ORIGINAL ARTICLE

Frequency of Raised Serum CRP in Acute Pancreatitis- A Cross-Sectional Study at Lahore General Hospital

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ABSTRACT

Aim: To determine the frequency of raised CRP levels amongst patients with acute pancreatitis.
Study Design: In this descriptive cross-sectional study.
Place and Duration: From January 2017 to December 2017, medical unit 01, Lahore General Hospital, Lahore.
Methods: 100 acute pancreatitis patients were enrolled. Patients of either gender aged between 15-70 years presenting with acute severe epigastric pain radiating to back and diagnosed as acute pancreatitis by serum amylase of 1000 units or more were included in the study. Those with history of any severe comorbid illness e.g., renal failure, chronic liver disease etc and any chronic inflammatory disorder were excluded from the study. Detailed clinical history was taken in each case to find out the cause of acute pancreatitis. Ranson Score and C reactive protein levels on admission were noted. A ranson score of 0-2 was considered mild; 3-5 as moderate and >6 as severe pancreatitis. A CRP level of >10mg/l was considered as raised. All the data was recorded on a pre-designed proforma and analyzed by SPSS version 21.0.p-value < 0.05 was taken as statistically significant
Results: Out of total 100 cases, raised CRP levels were observed in 92 (92%) patients. Mean CRP level was found to be 34.23±10.78mg/dL. All the patients with moderate and severe disease were found to have raised CRP levels. Upto 89.2% (66) of the mild cases also had raised CRP levels.
Conclusion: CRP levels offer a simple yet non invasive screening tool for detecting the presence of acute pancreatitis.
Keywords: Acute pancreatitis, C reactive protein, Ranson score, APACHE-II, CT Severity Index

INTRODUCTION

Acute pancreatitis is one of the routinely encountered surgical emergency. Most of the cases resolve spontaneously however it can progress to severe disease and have dire consequences leading to death. Iqbal et al[1] reported that upto 3.64% of patients died as result of acute pancreatitis. This rate is lower in western world due to better ICU facilities. Factors associated with increased mortality include age, length of stay, comorbidity burden, principal source of payment, and regional demographics.[2]

Acute pancreatitis can be classified into mild, moderate and severe disease with severe form of disease characterized by persistent organ failure and various local and systemic complications.[3,4] The mortality is particularly high in those with severe disease and ranges from 5 to 40%.[5] Various risk factors have been identified which are associated with greater severity of acute pancreatitis. BMI (≥25 kg/m2), APACHE-II (≥5) and blood glucose level on admission (>11.1 mmol/L) were recently shown to be associated with worsening of acute pancreatitis in patients admitted with mild acute pancreatitis.[6].

The pathophysiology involves an autodigestive inflammatory process which can ultimately lead to systemic inflammatory response syndrome and sepsis.[7, 8] Causes include gallstones, alcoholism, steroids, trauma e.g. post ERCP pancreatitis and autoimmune diseases.[9] The most common cause in our population is acute biliary pancreatitis secondary to gallstones. A recent study by Jamal et al[910] reported gallstones to be responsible for 36.45% of the cases. A study conducted amongst young patients still showed gallstones as the leading cause of acute pancreatitis responsible for approximately 69% of the cases.[11] Western data shows alcoholism to be the leading cause for acute pancreatitis.

In order to reduce the associated morbidity, it is important to be able to predict the severity of pancreatitis early on so as to take the necessary action. Severing scoring systems have been developed in this regard including Ranson score, CT severity index and APACHE II scoring etc.[12] Diagnostic indicators such as raised serum amylase and lipase have got poor prognostic value. Recently some acute phase reactants like C reactive protein (CRP) and procalcitonin have been evaluated for this purpose. Khanna et al[13] concluded that raised CRP levels are indicative of greater severity and pancreatic necrosis. A recent local study by Behan et al[14] reported raised CRP levels in up to 75% of patients with acute pancreatitis. Another study by Abbasi et al[15] noted CRP levels to be raised in 96.52% of the cases. Joshi et al[16] concluded that high CRP levels were a good prognostic marker and predictor of mortality in patients with acute pancreatitis. Habib et al[17] showed that levels of CRP > 150 mg/l are highly suggestive of necrosis in acute pancreatitis. Stirling et al[18] however reported that an interval rise of >90 mg/dL in CRP level from baseline or an absolute value of >190 mg/dL at 48 h predicted severe disease with the greatest accuracy.

