



ROLE OF C-REACTIVE PROTEIN IN ACUTE PANCREATITIS: AN OBSERVATIONAL STUDY IN A TERTIARY CARE CENTRE

General Surgery

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KEYWORDS

INTRODUCTION

Acute pancreatitis (AP) is common, with an alarming rise in the global incidence. The clinical course of AP is highly variable, ranging from mild, self-limiting symptoms to multiple organ dysfunction and/or death. In the early stages, the treatment of AP is largely supportive and reactive. Delays in the identification of early organ dysfunction are associated with a higher risk of morbidity and mortality. Identifying patients with severe disease at earlier stages would facilitate appropriate intervention, goal directed treatment and reduce associated morbidity and mortality. Likewise, identifying patients with a milder course would allow for a more conservative management approach.

In addition to clinical scoring systems, numerous individual biomarkers have been proposed as having predictive value in AP: C-reactive protein (CRP), blood urea nitrogen (BUN), haematocrit and interleukins 6 and 8. CRP is one of the most commonly used biomarkers as it is routinely recorded, is relatively inexpensive and has been shown to correlate well with severity. Though CRP at time of admission has been shown to be a poor predictor of severity, levels of >150 mg/L within the first 48 h have a high sensitivity for predicting severe disease. Serum peak values between 48-72 hours and levels higher than 100-150 mg/dl is positive. Considering its peak at only 48-72 hours, so cannot be used to access severity in the therapeutic window of pancreatitis (first 72 hours) In this concentrate we have endeavored to check whether a solitary and early assessment of CRP levels is a viable indicator of morbidity and mortality in acute pancreatitis

AIMS AND OBJECTIVES

In this study we aimed to study the role of CRP as a prognostic indicator in acute pancreatitis.

METHODS

This was a prospective observational study done at SMIMER medical college, surat. Between the years of 2021 to 2022 fifty patients diagnosed to have acute pancreatitis were included in this study. Their CRP levels were sent on second day of admission and CT scan done after 72 hours of admission. Variables (age, sex), were recorded along with local (peri-pancreatic fluid collection, sterile necrosis, infected necrosis, pleural effusion) complication and systemic (cardiovascular, respiratory, renal failure, hematological) complication. This being an observational study, ethical clearance was not taken.

Sample size:

First consecutive fifty patients who came to our department with the diagnosis of acute pancreatitis after applying the exclusion criteria were selected for this study.

Inclusion criteria:

Patients with acute pancreatitis by Atlanta classification were included. Age greater than 20 and less than 50 were included

Exclusion criteria:

Patients with active inflammatory disease other than acute pancreatitis, liver failure/cirrhosis and patients with diseases like rheumatoid arthritis, diabetes mellitus, coronary artery disease, obesity etc., were excluded from the study.

Statistical method: All the data collected in proforma were entered in Microsoft excel sheet and SPSS software version 21 was used for

statistical calculations. Chi-square test with Fischers exact was used to calculate p value and find the significant association between CRP and different variables. Serial C reactive proteins levels were analyzed at 72 hours. Computed tomography with oral and IV contrast agents was done at 72 hours after admission and CT severity Index with CT grade and necrosis grade was ascertained.

RESULTS

Age distribution Most of the patients included in the study are young to middle aged males and most common age group was 30-40 years.

Relation of CRP levels with age distribution In our study of 50 patients we found that levels of CRP rises as age progresses as shown in Table 1

Table 1: Relation of CRP levels with age distribution.

