

Original Research Article

# Clinical profile and outcome of acute pancreatitis and necrotizing pancreatitis


Shaishav Patel<sup>1</sup>, Tejas Patel<sup>1</sup>, Dhiren Hada<sup>1</sup>, Mukesh Suvera<sup>2</sup>,  
Hiren Parmar<sup>3\*</sup>

<sup>1</sup>Resident doctor, Department of Surgery, Smt N.H.L. Municipal Medical College, Ahmedabad, India

<sup>2</sup>Associate Professor, Department of Surgery, Smt N.H.L. Municipal Medical College, Ahmedabad, India

<sup>3</sup>Associate Professor, Department of Surgery, GMERS Medical College, Gandhinagar, India

\*Corresponding author email: [drhirenparmar@gmail.com](mailto:drhirenparmar@gmail.com)

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## Abstract

**Background:** Acute pancreatitis includes a wide spectrum of disease, from mild self limiting symptoms to a fulminant process with multiple organ failure and high mortality. Around 20% of the patients of acute pancreatitis develop acute severe pancreatitis in the form of extensive pancreatic or peripancreatic fat tissue necrosis with associated peripancreatic collections. These patients run a protracted clinical course with high morbidity and mortality.

**Material and methods:** Clinically, radiologically and by blood investigated, diagnosed 40 patients of acute pancreatitis were prospectively evaluated for the clinical outcome with respect to presence or absence of pancreatic necrosis and severity in terms of CTSI.

**Results:** 24 patients had acute pancreatitis without necrosis (Group A) whereas 16 patients had necrosis including >30% of gland (Group B). The rate of organ dysfunction and mortality (0% versus 25%) rate of was significantly higher in the group B. Multi organ failure (MOF) was present in 4.17% of group A and 20.84% of group B patients. 80% patients were managed conservatively, who all survived and 20% patients underwent surgical intervention of whom 50% survived.

**Conclusion:** CECT is the modality of choice to diagnose acute pancreatitis, presence or absence of necrosis, to stage the severity of pancreatic necrosis, depict severity of inflammatory processes and local complications. Patients with pancreatic necrosis with transient end organ dysfunction can be treated conservatively with favorable outcome. The need for intervention should be individualized and based on the clinical condition of patient.

## Key words

Acute pancreatitis, Necrotizing pancreatitis, Conservative, Intervention, Treatment.

## **Introduction**

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Acute pancreatitis is defined as an acute condition presenting with abdominal pain and is usually associated with raised pancreatic enzymes level in the blood as a result of pancreatic inflammation [1]. Acute pancreatitis may be categorized as mild or severe. Mild acute pancreatitis is characterized by interstitial edema of the gland and minimal organ dysfunction. 80% of patients will have mild attack of pancreatitis, having mortality around 1% [1]. Severe acute pancreatitis is characterized by pancreatic necrosis, a severe systemic inflammatory response and often multi organ failure [1]. In those who have a severe attack of pancreatitis the mortality varies from 20-50%. About one third of deaths occur in the early phase of the attack, from multiple organ failure, while deaths occurring after the first week of onset are due to septic complication [1]. According to Atlanta symposium [2], severe pancreatitis is defined by pancreatitis associated with organ failure and/or local complication such as necrosis, abscess or pseudocyst. The natural course of severe acute pancreatitis progresses in two phases. The first two weeks are characterized by the systemic inflammatory response syndrome (SIRS) resulting from the release of inflammatory mediators. In patients with necrotizing pancreatitis, organ failure is common and often occurs in the absence of infection. In addition to organ dysfunction, general derangements include hypovolemia, a hyper dynamic circulatory regulation, fluid loss from the intravascular space and increased capillary permeability. The second phase begins approximately two weeks after the onset of the disease. It is dominated by sepsis related complication resulting from infection of pancreatic necrosis. This is associated with multiple systemic complications such as pulmonary, renal and cardiovascular failure [3, 4]. Clinical scoring system for pancreatitis utilizes multiple clinical variables to predict outcomes in groups of patients with acute pancreatitis; e.g. Ranson score, and APACHE 2 (Acute physiology and chronic health evaluation)