Considering the huge burden of acute biliary pancreatitis in our country, it is important to have an easy to use and cost effective screening tool. CRP levels are easy to obtain as they only require a blood sample. We conducted this study with the aim of determining the frequency of raised CRP in patients with acute pancreatitis.

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MATERIAL AND METHODS

This descriptive cross-sectional study was conducted at medical unit 01 lahore general hospital lahore from janurary 2017 to December 2017. The sample size was calculated using Open Epi calculator with the statistical assumptions of 5% alpha error and 95 % confidence interval taking frequency of raised CRP to be 96.52%[9] amongst patients with acute pancreatitis and comes out to be at least 52 patients for this study. IRB ethical approval was taken. Patients of either gender aged between 15-70 years presenting with acute severe epigastric pain radiating to back and diagnosed as acute pancreatitis by serum amylase of 1000 units or more were included in the study. Those with history of any severe comorbid illness e.g renal failure, chronic liver disease etc and any chronic inflammatory disorder were excluded from the study. Non probability consecutive sampling was used to enroll the patients. Informed consent was taken in each case. Detailed clinical history was taken in each case to find out the cause of acute pancreatitis. Ranson Score and C reactive protein levels on admission were noted. A ranson score of 0-2 was considered mild; 3-5 as moderate and ≥6 as severe pancreatitis. A CRP level of >10 mg/L was considered as raised.

All the data was recorded on a pre-designed proforma and analyzed by SPSS version 21.0.Mean and standard deviation was calculated for all quantitative variables like age, CRP level etc. Frequency and percentage was calculated for all qualitative variables like cause of acute pancreatitis and gender etc. Stratification was done to allow for confounders such as degree of pancreatitis. Post Stratification Fisher exact test was applied to compare the frequency of raised CRP levels amongst the different grades of pancreatitis. P-value < 0.05 was taken as significant.

RESULTS

A total of 100 patients, both males and females were included in the study. Out of 100 patients, 41 were males and 59 were females (Figure 1).Mean age of patients was noted as 47.21±5.68 years with minimum and maximum age of 21 & 70 years respectively. All the patients were categorized as mild, moderate and severe on the basis of Ranson's criteria. 74(74%) patients had mild disease; 22(22%) had moderate and the rest 4(6%) were having severe disease (Table 1).

Table 1: Baseline characteristics

	Mild pancreatitis (n=74)	Moderate pancreatitis (n=22)	Severe Pancreatitis (n=4)
Male/ Female	30/44	11/11	0/4
Mean age ± SD	45.31±6.38	48.11±5.37	49.06±6.14
Raised CRP	66 (89.2%)	22 (100%)	4 (100%)

Raised CRP was found in 92% of the patients. Mean CRP level was found to be 34.23±10.78mg/dL. All the patients with moderate and severe disease were found to have raised CRP levels. Upto 89.2% (66) of the mild cases also had raised CRP levels. The most common cause for pancreatitis was gallstones accounting for 80% of the cases followed by alcoholism (8%), Traumatic (post ERCP) (5%) and cause being unknown in 7% of the cases.

