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Original Research Article

Clinical profile and outcomes of patients with acute pancreatitis and correlation with severity index from a tertiary care centre in South India-retrospective analysis

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ABSTRACT

Background: Acute pancreatitis is an inflammatory condition of the pancreas having a varied clinical presentation. It is one of the commonest causes of abdominal pain requiring hospital admission. This retrospective study aims to describe the clinical profile and outcomes of patients with acute pancreatitis and its correlation with severity index.
Methods: All patients admitted with a diagnosis of acute pancreatitis to medical gastroenterology department between January 2018 to December 2020 were included in this retrospective study.
Results: A total of 61 subjects were included in the final analysis. The mean age was 41.64, the ranged between 19 to 88 years. Among the study population, 53 (86.89%) were male and 8 (13.11%) were female. Among the people 43 (70.49%) were alcoholics, 22 (36.07%) were smokers, 11(18.03%) had systemic hypertension and 5 (8.20%) participants had type 2 diabetic mellitus. The mean CTSI was 2.15±2.82, the mean Balthazar was 3.43±2.4 and the mean procalcitonin was 2.52±9.28. The mean Lipase was 7822. There was a weak positive correlation between CTSI and CRP (r_s value: 0.147, p=0.260). There was a weak negative correlation between Balthazar and CRP (r_s value:-0.067, p=0.606).
Conclusions: Among the study population, 87% of the patients were males. 70% of the population were alcoholics. Mean serum lipase was 7822. There was a weak positive correlation between CTSI and CRP (r_s value: 0.147, p=0.260). There was a weak negative correlation between Balthazar and CRP (r_s value:-0.067, p=0.606).

Keywords: Acute pancreatitis, CTSI, Balthazar

INTRODUCTION

Acute pancreatitis is an acute inflammatory process involving the pancreas. According to Atlanta classification, Patients who have 2 of following 3 criteria are defined to have acute pancreatitis-1) Presence of the typical abdominal pain, 2) Elevated amylase and lipase greater than 3 times the normal limit, and 3) Radiological imaging consistent with pancreatitis, using CT or MRI.[1]

Acute pancreatitis is further classified into 2 broad categories depending on the presence of necrosis.

Interstitial pancreatitis is characterized by inflammation of the pancreas with no evidence of pancreatic or peri pancreatic necrosis.

Necrotizing pancreatitis is characterized by inflammation of the pancreas with evidence of pancreatic and or peri pancreatic necrosis.[1]

Acute pancreatitis is also further classified into mild, moderately severe, and severe acute pancreatitis. Mild acute pancreatitis is classified when there are no organ failure and no local or systemic complications. Moderately

severe acute pancreatitis is classified as transient organ failure (<48 hours) and or local and systemic complications without persistent organ failure. Severe acute pancreatitis is classified as persistent organ failure (>48 hours) single or multiple organ failure.[2]

Prevalence rate for pancreatitis in India is 7.9 per 100,000. Prevalence rate for men and women 8.6 and 8.0 per 100,000 respectively in India.[3]

The aetiology of acute pancreatitis is multi factorial such as alcohol induced, gall stone induced, hyper triglyceride induced, genetic mutations like PRSS1 (serine protease 1) gene, SPINK1 (serine protease inhibitor kazal type 1) gene and CFTR (cystic fibrosis transmembrane conductance regulator) gene.

METHODS

This retrospective study was conducted in medical gastroenterology department of Chettinad super speciality hospital. All patients diagnosed to have acute pancreatitis between January 2018 to December 2020 were included in this study.

A total of 61 patients who had fulfilled the diagnosis of acute pancreatitis according to Atlanta classification were included in the study. Institutional ethics and research were obtained. Normal lipase value in our hospital was 293 IU/L. So, patients with a lipase value of above 876 IU/L which is three times the upper limit of normal were considered to have acute pancreatitis.

The data extracted from the patients included name, hospital no, age, sex, systemic hypertension status and type 2 diabetes mellitus status. Values of triglyceride, ldl, total cholesterol, complete blood count, liver function test, amylase, lipase, CRP, procalcitonin, renal function tests like urea and creatinine. sodium, potassium, bicarbonate, calcium and CTSI, Balthazar scores were also noted.

