is necessary before detecting a CRP increase in plasma.

Statistical analysis

The statistical analysis of relevant data was done using SPSS. Proportional Chi square test and Chi square test was employed where relevant and the accuracy of C-reactive protein and APACHE II was compared using Mc Nemar test. In all statistical calculations a P value of < 0.05 was taken to be significant.

RESULTS

A total of 100 cases were studied

SERUM CRP LEVELS IN STUDY PATIENTS

The serum CRP levels in the patients under study are summarized as under. From this table the sensitivity, specificity, positive predictive value, negative predictive value and accuracy were evaluated.

CRP Level	Severe	Mild
<150 mg/dl	28	14
<150 mg/dl	4	54

Thus, from the above table,
Sensitivity: 87.5 %; Specificity: 79.4 %;
PPV: 66.66 %; NPV: 93.10 %;
Accuracy: 82 %
(PPV- positive predictive value; NPV- negative predictive value)

APACHE II SCORE IN STUDY PATIENTS

APACHE II	Severe	Mild
>8	21	9
<8	11	59

Thus, from the above table,
Sensitivity: 65.6 % Specificity: 86.7 %
PPV: 70 % NPV: 84.28 %
Accuracy: 80 %
(PPV- positive predictive value; NPV- negative predictive value)

COMPARISON OF CRP LEVELS WITH APACHE II IN DETERMINING THE SEVERITY OF ACUTE PANCREATITIS

The comparison of serum Crp with APACHE II scoring system as regards various criteria is tabulated as under:

Criterion	APACHE	CRP
Sensitivity	65.6%	87.5%
Specificity	86.7%	79.4%
PPV	70%	66.66%
NPV	84.28%	93.10%
Accuracy	**80.0%**	**82%**

P value – 0.036 (significant)

DISCUSSION

On evaluating CRP level > 150 mg/L, in our patients with acute pancreatitis we found out that, to determine severity it had a sensitivity, specificity, positive predictive value, negative predictive value and accuracy of 87.5%, 79.4%, 66.6%, 93.1%, 82% respectively.

• **Lempinen et al** noted that, C-Reactive protein had a sensitivity of 83%; specificity was 70%, whereas positive predictive values was 52%, and NPV 91% in detecting severe acute pancreatitis when measured at 48 hrs.
• **Raffaele Pezzilli** et al, noted that at a cut off of 128 to 129 mg/L for CRP, the sensitivity, the specificity and the efficiency to be 60.9%, 89.1%, and 77.6% respectively.

On evaluating APACHE II score > 8, in our patients with acute pancreatitis, we found out that, to determine severity it had a sensitivity, specificity, positive predictive value, negative predictive value and accuracy of 65.6%, 86.7%, 70%, 84.2%, and 80% respectively.

• **Wilson** et al. noted the following data when using APACHE II score > 8, to determine severity of acute pancreatitis. (sensitivity = 82%, specificity = 74%, positive predictive value = 50% and negative predictive value = 93%).
• **Fan** et al noted the following data as regards APACHE II score > 8, to determine severity of acute pancreatitis. (sensitivity = 64%, specificity = 59%, positive predictive value = 33% and negative predictive value = 84%)

On comparing serum CRP and APACHE II, it was seen that serum CRP had a higher sensitivity, negative predictive value and accuracy as compared to APACHE II. On the other hand APACHE II had a higher specificity and positive predictive value.

• **Gürleyik** et.al noted as regards the determination of severity of acute pancreatitis the sensitivity, specificity, positive predictive value, negative predictive value and accuracy of APACHE II (equal to, or greater than 7) to be : 62%, 86%, 57%, 88%, and 80% respectively and for CRP (equal to, or greater than 150 mg/L) to be : 85%, 74%, 50%, 94%, and 76% respectively.

SUMMARY AND CONCLUSION

On comparing serum CRP level > 150 mg/L with an APACHE II score of > 8, to predict a severe attack, it was seen that the former had a higher sensitivity, negative predictive value and overall accuracy compared to the latter. Again it was seen that APACHE II score had a higher specificity and positive predictive value as compared to serum CRP.

However these differences were marginal, with an overall almost similar accuracy (CRP – 82 %; APACHE II – 80 %), but serum CRP scores over APACHE II in being less cumbersome, less complicated and highly cost effective.

Since improved outcome in the severe form of AP is based on early identification of disease severity and subsequent focused management of these high-risk patients, we advocate the use of **serum CRP as a routine test** in patients of acute pancreatitis, to predict a severe attack of acute pancreatitis early in the course of disease and thus decrease overall mortality and burden of disease.

BIBLIOGRAPHY

1. **A C de Beaux,** "Factors influencing morbidity and mortality in Acute pancreatitis" **Gut 1995;** 37: 121-126.
2. **Abilio Munoz**. "diagnosis and management of acute pancreatitis", **American family physician**, **2000** July; 62: 164-174.
3. **Agarwal and Pitchumoni C. S.** "Simplified prognostic criteria in acute pancreatitis"**. Pancreas**, **1986;** 1(1): 69–73.
4. **Agarwal, N.**, Pitchumoni, C. S., and Sivaprasad,A. V. "Evaluating tests for acute pancreatitis", **Am J Gastroenterol**, **1990;** 85(4): 356–66.
5. **Åke Andrén Sandberg, "**Early Prediction of Severity in Acute Pancreatitis. Is This Possible?" **JOP. J of Pancreas (Online), 2002**; 3(5): 116-125.
6. **Antonio carnovale**. "Mortality in acute pancreatitis. Is it an early or late event" **JOP, 2005**; 6(5): 438-444.
7. **Austin L. Spitzer**, "Applying Ockham's Razor to Pancreatitis Prognostication, A Four-Variable Predictive Model", **Ann Surg, 2006;** 243(3).
8. **Balthazar EJ**. "Staging of acute pancreatitis". **Radiol Clin North Am, 2002**; 40: 1199-209.
9. **Balthazar, E. J**., Ranson, J. H., Naidich, D.P., "Acute pancreatitis: prognostic value of CT"**. Radiology**, **1985;** 156(3): 767–72.
10. **Banerjee A**, Kaul A, Bache E, Parberry A, Doran J, Nicholson M. An audit of fatal acute pancreatitis. **Postgrad Med J, 1995**; 71: 472-475.