score which includes 12 physiological variables [5]. On CECT, necrotizing pancreatitis is defined by focal or diffuse well marginated zone of unenhanced parenchyma (>3 cm in diameter or >30% of pancreatic area) after intravenous contrast administration [5]. Balthazar EJ, et al. [6] constructed a Computed tomography severity index (CTSI) for acute pancreatitis that combines the grade of pancreatitis with the extent of pancreatic necrosis. The CTSI assigns points to patients according to their grade of acute pancreatitis as well as the degree of pancreatic necrosis. More points are given for a higher grade of pancreatitis and for more extensive necrosis. The patients with higher CTSI have higher mortality and complication rates [7]. This prospective study was conducted on patients with acute pancreatitis and acute necrotizing pancreatitis. Their clinical profile and outcome was noted with respect to the extent of pancreatic necrosis and severity in terms of CTSI and the results statistically analyzed.

## **Material and methods**

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The study was conducted on 40 patients of age > 20 and < 70 years in the Department of Surgery, hospital affiliated with Smt N.H.L. MMC, Ahmedabad from march 2013 to march 2015 to see the clinical profile and outcome of acute pancreatitis and acute necrotizing pancreatitis. The diagnosis of necrotizing pancreatitis was made on CECT with more than 30% necrosis in pancreas (after 72 hours of onset of disease) and with at least, either pain abdomen or raised serum amylase and lipase. The patients already operated outside for necrotizing pancreatitis or for any other intra-abdominal condition at the time of presentation were not included in the study. The patients were divided into Group A which included patients with acute pancreatitis without necrosis and Group B which included patients with necrotizing pancreatitis diagnosed on CECT. Organ failure was defined as PaO<sub>2</sub> < 60 mm Hg despite receiving 4 L oxygen /minute via nasal tube or need for mechanical ventilation; serum creatinine level > 2 mg/dl; systolic blood pressure (BP) < 90 mm Hg or need for

catecholamine support. Multiple organ failure was defined as failure of 2 or more organ systems.<sup>[8]</sup> The data obtained was analyzed using chi square method to know the outcome of acute pancreatitis and necrotizing pancreatitis with respect to CT Severity Index [7].

## Results

The youngest patient in our study was of 22 years and the oldest of 67 years (mean age: 44.7 years). 24 (60%) patients were male and 16 (40%) were female, the male to female ratio being 3:2. 16 (40%) patients were alcohol addict. 24 (60%) patients had documented gall stone induced pancreatitis. No obvious cause of pancreatitis was found in 4 (10%) patients. All the patients had a significant increase (> 100 mg/dl) in the serum amylase and lipase levels. 12 patients (30%) in our study had 7 or >7 points on CTSI and 28 (70%) had <7 points on CTSI. 24 (60%) patients did not have pancreatic necrosis (Group A) and 16(40%) patients had more than >30% necrosis (Group B) diagnosed on CECT.

The analysis concerning single organ failure and MOF in these two groups was given in the **Table - 1**. The rate of mortality and the rate of organ dysfunction were significantly higher in the group B.

Infection in pancreatic tissue (pigtail and operative tissue) was present in 8 patients. Escherichia coli grew in 6, acinetobacter in 4, and pseudomonas in 4 patients. Out of these 8 patients, 2 underwent pigtail insertion and recovered. Remaining 6 required either necrosectomy or pigtail + necrosectomy and out of these 4 (66%) patients died. The mean hospital stay of the patients was 13.20 days (range: 4 – 35 days). Maximum number 24 (60%) of patients had a hospital stay in range of 5-15 days. Minimum stay was 4 days of a patient who expired due to multiple organ failure. The patient with maximum hospital stay (35 days) underwent pig tail insertion followed by surgery and was discharged in a stable condition. (**Table – 2**)

