International Surgery Journal
Pahuja V et al. Int Surg J. 2025 Mar;12(3):339-343
http://www.ijsurgery.com
pISSN 2349-3305 | eISSN 2349-2902

DOI: https://dx.doi.org/10.18203/2349-2902.isj20250565

Original Research Article

A prospective cohort study of clinical presentation and outcomes of acute pancreatitis at tertiary care center

Vivek Pahuja[1], Nisha Rani[2], Girish Singla[3], Pankaj Dugg[4], Sarabjit Singh[5]*

[1]Department of Surgery, Dr B R Ambedkar State Institute of Medical Sciences, SAS Nagar, Punjab, India
[2]Civil Hospital, SAS Nagar, Punjab, India
[3]Department of General Surgery, Adesh Medical College and Hospital, Vill Mohri, Shahbad, Haryana, India
[4]Department of Surgery, Government Medical College, Amritsar, Punjab, India
[5]Department of General Surgery, Punjab Institute of Medical Sciences, Jalandhar, Punjab, India

Received: 15 December 2024
Revised: 17 January 2025
Accepted: 24 January 2025

***Correspondence:**
Dr. Sarabjit Singh,
E-mail: sarabmedico@gmail.com

ABSTRACT

Background: Acute pancreatitis present with varied symptoms and etiologies and had variety of outcomes based on severity. The study was conducted to see the clinical presentation and outcomes of acute pancreatitis at tertiary care center.
Methods: The study was carried out on 47 patients of acute pancreatitis. The clinical presentations and outcomes were noted. The severity is assessed by modified computed tomography severity index (MCTSI). Statistical analysis was done on Microsoft Excel version 21. P value<0.05 is considered significant.
Results: The mean age of patients was 36.94±10.63 years with male to female ratio of 2.6:1. Alcohol was the common etiological factor seen in 59.57% (n=28). MCTSI score was significant in detecting necrosis (p=0.00001) and predicting mortality (p value=0.000048).
Conclusions: Severe acute pancreatitis has high mortality. MCTSI is good prognostic factor for assessing morbidity and mortality.

Keywords: Acute pancreatitis, Multi organ failure, Mortality, Pancreas, Pancreatic necrosis

INTRODUCTION

Acute Pancreatitis is a common condition presenting as acute abdomen. This condition is broadly classified into two subtypes: one, edematous or mild acute pancreatitis and two, a necrotizing or severe acute pancreatitis.[1] Acute pancreatitis is a reversible pancreatic parenchymal injury associated with inflammation.[1] There are many causes of acute pancreatitis, gallstones being the most common one followed by alcohol abuse. Other causes include ERCP induced, iatrogenic, hypercalcemic states (Hyperparathyroidism), hyperlipidemia, familial pancreatitis, trauma, drug induced pancreatitis (i.e. steroids, thiazide diuretics and azathioprine etc), viral infections (mumps, coxsackievirus, cytomegalovirus) and rare causes like Sjogren's syndrome.[2]There are many clinical and imaging-based scoring systems developed over the time. These include Ranson's criteria, Glasgow scales, simplified acute physiology (SAP) score and acute physiology and chronic health evaluation II (APACHE II) score, BISAP score, modified computed tomography severity index (MCTSI) criteria etc.[3] Pancreatitis can present as epigastric or diffuse abdominal pain (80–95%), nausea and vomiting (40–80%), abdominal distension, fever, breathlessness, irritability and impaired consciousness, with pyrexia, low oxygen saturation, tachypnoea, tachycardia, hypotension, abdominal guarding, ileus and/or oliguria.[4] Treatment is mainly supportive and starts with intravenous fluid resuscitation, analgesia, antibiotics and enteral nutrition, may require

intensive care and organ support. Supplementation in form of parenteral nutrition can be given. In certain cases, pancreatic exocrine and endocrine replacement therapy is also advised. If abscess or necrosis develops timely surgical intervention in form of necrosectomy and/or drainage is also required.[5] The study was conducted to see the clinical presentation and outcome of the patients of acute pancreatitis in tertiary care center.