Fig.1: Gender distribution

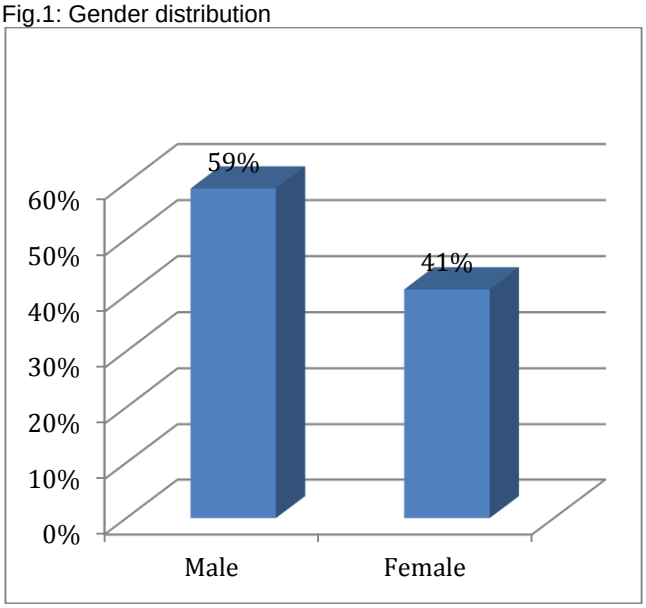
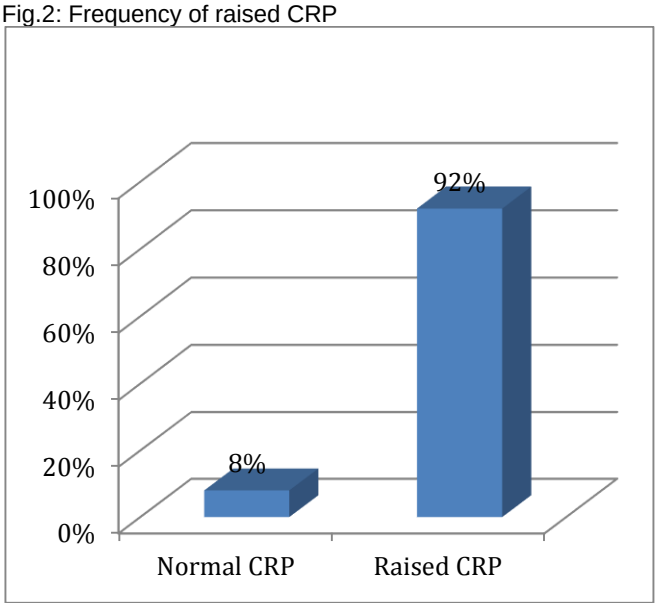


Fig.2: Frequency of raised CRP



DISCUSSION

Acute pancreatitis is a common surgical emergency that can progress to sepsis and even death if not managed promptly. Several scoring systems are available that allow to accurately predict the severity of disease. It is of utmost importance to be able to assess the severity early on as this is the single most important factor determining the course of action that will be taken in managing the patient.[19] However, there are are certain limitations to these scoring systems. CT severity index relies upon the use of CT scan which is not widely available in our setup. On the

other hand, Ranson score needs 48 hours to get a complete score.[20] Some studies have indicated a possible role of CRP in acute pancreatitis. Therefore, we decided to conduct this study with the principal objective of determining the frequency of raised CRP levels in patients with acute pancreatitis according to the severity.

Our study reported raised CRP levels in 92% of the cases. This was consistent with the findings of Abbasi et al[15] who found out CRP levels to be raised in 96.52% of the cases. On the contrary, Behan et al[14] found CRP levels to be raised in just 75% of the patients which was relatively lower as compared to our study. This can be attributed to the fact that they obtained CRP levels 72 hours after admission. Moreover they might have chosen a higher threshold for labelling CRP levels as "Raised". Another purpose of our study was to determine whether CRP levels are helpful in differentiating between mild, moderate and severe disease. Fischer Exact test was applied and we concluded that there was no significant difference in the frequency of raised CRP levels amongst mild, moderate and severe cases (p-value = 0.34).

Our study showed gallstones as the commonest cause of pancreatitis accounting for upto 80% of the cases. This was in line with the findings of Iqbal et al[1] who reported gallstones to be responsible for approximately 85% of the cases. Although gallstones was the commonest cause in the study conducted by Behan et al[14], it only accounted for 33.34% of the cases. We observed that majority of the patients had Mild pancreatitis (74%). Similarly, Abbasi et al[15] found out that 73% of the patients were having mild pancreatitis.

There were some limitations to our study. We did not perform subgroup analysis to compare the mean CRP levels amongst different grades of pancreatitis. We did not perform correlation regression analysis to correlate CRP levels with severity of acute pancreatitis. Ideally, CT severity index should have been used to grade the severity of pancreatitis. Future studies are warranted keeping the above mentioned limitations in mind.

CONCLUSION

CRP levels offer a simple yet non invasive screening tool for detecting the presence of acute pancreatitis.

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