**Table – 1:** Comparison of variables in both groups.

Variable	Group A		Group B		Total	%	P value
	No	%	No	%			
<b>Organ dysfunction</b>							
Cardiovascular							
Yes	2	8.33	4	25	6	15	<0.05
No	22	91.66	12	75	34	85	
Renal							
Yes	4	16.67	10	62.5	14	35	<0.05
No	20	83.33	6	37.5	26	65	
Respiratory							
Yes	2	8.33	8	50	10	25	<0.05
No	22	91.66	8	50	30	75	
MOF							
Yes	1	4.17	5	20.84	15	15	<0.05
No	23	95.83	11	79.16	85	85	
Mortality							
Yes	0	0	4	25	10	10	<0.05
No	24	100	12	75	90	90	

**Table – 2:** Treatment and average hospital stay in days in both groups.

Treatment	Group A		Group B	
	No of patients	Average hospital stay in days	No of Patients	Average hospital stay in days
Conservative	24	8	8	12
Pig tail insertion	0	-	2	20
Necrosectomy / pigtail insertion + necrosectomy	0	-	6	25

## Discussion

In our study the youngest patient was of 22 years, the oldest was of 67 years and the mean age was 44.7 years. Male to female ratio was 3:2. Besselink MGH, et al. [8] found median age of presentation as 53 years (range: 18–86 years) and 55% were males. 16 (40%) patients were alcohol addict. 24 (60%) patients had documented gall stone induced pancreatitis. In 4 (10%) patients no obvious cause of pancreatitis was found. Sivasankar A [9] found alcohol consumption in 11 (45.8 %), biliary microlithiasis in 2 (8.3%), blunt abdominal trauma in 1 (4.1%) and unknown cause of acute pancreatitis in 4 (16.6%) patients. All the 40 patients had a significant increase in their serum amylase and lipase levels. It has been stated that the specificity of serum lipase and amylase can be improved by raising the threshold to at least three times the upper limit of the normal reference values [10]. We did not find any significant difference in the comparison of the CTSI score > 7 in patients with acute severe pancreatitis. Similar observation has been made by Mortelet KJ [7] who stated that CTSI is a powerful tool to predict outcome when comparing patients with mild and severe pancreatitis; however no significant correlation was obtained when comparing patients with moderate and severe pancreatitis. Balthazar EJ [6] stated that patients who had a severity index of 0-3 exhibited a 0 % mortality rate and 8% morbidity, while patients with severity index of 4-6 had 6% mortality and a 35% morbidity rate. While a severity index of 7 – 10 yielded a 17% mortality rate and a 92% complication rate. In our study 15% patients

were in shock and required inotropic support, 25% had respiratory failure, 35% had renal failure and 6% had multi organ failure at admission, 25% mortality in necrotizing pancreatitis. Beger [2] found that patients with extended sterile necrosis of the pancreas are at high risk for infected necrosis with the consequence of progressive multiorgan dysfunction syndrome. The mean hospital stay of the patients in our study was 13.2 days. Besselink MGH [8] concluded that conservative management is associated with decrease mortality but increased hospital stay. In our study, 80% patients were managed conservatively and 20 % underwent surgical intervention (pigtail, necrosectomy or both). Santvoort [4] did conservative management in 62% and surgical intervention in 38% patients and concluded that primary catheter drainage improves outcome in patients with infected pancreatic necrosis. Many authors [4, 8] concluded that postponing necrosectomy is associated with decrease mortality but increased hospital stay. Alsfasser G [11] opined that a highly conservative approach in necrotizing pancreatitis results in significantly lower mortality and open surgery should be reserved for concomitant intra abdominal complications. Buchler MW [3] concluded that in patients with severe infected necrosis, surgical treatment is preferable.

## Conclusion

Contrast enhanced computed tomography scan (CECT) is the modality of choice to help stage the severity of pancreatic necrosis, depict

severity of inflammatory processes and local complications. The rate of mortality was significantly higher in patients with higher degree of necrosis. Patients with pancreatic necrosis with transient end organ dysfunction can be treated conservatively with favorable outcome. The need for intervention should be individualized and based on the clinical condition of patient.

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