Age group (years)	Average CRP levels
21-30	71.7
31-40	76.3
41-50	79.9

Relation of Ct-score with CRP levels at 72 hours In this study of 50 patients we found that as severity of pancreatitis increases on CT-scan correspondingly CRP levels also remains on higher side. With $p > 0.005$ which is clinically insignificant

Relation of local complications with CRP levels at 72 hours In our study of 50 patients we analyzed various local complications like necrosis, acute fluid collection and related that with CRP levels as shown in Table 2, $p = 1.07$

Table 2: Relation of local complications with CRP levels at 72 hours.

variables	CRP levels >100 at 72 hours	CRP levels <100 at 72 hours
Ct documented local complication	11	3
Ct documented no local complication	5	31

DISCUSSION

C-reactive protein (CRP) levels are well known to in response to injury, infection, and inflammation anywhere in the body. CRP (C-reactive protein) is mainly classified as an acute marker of inflammation (acute phase reactant), but main research is now starting to indicate its important roles that CRP plays in inflammation. CRP is the principal downstream mediator of the acute-phase response (APR) following an inflammatory event and is primarily manufactured by IL-6-dependent hepatic biosynthesis.

CRP research has been looked mostly on the role of CRP and its subtypes on cardiovascular disease and stroke. CRP is utilized as a bio clinical marker of inflammation anywhere in the body, with the rise of serum levels being a strong independent predictor/marker of cardiovascular disease in asymptomatic individuals. CRP levels have been linked and is related to prognosis in patients with atherosclerotic disease, congestive heart failure (CHF), atrial fibrillation (AF), myocarditis, aortic valve disease (AVD), and heart transplantation, reflecting that it has an active role in the pathophysiology of cardiovascular disease (CVD). Higher levels of CRP have been seen in patients with acute appendicitis, acute cholecystitis, acute

pancreatitis, and meningitis.⁶ In patients suffering possible symptoms of acute appendicitis, acute appendicitis can be ruled out in those with CRP (c reactive protein) levels lower than 25 mg/L, blood taken 12 hours after the onset of symptoms. When clinical symptoms of acute cholecystitis occur concurrently with CRP levels of above 30 mg/L, an accurate diagnosis of acute cholecystitis could be obtained with 78% sensitivity, reflecting that CRP is a more sensitive marker than erythrocyte sedimentation rate (ESR).⁷ In acute pancreatitis, CRP levels of above than 210 mg/L were able to differentiate between mild and severe cases, with 83% sensitivity and 85% specificity.⁸ Critical levels of CRP level is given as various in numerous studies be that as it may, CRP level >100 mg/dl as given in concentrate by research associates with values got in our concentrate as is taken as critical incentive for correlation.⁹ Distribution of etiology and gender in pancreatitis couldn't be contemplated as a large portion of the review bunch is comprised by young and middle ages

Normal CRP esteems in ensuing many years of life is viewed as expanding with normal qualities being 70.26 in third ten years and 77.72 in fifth decade, which additionally connects with literature where it is expressed that CRP esteems increment with age and raised qualities are seen in advanced age. Most of patients in our study with extreme disease had CRP values in excess of 100 mg/dl giving CRP at 72 hours a sensitivity and specificity of more than 80% and 85% respectively, which corresponds with prior investigations and builds up CRP level as a serious marker in intense pancreatitis with awareness and particularity better than the scoring frameworks as given by concentrate by many research articles.¹¹ In patients with necrotizing pancreatitis with necrosis score in CTSL, most patients among those had raised CRP levels >100 mg/dl giving CRP level sensitivity of 87.3% and specificity of 82.81% separately and by this data, it is set up that CRP level can be utilized as a pointer for necrosis and to settle on patients with intense pancreatitis who need a CECT at 48-72 hours, since the investigation (CECT) is costly and not generally accessible, CRP levels will prior give an insight about the undergoing inflammatory process. Similar findings were seen by Islam et al they found that values greater than 120 ng/l can detect between 67 and 100% of pancreatic necrosis.

Limitations This being a single center study suffers from type I statistical bias. Also, the sample size being small cannot be the representative of the whole population. There is a requirement of more large sample studies to be done in future to confirm the findings of this study.

CONCLUSION

Acute pancreatitis is a life-threatening disease with a wide spectrum of clinical symptoms. The job of diagnostic markers (pancreatic enzymes like amylase and lipase) as prognostic pointers has been a disappointment. However, CRP as a prognostic marker has shown promising results in earlier studies. CRP levels can give a prior insight about the undergoing inflammatory process. There is a need to further study its role so as to reduce the mortality and morbidity associated with acute pancreatitis.