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To Evaluation of C- Reactive Protein in Acute Pancreatitis by Semi Quantitative Method and Its Correlation with Prognosis: A Hospital Based Study

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ABSTRACT

Background: Acute pancreatitis is highly variable in clinical presentation and severity. Both anatomic and physiologic criteria are used to stage the severity of acute pancreatitis. The aim of this study to evaluated the C- reactive protein in acute pancreatitis by semi quantitative method and its correlation with prognosis.

Material & Methods: The present study was conducted on 50 patients attending medical outdoor, Government Hospital Barmer, Rajasthan, India. Our study includes patients of confirmed case of acute pancreatitis. Confirmation of acute pancreatitis is done according to atlanta symposium.

Results: The majority of cases (54%) were seen in 21-40 years of age group followed by 24% patients were seen in more than 55 years of age group and overall male to female ratio was 1.77:1. Mortality occurred mostly (6%) in more than 55 years of age group and serum C-reactive protein level >150mg/L, found to be significant ($P < 0.05$) to predict the severity of acute pancreatitis.

Conclusion: Thus we conclude that both , CRP and CT scan should be seen as an additional tool that aids clinical observation and physical examination, to predict complication and prognosis in acute pancreatitis and should not be used as alone parameter.

KEYWORDS: Pancreatitis, Serum C-Reactive Protein, Mortality, Recovered.

INTRODUCTION

Acute pancreatitis in inflammatory process of pancreas with variable involvement of other regional tissue or remote organ system.[1]

Nonbacterial inflammation of pancreas cause by activation, interstitial liberation and digestion of gland by its own enzymes, mild acute pancreatitis consist of minimal or no organ dysfunction and uneventful recovery, while severs pancreatitis manifest as organ failure and or local complications such as necrosis, abscess and pseudocyst.

Pancreatitis clinically present as abrupt onset moderate to severe, constant , boring pain in supper abdomen (pain may be absent 5-10 %), nausea and vomiting. Common complications of acute pancreatitis are infection within 2 weeks, pancreatitis, pancreatic abscess, while systemic complication are grouped under pulmonary, (pleural effusion, ARDS), cardiovascular (hypotension, pericardial effusion), gastrointestinal (peptic ulcer disease, erosive gastritis), renal (azotaemia, acute tubular necrosis) metabolic, fat necrosis and fat emboli.

Today C –reactive protein is the method of choice[2] and is valid after 48-72 hours of onset of pain. As C reactive protein, IL -6, ranson and APACHE II score are strong predictor of acute severe pancreatitis[3], but early prediction of acute pancreatitis by comparing CT scan, ranson apache II, and various serum markers none of these parameter tested, achieved sufficient predictability when used alone.[4]

The aim of this study to evaluated the C- reactive protein in acute pancreatitis by semi quantitative method and its correlation with prognosis.

MATERIALS & METHODS

The present study was conducted on 50 patients attending medical outdoor, Government Hospital Barmer, Rajasthan, India.

Inclusion Criteria

Patient with severe pain in upper abdomen and at least a 3 folds elevation of pancreatic amylase in blood. Our

study includes patients of confirmed case of acute pancreatitis. Confirmation of acute pancreatitis is done according to atlanta symposium 1992.[1] According to that:

- Mild acute pancreatitis consist of minimal or no organ dysfunction and uneventful recovery.
- Severe pancreatitis; manifest as multiple organ failure and or local complication such as necrosis , abscess and pseudocyst, other acceptable marker are >3 – ranson's criteria or > 8 APACHE II score with CECT scan can distinguish interstitial from necrotizing pancreatitis.

Exclusion Criteria

Non pancreatic disorder;

1. Chronic renal failure
2. Salivary gland lesion
3. Tumor induced hyperamylasemia
4. Macroamylasemia
5. Burn
6. Diabetic ketoacidosis
7. Pregnancy
8. Renal transplantation
9. Cerebral trauma
10. Morphine

Table No. 1: Age and sex distribution in acute pancreatitis

S. No.	Age Groups (Years)	Sex		Total
		Male	Female	
1	10 – 20	2 (40%)	3 (60%)	5 (10%)
2	21 – 40	20 (74.07%)	7 (25.92%)	27 (54%)
3	41 – 55	3 (50%)	3 (50%)	6 (12%)
4	> 55	7 (58.33%)	5 (41.66%)	12 (24%)
Total		32 (64%)	18 (36%)	50

Table 2: Correlation of age with prognosis

S. No.	Age Groups (years)	Recovered Completely	Recovered with complications	Death	Total
1	10 – 20	1 (20%)	4 (80%)	-	5 (10%)
2	21 – 40	12 (44.44%)	14 (51.85%)	1 (3.70%)	27 (54%)
3	41 – 55	3 (50%)	3 (50%)	-	6 (12%)
4	> 55	2 (16.66%)	7 (58.33%)	3 (25%)	12 (24%)
Total		18 (36%)	28 (56%)	4 (8%)	50