METHODS

The prospective cohort study was carried out at tertiary care center after taking permission from institutional ethics committee. 47 patients with clinical diagnosis of acute pancreatitis presenting in the Department of Surgery, Government Medical College, Patiala from Nov 2016 to Nov 2019 were included in the study after taking informed consent.

Inclusion criteria

Patients of all ages and both sexes were included. Indoor patients with typical clinical symptoms of acute pancreatitis. Patients giving consent for this study.

Exclusion criteria

Chronic pancreatitis, carcinoma of pancreas, outdoor cases, refusal of consent. Routine laborartory investigations were done including hemogram, liver function test, renal function test, serum calcium levels, serum amylase, serum electrolytes, arterial blood gas, ultrasonography abdomen, chest X ray, contrast enhanced computed tomography (CECT) of whole abdomen.

The CECT scan examination was conducted on Siemens Somatom Emotion, six slice, third generation spiral CT machine. MCTSI (Mortele et al, 2004) was calculated for severity which includes.

0 points for normal pancreas, 2 points for intrinsic pancreatic abnormalities with or without inflammatory changes in peripancreatic fat, 4 points for pancreatic or peripancreatic fluid collection or peripancreatic fat necrosis plus 2 points for less than 30% necrosis, 4 points for more than 30% necrosis, 2 points for any extra pancreatic complications (one or more of pleural effusion, ascites, vascular complications, parenchymal complications or gastrointestinal tract involvement).

The CT findings of acute pancreatitis were graded according to modified CT severity index and categorized as mild (0-2 points), moderate (4-6 points) or severe (8-10 points) pancreatitis.[6]

Statistical analysis

Statistical analysis was done on MS office excel sheet 2021. P value is calculated using Man Whitney U test and Chi square test. P value<0.05 is considered significant.

RESULTS

The mean age of patients was 36.94±10.63 years with maximum age of 75 years and youngest was of 11 years. The male to female ratio was 2.6:1. The difference was not significant statistically (p>0.05) (Table 1).

Pain and vomiting are the commonest complaint among the patients seen in 26% (n=41) and 27% (n=42) patients. Fever and dyspepsia were other common complaints (Figure 1). Majority of patients had history of alcohol abuse (59.57%) followed by biliary colic (25.5%). Others were idiopathic and trauma (Figure 2). The assessment of the patients was done using MCTSI score and accordingly assessed the severity of pancreatitis. Majority of patients had moderate pancreatitis (n=21). While mild and severe pancreatitis is seen in equal number of patients (n=13). The mean score was 4.37 (Figure 3).

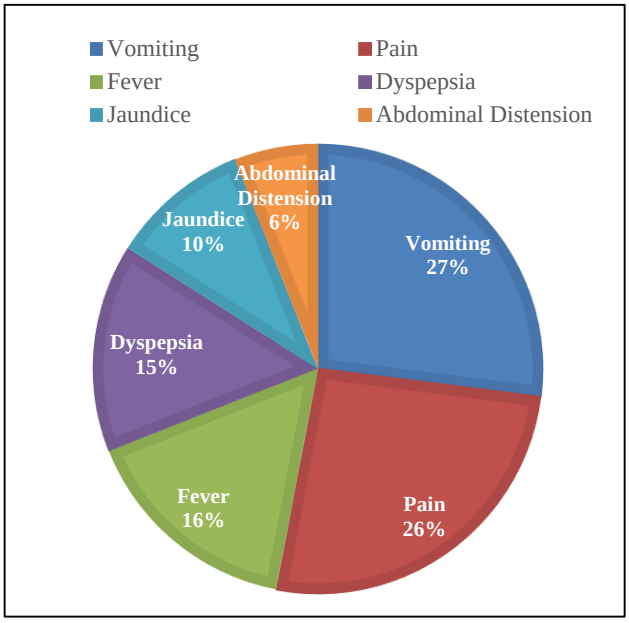

Figure 1: Presenting Complaints.