Statistical analysis was performed using SPSS 24 version for mac. Descriptive stats were done including calculated means and standard deviations for continuous variables and Pearson correlations for CRP with 4 variables (ldl, CTSI, Lipase, Balthazar).

RESULTS

A total of 61 subjects were included in the final analysis. The mean age was 41.64, the ranged between 19 to 88 years (Table 1).

Among the study population, 53 (86.89%) were male and 8 (13.11%) were female (Table 2).

Among the patients, 43 (70.49%) were alcoholics, 22 (36.07%) were smokers, 11 (18.03%) had systemic hypertension and 5 (8.20%) patients had type 2 diabetic mellitus (Table 3 and Figure 1).

Table 1: Descriptive analysis of age in study population, (n=61).

Parameters	Mean±SD	Minimum	Maximum
Age (years)	41.64±15.98	17.00	87.00

Table 2: Descriptive analysis of gender in the study population, (n=61).

Gender	Frequency	Percentage (%)
Male	53	86.89
Female	8	13.11

Table 3: Descriptive analysis of risk factor in the study population, (n=61).

Risk factors	Frequency	Percentage (%)
Alcohol	43	70.49
Smoking	22	36.07
SHT	11	18.03
Type 2 diabetic mellitus	5	8.20

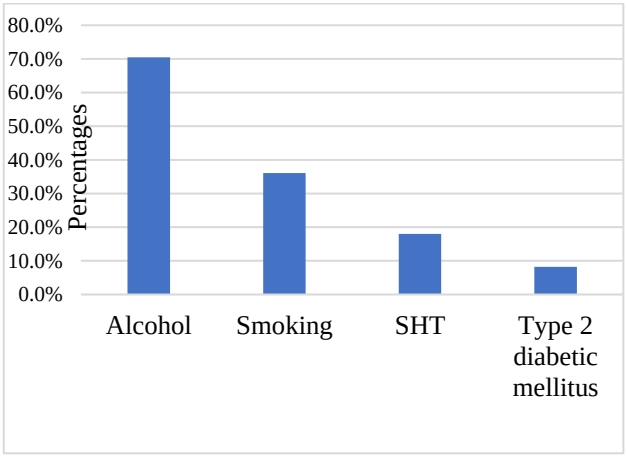

Figure 1: Risk factor in the study population, (n=61).

The complete blood cell count of mean hemoglobin (g/dl) was 14.5±3.01, the mean packed cell volume (%) was 49.67±46.88, the mean total cell count (/µL) was 12080.33±3508.65, the mean neutrophil (%) was 80.74±10.05, the mean lymphocyte (%) was 13.73±10.66, the mean platelet was 2.53±0.98 and the mean corpuscular volume(fl) was 86.57±12.25 (Table 4).

The mean total bilirubin (m/dl) was 2.54±3.55, the mean direct bilirubin (mg/dl) was 1.34±2.84, the mean serum glutamic oxaloacetic transaminase (IU/L) was 77.52±95.75, the mean serum glutamic pyruvic transaminase (IU/L) was 80.8±0.75, the mean alkaline phosphatase(U/L) was 131.46±119.4, the mean gamma-glutamyl transpeptidase was 196.7±254.95, the mean albumin (g/dl) was 6.38±20, the mean total protein (g/dl) was 6.99±0.81 (Table 4).

The lipid profile of mean triglycerides, LDL cholesterol and total cholesterol was 134.98±75.88 (mg/dl), 98.15±55.51 (mg/dl) and 161.16±64.33 (mg/dl) respectively (Table 4).