Table 3: Serum C-reactive protein at 48 hours of onset of pain

S. No.	Serum C-reactive Level	Male	Female	Total
1	< 6 mg/L	1 (50%)	1 (50%)	2 (4%)
2	6 – 150 mg/L	17 (77.27%)	5 (22.72%)	22 (44%)
3	> 150 mg/L	14 (53.84%)	12 (46.15%)	26 (52%)
Total		32	18	50
P value < 0.05 significant				

Table 4: Correlation of level of c-reactive protein with prognosis

S. No.	C-reactive protein level (mg/L)	Complete Recovery	Recovery with complications	Death	Total
1	0 – 6	1 (50%)	1 (50%)	-	2 (4%)
2	6 – 150	7 (31.82%)	13 (59.09%)	2 (9.09%)	22 (44%)
3	>150	10 (38.46%)	14 (53.84%)	2 (7.69%)	26 (52%)
	50	18	28	4	

RESULTS

The majority of cases (54%) were seen in 21-40 years of age group followed by 24% patients were seen in more than 55 years of age group and overall male to female ratio was 1.77:1 in our study (table 1).

Overall, mostly patients were recovered (92%) with or without complications only 8% mortality occurred in our study. Out of 46 patients, 18 patients completely recovered and 28 patients recovered with complications. Out of 28 patients, 14 patients in 21-40 years of age group followed by 7 patients in more than 55 years of age group. Mortality occurred mostly (75%) in more than 55 years of age group (table 2).

In our study showed that the 48 (96%) patients had elevated C-reactive protein level, out of 50, 22 patients (44%) had C-reactive protein level between 6 mg/L to 150 mg/L and 26 patients (52%) had C-reactive protein level >150mg/L, found to be significant ($P < 0.05$) to predict the severity of acute pancreatitis (table 3). Mortality were occurred in patients had elevated C-reactive protein level (table 4).

DISCUSSION

In this study the common age of presentation of acute pancreatitis was 21-40 years for both male and female i.e. in 27 patients (54%) and male were predominant in this age group (74.07%). Common age group for female was 40-60 years. It was common in females between 50-60 years because cholelithiasis is common in female age > 40 years. In male it was common between 20-40 years because of alcohol consumption.

In our study showed that the 48 (96%) patients had elevated C-reactive protein level, out of 50, 22 patients (44%) had C-reactive protein level between 6 mg/L to 150 mg/L and 26 patients (52%) had C-reactive protein level >150mg/L, found to be significant ($P < 0.05$) to predict the severity of acute pancreatitis. Mortality were occurred in patients had elevated C-reactive protein level. A CRP level of less than or equal to 200mg/dl obtained at 72 hours is useful enough to rule out with high degree of probability the presence of necrosis in acute pancreatitis. With higher values more investigations need to be done to predict necrosis. A marked variation was seen in CRP levels of two groups of extensive pancreatic necrosis and minimal pancreatic necrosis indicating that in individual cases CRP alone is not a good indicator of necrosis.[5] Robert JH (2003)[4] found that with the univariate analysis, the four most reliable marker were pancreatic amylase, neutrophil elastase, albumin, and C-reactive protein and none of these parameters tested achieved sufficient predictability when used alone. In this study serum C-reactive protein level >150mg/L, found to be significant ($P < 0.05$) to predict the severity of acute pancreatitis. Gurleyik G. (2004)3 found that Ranson score 4 or above, APACHE II score 8 or above, baseline 1L-6, and C-reactive protein level 150 mg/L respectively were regarded as strong predictors of acute pancreatitis. C-reactive protein level at 24, 48, 72 hour ($p = 0.02$) were significantly high. The sensitivity was 83.3% and specificity was 71% and accuracy was 73.3%. Raffaele Pezzilli (1999)[6] found that C-reactive protein greater than 100mg/L indicate severe acute pancreatitis in 60-80% of patients. This also correlates with our study; however its sensitivity is good only after the first 48 hours from the onset of pain. According to Ake Andren Sandberg[2], C-reactive protein is the method of choice although this marker is not valid until 48-72 hours of after the onset of pain.

The very fact that more research continues for a better predictor indicates that serum CRP may not be the most accurate indicator. Until a more accurate indicator comes along, CRP is readily available. It will prove to be even more cost effective if single estimations will prove predictive. Therefore only single estimation of CRP is being used in this study. Even if a better marker comes along CRP will still be the reference parameter by which the other will be judged. CT-scan abdomen with IV contrast is now the gold standard for radiological diagnosis of acute pancreatitis as demonstrated by Balthazar and colleagues.[7] It has been proved to predict severity of acute pancreatitis and pancreatic necrosis.

So taking into consideration the fact, that severity of pancreatitis has to be decided not on radiological or biochemical parameters, but also on clinical parameters like presence of complications and time to recovery. Here, CRP of 63mg/dl were found to be associated with a longer time to recovery but not associated with presence of complications.

CONCLUSION

Thus we conclude that both, CRP and CT scan should be seen as an additional tool that aids clinical observation and physical examination, to predict complication and prognosis in acute pancreatitis and should not be used as alone parameter.

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