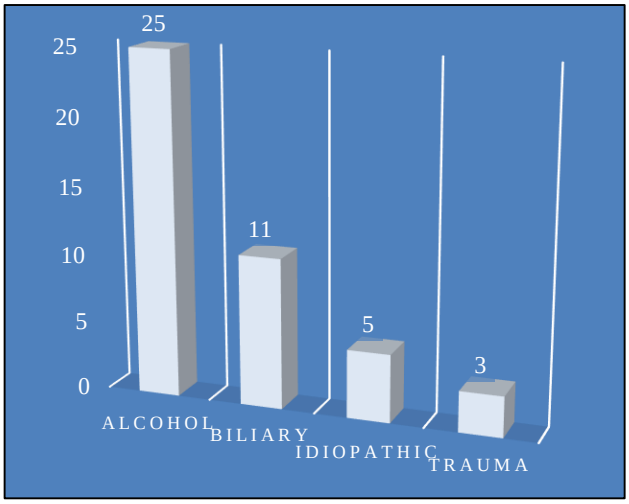

Figure 2: Etiology of pancreatitis.

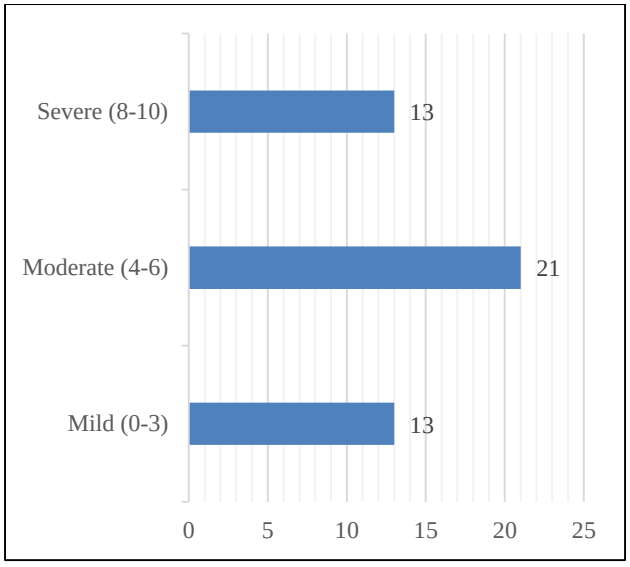

Figure 3: MCTSI Score.

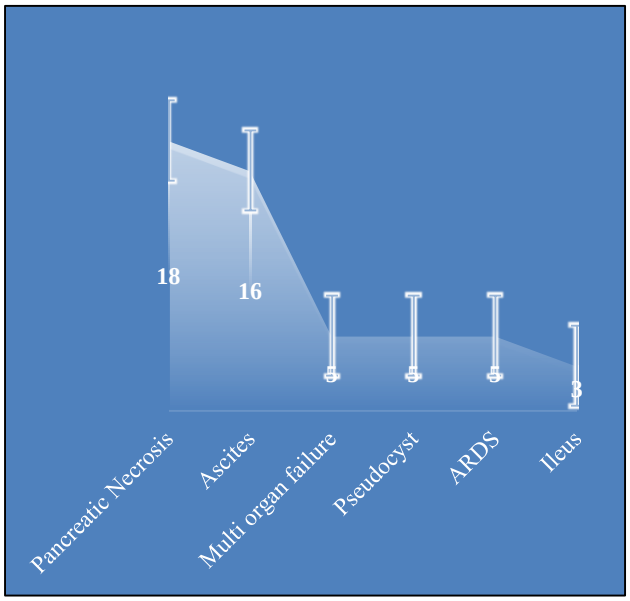

Figure 4: Complications.

Eighteen patients had necrosis as detected by MCTSI score. Five patients had necrosis of>30% while five patients of moderate pancreatitis and eight patients of severe pancreatitis had necrosis of<30%. The detection of necrosis and its degree of necrosis is significantly higher with higher scores (p value=0.00001 and 0.0132 respectively) (Table 2).