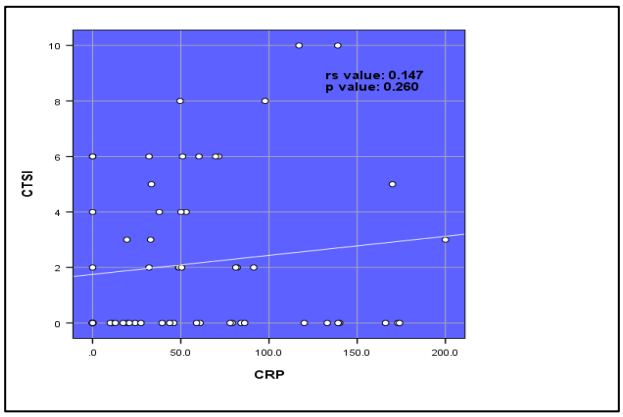

Figure 3: Scatter plot of diagram of correlation between CRP between CTSI in the study population, (n=61).

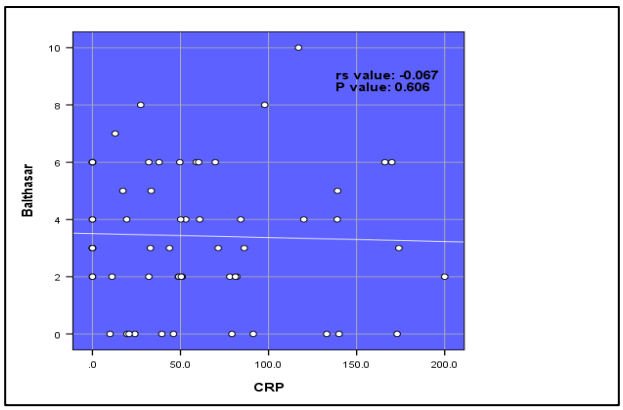

Figure 4: Scatter plot of diagram of correlation between CRP between CTSI in the study population, (n=61).

The renal function parameter of mean creatinine (mg/dl) was 1.11±0.85 and the mean urea (mg/dl) was 13.52±8.79. The mean amylase was 881.98±1584.43 in the study population. The mean lipase was 7822.56±16105.16 in the study population. The mean CRP was 57.94±53.16 in the study population. The mean international normalized ratio was 1±0.2 in the study population. The mean bicarb was 21.51±1.82 The mean potassium was 4.2±0.53 in the study population. The mean calcium was 9.91±9.53 in the study population. The mean sodium was 135.9±4.99 in the study population (Table 4).

The mean CTSI was 2.15±2.82, the mean Balthazar was 3.43±2.4 and the mean procalcitonin was 2.52±9.28 (Table 5). Out of 61 participants, 29 (47.57%) participants received ulinastatin (Table 6). There was a weak positive correlation between CTSI and CRP (r_s value:0.147, p=0.260) (Figure 3).

There was a weak negative correlation between Balthazar and CRP (r_s value: -0.067, p=0.606) (Figure 4).

Table 4: Descriptive analysis of complete blood cell count in study population, (n=61).

Variables	Mean±SD	Min	Max
Complete blood cell count			
Hemoglobin	14.5±3.01	7.10	23.10
Packed cell volume (%)	49.67±46.88	24	403.00
Total cell count (/µL)	12080.3±3508.6	4100	22200
Neutrophil (%)	80.74±10.0	51.30	97.60
Lymphocyte (%)	13.73±10.66	2.20	64.00
Platelet	2.53±0.98	0.43	5.38
Mean corpuscular volume (fl)	86.57±12.25	41.10	111.20
Liver function test			
Total bilirubin (mg/dl)	2.54±3.55	0.25	19.82
Direct bilirubin (mg/dl)	1.34±2.84	0.05	16.28
Serum glutamic oxaloacetic transaminase (SGOT) (IU/L)	77.52±95.75	0.61	548.00
Serum glutamic pyruvic transaminase (SGPT) (IU/L)	80.8±80.75	17	504.00
Alkaline phosphatase (U/L)	131.46±119.4	38.00	690.00
Gamma-glutamyl transpeptidase	196.7±254.95	14.00	1473.00
Albumin (g/dl)	6.38±20	2.00	160.00
Total protein (g/dl)	6.99±0.81	3.80	8.10
Lipid profile			
Triglycerides (mg/dl)	134.98±75.88	43.00	401.00
LDL cholesterol (mg/dl)	98.15±55.51	8.00	425.00
Total cholesterol (mg/dl)	161.16±64.33	43.00	499.00
Renal profile			
Creatinine (mg/dl)	1.11±0.85	0.47	6.79
Urea (mg/dl)	13.52±8.79	2.00	45.00
Amylase	881.98±1584.43	64.00	8950.00
Lipase	7822.56±16105.16	105	106850
CRP	57.94±53.1	0.00	200.00
International normalized ratio	1±0.2	0.50	1.57
Bicarbonate	21.51±1.82	17.00	26.00
Potassium	4.2±0.53	3.20	5.60
Calcium	9.91±9.53	7.50	83.00
Sodium	135.9±4.99	118	147.00

