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Original Research Article

Can CRP levels predict the Severity of Acute Pancreatitis?

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Abstract

Acute pancreatitis is an inflammatory condition with varying degrees of severity, and predicting its severity is crucial for optimal management. This retrospective study aimed to investigate the relationship between C-reactive protein (CRP) levels at admission and the modified Computed Tomography Severity Index (CTSI) after 48 hours in patients with acute pancreatitis. The study included 18 patients (16 females and 14 males) admitted to a tertiary care hospital over a 6-month period. The mean CRP levels showed an increasing trend with higher CTSI scores, rising from 18.5 (SD 24.749) at a CTSI of 2 to 154.5 (SD 150.614) at a CTSI of 8. However, this result was not statistically significant ($p = 0.254$), possibly due to the small sample size and large standard deviation. Younger age was found to correlate with greater severity, with a mean age of 24 (SD 2.828) years at a CTSI of 8 ($p = 0.031$). The white blood cell count also demonstrated an increasing trend with higher CTSI scores, although not statistically significant ($p = 0.713$). Serum amylase levels showed an inconsistent increase with CTSI. The study's limitations include its retrospective nature, small sample size, and the absence of samples with a CTSI of 10. In conclusion, while CRP levels at admission showed an upward trend with increasing severity of acute pancreatitis, the results were not statistically significant in predicting severity.

Keywords: Acute Pancreatitis, CTSI, CRP levels.

Introduction

Acute pancreatitis is an inflammatory condition characterised by activation of pancreatic enzymes leading to various degrees of inflammation classified by Revised Atlanta Classification System. [1]

Mortality varies and is related to the severity of Acute Pancreatitis; it's about 1% across all Acute pancreatitis patients but may be as high as 20 -30 % in severe Pancreatitis when it involves the multiple organs and leading to their dysfunction. [2]

The incidence of acute pancreatitis in Kashmir ranges from 5.6% to 10.3% with most common cause as Gallstones followed by ascariasis then alcohol and idiopathic with 47.7%, 6.9%, 1.2% and 33.7% respectively. [3]

The high mortality i.e, 30-40% associated with complicated pancreatitis (Moderately Severe and Severe Acute Pancreatitis) puts an interest in the studying of predictors of severity of Acute Pancreatitis and one of them is C-reactive protein (CRP) levels. Though there are multiple scoring systems viz, Ranson Score, APACHE II, BISAP, Glasgow Score, etc but all are cumbersome to be calculated. [4] CRP is a biochemical test and is available at most centers. The CRP levels at 48 hrs or the change in levels has been used for the severity of Acute Pancreatitis [1] in past but that needs at least 24-48 hrs also.

In this study we studied the relation of CRP levels at admission and modified CTSI (Computed Tomography Severity Index) after 48 hrs of Acute Pancreatitis in our tertiary care hospital. This study aims to predict earlier the severity of Acute Pancreatitis so that it helps in better optimization and management of acute pancreatitis.

Material and Methods

This is a retrospective study conducted over a period of 6 months. The data was retrieved from our ward files and we included all patients who were admitted with us as case of Acute Pancreatitis excluding those whose data was not properly entered. A total of 36 patients were admitted with us as case of acute pancreatitis in whom 8 patients were excluded because the CRP levels were not

quantified but were given in a qualitative value. The data was entered in Microsoft spreadsheets and analyzed using SPSS V 20.

Results

In our study, a total of 30 patients were included, comprising 16 females and 14 males, resulting in a male-to-female ratio of 8:7. Twelve patients were excluded from the study due to the absence of quantitative CRP data, yielding a final sample size of 18 patients. The mean CRP levels exhibited an upward trend, increasing from 18.5 (SD 24.749) at a CTSI of 2 to 154.5 (SD 150.614) at a CTSI of 8. Although this suggests a rise in CRP levels with increasing severity, the result was not statistically significant (p = 0.254), potentially due to the small sample size and large standard deviation. The mean age at a higher CTSI of 8 was 24 SD 2.828 yrs, indicating that younger age correlates with greater severity, a finding that was statistically significant (p = 0.031). Serum amylase levels demonstrated an inconsistent increase with CTSI, whereas the WBC count showed a rising trend from 7.5 (SD 0.707) at a CTSI of 2 to 14.5 (SD 2.828) at a CTSI of 8 but was statistically insignificant (p Value 0.713), as shown in Table 1.

Table 1: Descriptive Data

CTSI		Sr Amylase	Age (yrs)	WBC	CRP
2	Mean	2282	44.5	7.5	18.5
	N	2	2	2	2
	Std. Deviation	309.713	17.678	0.707	24.749
4	Mean	1694.71	52.29	12	47.29
	N	7	7	7	7
	Std. Deviation	1225.839	15.392	9.129	42.692
6	Mean	1853.43	60.71	13	50.71
	N	7	7	7	7
	Std. Deviation	864.777	12.051	3.83	77.89
8	Mean	1773	24	14.5	154.5
	N	2	2	2	2
	Std. Deviation	2159.504	2.828	3.536	150.614
p Value		0.935	0.031	0.713	0.254

Discussion

The CRP levels at 48 hrs or the change in levels has been used for the severity of Acute Pancreatitis [1] in past but that needs at least 24-48 hrs also. In this study we studied the relation of CRP levels at admission and modified CTSI (Computed Tomography Severity Index) after 48 hrs of Acute Pancreatitis in our tertiary care hospital. In our stusy the mean CRP levels exhibited an upward trend, increasing from 18.5 (SD 24.749) at a CTSI of 2 to 154.5 (SD 150.614) at a CTSI of 8.

Although this suggests a rise in CRP levels with increasing severity, the result was not statistically significant (p = 0.254), potentially due to the small sample size and large standard deviation. This can also be explained by the fact that it takes 36-50 hr for hepatic synthesis of CRP levels after an insult. [5] so it can be said that CRP levels though showing an upward trend at admission level but no significance statistically in predicting the severity of acute pancreatitis as shown by other studies also; Rami et al [1], Fisic et al [6] and Ke et al [7].

Upto the CTSI of 6 we had and an increasing age with each severity index increasing from 44.5 SD 17.678 yrs at CTSI of 2 to 60.71 SD 12.051 yrs at CTSI of 6. this was also shown by other study of Knoepfli et al [8] The mean age at a higher CTSI of 8 was 24 (SD 2.828), indicating that younger age correlates with greater severity, a finding that was statistically significant (p = 0.031). This variation in age may be due to small sample size.

The WBC count showed a rising trend from 7.5 (SD 0.707) at a CTSI of 2 to 14.5 (SD 2.828) at a CTSI of 8 but was statistically insignificant (p Value 0.713). The increasing levels of TLC with increasing CTSI was also shown by other studies like of Noman et al [9] which showed A linear relationship between the hematological indices and CT severity score.

Serum amylase levels demonstrated an inconsistent increase with CTSI as shown in table 1 which was consistent with the study by Nordestgaard et al [10] who showed no correlation between the initial serum amylase level and the extent of pancreatic involvement visualized by CT.

Limitations of our study were first this was a retrospective study, second we had a small sample size and third we could not get any sample from CTSI of 10 in our study.

Conclusion

This retrospective study aimed to investigate the relationship between C-reactive protein (CRP) levels at admission and the severity of acute pancreatitis, as determined by the modified Computed Tomography Severity Index (CTSI)

after 48 hours. The study concluded that CRP levels at admission did not significantly predict the severity of acute pancreatitis, which is consistent with findings from other studies.

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