40% patients showed complications (n=19). 18 patients had local complications in form of necrosis and pseudocyst formation while 16 patients had systemic complications in form of multiorgan failure (MODS), acute respiratory distress syndrome (ARDS), ileus and ascites (Figure 4). Mortality is seen in five patients (10.63%). All patients had severe pancreatitis with mean score of 8.40. The outcome is highly significant (p<0.05) (Table 3).

Table 1: Demographic profile.

Age (in years)	Male	Female	Total
11-25	4	1	5
26-40	8	5	13
41-55	14	5	19
56-70	7	1	8
>70	1	1	2
Total	34	13	47
Mean±SD	37.88±16.21	48.04±8.83	36.94±10.63
P value	0.13622		

Table 2: Correlation of necrosis with MCTSI score.

Necrosis	MCTSI score			Mean score	P value
	0-2	4-6	8-10		
<30%	0	5	8	7.16	.0132
>30%	0	0	5	8.40	
Mean±SD	7.44±1.33				
P value	0.00001				

Table 3: Mortality correlation with MCTSI score.

Mortality	MCTSI score			Mean score	P value
	0-2	4-6	8-10		
Absent	10	19	13	5.28	0.000048
Present	0	0	5	8.40	

DISCUSSION

Acute pancreatitis has recently seen increased incidence among children, pregnancy and the elderly and became a common indication for hospital admission. With increasing severity and complications like fluid and/or necrotic collections causes substantial morbidity severe disease with persistent organ failure causes significant mortality.[5] The present study was conducted to see the presentation and outcomes of the patients of acute pancreatitis at tertiary care center.

Majority of the patients were of middle age group with mean age of 36.94±10.63 years. Male patients were higher in number than females, although the findings were not significant. This is in comparison to study by Balthazar et al., in which there were 75% male patients but average age is slightly higher that is 45 years.[7] In another study on acute pancreatitis done by Khanna et al, 2013, mean age of presentation was 40.5 years which was comparable to present study.[8] Kim et al, also showed male predominance in their study (70%). This can be explained by prevalence of alcohol abuse among males.[9]

Pain (n=41) and vomiting (n=42) are the two major complaints with which patient presented to the hospital. Fever and dyspepsia are the other major complaints with most of them associated with pain. Jaundice is seen in 10% of patients only. Abdominal pain is the commonest

presenting complaints and is one the diagnostic criteria for acute pancreatitis.[10] Philip et al, 2013, considered pain as cardinal symptoms that determine course of disease as well as prognosis of AP.[11] Fever occurs due to infections and pancreatic fluid collections. Jaundice has been seen in biliary obstruction in biliary pancreatitis.[12] Nausea and vomiting is observed in 40-80% cases of acute pancreatitis as per previous study.[5] Similar findings were observed in current study.

In present study alcohol abuse was the most common causative factor for acute pancreatitis with 53.33%, followed by biliary calculi (30%). Idiopathic etiology was seen in 10% patients. The findings are in accordance with the study conducted by Simmons et al, 1997, which reported 72% incidence of pancreatitis due to alcohol abuse.[13] However, Bohidar et al, and Kim et al, found gallstones as main causative factor.[9,14] Alcohol and gall stones are the commonest etiology, while hypertriglyceridemia and drugs are notable among many causes.[5,10,15] The difference in etiology may be attributed to geographical distribution and the prevalence of alcohol consumption in the population studied.

Modified Computed Tomography Severity Index (MCTSI) is used in diagnosing severity of pancreatitis. It was found that patients with high MCTSI score have significantly higher chances of necrosis ($p<0.05$). Miko et al, in their study of various parameters to predict severity of pancreatitis observed that all tools performed equally.16 Khanna et al, and Nagar et al, observed high CTSI score was associated with high chances of necrosis.[8,17] As per the study of Kumar et al, MCTSI has high predicting value for acute pancreatitis, pancreatic necrosis and ICU admissions.[18] However Alberti et al, 2021, found CTSI better than MCTSI in predicting pancreatic infections.[19] As we have used single parameter so comparison was not done in present study.