Table 5: Descriptive analysis of CTSI, Balthazar and procalcitonin in study population, (n=61).

Parameters	Mean±SD	Minimum	Maximum
CTSI	2.15±2.82	0.00	10.00
Balthazar	3.43±2.4	0.00	10.00
Procalcitonin	2.52±9.28	0.00	70.73

Table 6: Descriptive analysis of ulinastatin in the study population, (n=61).

Ulinastatin	Frequency	Percentages (%)
Yes	29	47.54
No	32	52.46

DISCUSSION

Acute pancreatitis is an inflammatory condition of the pancreas resulting in the abdominal pain and raised serum lipase levels.

The abdominal pain is usually acute in onset, severe in intensity over the epigastrium.[4] The pain typically radiates to the back which usually lasting between a few hours to days.[5] Patients also present with associated with vomiting and nausea which may last for hours.[6]

A total of 61 consecutive patients admitted under the department of medical gastroenterology were included in this study. 87% of the patients with acute pancreatitis were males. This finding is similar to the other studies which have shown male predominance.[7]

Alcohol is known to be one of the major risk factors for causing acute pancreatitis. 70% of our patients had alcoholic abuse as one of the major risk factors. Alcohol is thought to cause pancreatitis by increasing the synthesis of enzymes by pancreatic acinar cells to increase the synthesis of lysosomal and digestive enzymes.[8] 34% of patients had smoking as one of the risk factors for pancreatitis. The association between smoking and pancreatitis is well established.[9]

The mean hematocrit was 49.67. Hemo-concentration occurs due to loss of intravascular fluid to the third spaces. The mean lipase in our study was 7822. Serum lipase has a sensitivity of 88-100% in diagnosing acute pancreatitis.[10] Serum lipase is known to be elevated within 4 hours of onset of symptoms and will peak at 24 hours and returns to normal within 8-14 days.[11]

The mean triglyceride in our study was 134.98±75.88 (mg/dl). 10 (6%) patients had pleural effusion, out of which 1 patient had massive left sided effusion secondary to a pancreatico-pleural fistula which resolved post stenting.

Procalcitonin was done in 16 (9.7%) patients, of which 7 (4.27%) were found to be negative. Mean CRP was 58. At 48 hours, a CRP of 150 mg/L has a sensitivity and specificity of 87 and 86% in predicting severe acute pancreatitis.[12]

The mean CTSI was 2.15±2.82, the mean Balthazar was 3.43±2.4. CTSI score was calculated in 30 patients only. Among the patients with CTSI score, there was a weak positive correlation between CTSI and CRP (r_s value:0.147, p=0.260).

There was a weak negative correlation between Balthazar and CRP (r_s value:-0.067, p=0.606).

Limitations

This retrospective study was conducted in a single department. This study also suffers from the limitations of a retrospective study such as absence of data. Procalcitonin was checked in only 16 patients. CTSI score could be calculated in 30 patients only. The etiology of acute pancreatitis could not be identified in all patients due to lack of data.

CONCLUSION

Among the study population, 87% of the patients were males. 70% of the population were alcoholics. Mean serum lipase was 7822. The mean CTSI was 2.15±2.82, the mean Balthazar was 3.43±2.4 and the mean procalcitonin was 2.52±9.28. There was a weak positive correlation between CTSI and CRP (r_s value:0.147, p=0.260). There was a weak negative correlation between Balthazar and CRP (r_s value:-0.067, p=0.606).

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