The complications observed in current study was predominantly pancreatic necrosis and ascites. Multi organ failure is seen in five patients. Timely identification and treatment of these complications are of utmost important to prevent readmissions and mortality.[5] The severe acute pancreatitis has biphasic course, a pro-inflammatory response in 1-2 weeks results in systemic inflammatory response syndrome (SIRS) which can lead to early multisystem organ failure (MOF).

After the first 1-2 week, a transition from a pro-inflammatory response to an anti-inflammatory response occurs; during this transition, the patient is at risk for intestinal flora translocation and the development of secondary infection of the necrotic tissue, which can result in sepsis and late MOF.[20] Leung et al, found that the higher CTSI associated with higher complication rate and the CTSI≥5 is an index.[21] MCTSI is a good prognostic indicator in predicting the incidence of complications in acute pancreatitis.

The mortality is seen in five patients (10.63%) who had significantly high MCTSI score. Balthazar et al, 1990, reported that mild pancreatitis exhibited 3% mortality and 8% morbidity. Patients with CTSI of 4-6 had 6% mortality and 35% morbidity while CTSI of 7-10 exhibited 17% mortality and 92% complication rate.[22] Mir et al, also observed similar findings in a prospective study on 350 patients of acute pancreatitis where Group C patients with severe pancreatitis had the highest complication rate (91.6%) and highest mortality rate (16.67%).[23] Despite the reduction in overall mortality in the last decade, SAP is still associated with high mortality.[20] Based on etiology of pancreatitis higher incidence of deaths is seen in idiopathic and other group of pancreatitis rather than alcohol and biliary pancreatitis.[15]

The study has certain limitations with respect to sample size and short duration of study. Further studies and reviews can be done to obtain the more desirable results and outcomes.

CONCLUSION

In conclusion, Acute pancreatitis is in severe form carries high mortality rate. CT scan is the best investigation to assess the motility and morbidity of pancreatitis as well as complications of pancreatitis.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Maitra A. The Pancreas. In: Kumar V, Abbas AK, Aster JC, eds. Robbins & Cotran Pathologic Basis of Disease 10th ed. Philadelphia, PA: Elsevier;2021:p.881-894
2. Conwell DL, Banks PA, Greenberger NJ, Braunwald E, Hauser SL, Jameson JL. Acute Pancreatitis Pathogenesis and Diagnosis. In: Jameson J, Fauci AS, Kasper DL, Hauser SL, Longo DL, Loscalzo J. Jameson J, Fauci AS, Kasper DL, Hauser SL, Longo DL, Loscalzo J, Jameson JL, eds. Harrison's Principles of Internal Medicine. 20th edn. McGraw Hill;2018: Accessed Aug 25,2023. https://accesspharmacy.mhmedical.com/content.aspx?bookid=2129&sectionid=252299183
3. Cho JH, Kim TN, Chung HH, Kim KH. Comparison of scoring systems in predicting the severity of acute pancreatitis. World Journal of Gastroenterology 2015;21(8):2387-94.
4. Kiriyama S, Gabata T, Takada T, Hirata K, Yoshida M, Mayumi T, et al. New diagnostic criteria of acute pancreatitis. Journal of Hepato-Biliary-Pancreatic Sciences 2010;17(1):24–36.
5. Szatmary P, Grammatikopoulos T, Cai W, Huang W, Mukherjee R, Halloran C, et al. Acute

Pancreatitis: Diagnosis and Treatment. Drugs 2022;82(12):1251-76.
6. Mortele KJ, Wiesner W, Intriere L, Shankar S, Zou KH, Kalantri BN, et al. A modified CT severity index for evaluating acute pancreatitis: improved correlation with patient outcome. AJR American J of Roentgenol. 2004;183(5):1261-5.
7. Balthazar EJ, Ranson JH, Naidich DP, Megibow AJ, Caccavale R, Cooper MM. Acute pancreatitis: prognostic value of CT. Radiol. 1985;156(3):767-72.
8. Khanna AK, Meher S, Prakash S, Tiwary SK, Singh U, Srivastava A. Comparison of Ranson, Glasgow, MOSS, SIRS, BISAP, APACHE-II, CTSI scores, il-6, crp and procalcitonin in predicting severity, organ failure, pancreatic necrosis and mortality in acute pancreatitis. Hepatobiliary and Pancreas Surg. 2013:3;67581.
9. Kim YS, Lee BS, Kim SH, Seong JK, Jeong HY, Lee HY. Is there correlation between pancreatic enzyme and radiological severity in acute pancreatitis? World J of Gastroenterol. 2008;14(15):2401-5.
10. Waller A, Long B, Koyfman A, Gottlieb M. Acute pancreatitis: updates for emergency clinicians. The J Emerg Med. 2018;55(6):769-79.
11. Phillip V, Schuster T, Hagemes F, Lorenz S, Matheis U, Preinfalk S, et al. Time period from onset of pain to hospital admission and patients' awareness in acute pancreatitis. Pancreas. 2013;42(4):647-54.
12. Umapathy C, Gajendran M, Mann R, Boregowda U, Theethira T, Elhanafi S, et al. Pancreatic fluid collections: Clinical manifestations, diagnostic evaluation and management. Disease-a-month. 2020;66(11):100986.
13. Simmons MZ, Miller JA, Zurlo JV, Levine CD. Pleural effusions associated with acute pancreatitis: Incidence and appearance based on computed tomography. Emergency Radiol. 1997;4:287–9.
14. Bohidar NP, Garg PK, Khanna S, Tandon RK. Incidence, etiology and impact of Fever in patients with acute pancreatitis. Pancreatol. 2003;3(1):9-13.
15. Yasuda H, Horibe M, Sanui M, Sasaki M, Suzuki N, Sawano H, et al. Etiology and mortality in severe acute pancreatitis: A multicenter study in Japan. Pancreatol. 2020;20(3):307-17.
16. Mikó A, Vigh É, Mátrai P, Soós A, Garami A, Balaskó M, et al. Computed tomography severity index vs. other indices in the prediction of severity and mortality in acute pancreatitis: a predictive accuracy meta-analysis. Frontiers in Physiol. 2019;10:1002.
17. Nagar AB, Gorelick FS. Epidemiology and pathophysiology of acute pancreatitis. in: forsmark CE eds. pancreatitis and its complications. Clinical Gastroenterol. Humana Press;2005.
18. Kumar AK, Singh GM. A comparison of APACHE II, BISAP, Ranson's score and modified CTSI in predicting the severity of acute pancreatitis based on the 2012 revised Atlanta Classification. Gastroenterol Report (Oxf). 2018;6(2):127-31.
19. Alberti P, Pando E, Mata R, Vidal L, Roson N, Mast R, et al. Evaluation of the modified computed tomography severity index (MCTSI) and computed tomography severity index (CTSI) in predicting severity and clinical outcomes in acute pancreatitis. J of Digestive Dis. 2021;22(1):41-8.
20. Zerem E. Treatment of severe acute pancreatitis and its complications. World J of Gastroenterol. 2014;20(38):13879-92.
21. Leung TK, Lee CM, Lin SY, Chen HC, Wang HJ, Shen LK, et al. Balthazar computed tomography severity index is superior to Ranson criteria and APACHE II scoring system in predicting acute pancreatitis outcome. World J of Gastroenterol. 2005;11(38):6049-52.
22. Balthazar EJ, Robinson DL, Megibow AJ, Ranson JH. Acute pancreatitis: value of CT in establishing prognosis. Radiol. 1990;174(2):331-6.
23. Mir MA, Bali BS, Mir RA, Wani H. Assessment of the severity of acute pancreatitis by contrast-enhanced computerized tomography in 350 patients. Ulus Travma Acil Cerrahi Derg. 2013;19(2):103-8.

Cite this article as: Pahuja V, Rani N, Singla G, Dugg P, Singh S. A prospective cohort study of clinical presentation and outcomes of acute pancreatitis at tertiary care center. Int Surg J 2025;12:339-43.