

**A STUDY ON CLINICOETIOLOGY AND OUTCOME IN A PATIENT WITH ACUTE PANCREATITIS**VALLURU SIVARAMAKRISHNA<sup>1\*</sup>, PURUSHOTHAM<sup>1</sup>, YAMALA ANAND BABU<sup>2</sup>, PADALA ADITYA<sup>2</sup><sup>1</sup>Department of General Surgery, Sri Venkateswara Medical College, Tirupati, Andhra Pradesh, India. <sup>2</sup>Department of General Surgery, Sri Venkateswara Medical College, Tirupati, Andhra Pradesh, India.

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**ABSTRACT**

**Objectives:** Acute pancreatitis (AP) is a common problem in medical practice. Mild AP recovers spontaneously within 1 week. Whereas high-grade AP patients suffer with severe complications such as necrosis and finally landing organ failure. The prognosis in these cases is very poor. This study was conducted to examine the clinical features, causative factors, and consequences of AP.

**Methods:** This study was conducted in the Department of general surgery, S.V.R.R.G.G.H, Sri Venkateswara Medical College, Tirupati, after taking Institutional Ethical Committee from March 2021 to March 2023. 100 cases are taken for study.

**Results:** Age group of patients included in this study was 18–70 years. The mean age of presentation is noted in this study was 38–86 years. Alcohol consumption is the most common causative factor identified in this study which is about 62%. Most of the cases presented with pain abdomen (90%) followed by vomiting (77%). Other clinical manifestations are abdominal distention (24%) and Jaundice (10%).

**Conclusion:** Alcohol is the most common etiology being identified of about 62% of cases followed by gallstones 30%. The most common presenting complaints were abdominal pain and vomiting. The combination of serum amylase and serum lipase provided high sensitivity (95%) for the diagnosis of AP. Computed tomography was a non-invasive method of diagnosing and imaging complications.

**Keywords:** Severe acute pancreatitis, Pancreatic necrosis, Systemic inflammatory response syndrome.

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**INTRODUCTION**

Acute pancreatitis (AP) is a common problem in medical practice. Mild AP recovers spontaneously within 1 week. Whereas patients with Severe Acute Pancreatitis (SAP) may suffer from severe complications like pancreatic necrosis and sometimes it may lead to failure of organs like kidneys, lungs, liver and intestine [1]. The prognosis in these cases is very poor. The main pathogenesis in AP involves activation of the systemic inflammatory cascade and a pancreatic microcirculatory disturbance this leads to pancreatic necrosis (PN).

The exact pathogenesis of pancreatitis is not known. However, it has been known that there is an unequal responses between pro- and anti-inflammatory processes. It causes release of enzymes into the pancreas and peripancreatic tissues, then further release of cytokines and other inflammatory mediators. Finally, all these result in systemic inflammatory response syndrome [2].

Cytokines such as tumor necrosis factor (TNF)- $\alpha$  and interleukin (IL)-1 $\beta$ , interleukin-6, and interleukin-8 also cause further pancreatic damage [2]. TNF- $\alpha$  damages aciner cells and cause PN and damage of other organs such as lungs, liver, intestine, and spleen [3,4]. Mortality rate of SAP is 7–15% [5,6]. Hence, in these patients, we can reduce the mortality by simple prevention of PN. However, there are somany lapses in achieving the purpose of prevention of PN. This study was conducted to examine the clinical features, causative factors, and consequences of AP.

**METHODS**

This study was conducted in the Department of general surgery, S.V.R.R.G.G.H, Sri Venkateswara Medical College, Tirupati, after taking Institutional Ethical Committee from March 2021 to March 2023. One hundred cases are taken for study.

**Inclusion criteria**

The following criteria were included in the study:

1. Patients presenting with AP to the department of general surgery
2. Patients above 18 years who will give informed and written consent.

**Exclusion criteria**

The following criteria were excluded from the study:

1. Patients who are suffering from other acute abdominal illnesses for example acute appendicitis, hollow viscus perforation, nephrolithiasis, ureteric stones, cholelithiasis, blunt injury abdomen, and ovarian cyst torsion
2. Patients with other pancreatic diseases such as pancreatic malignancy and hydatid cyst pancreas.

**Study methods**

Demographic data such as name, age, sex, address, occupation, and comprehensive clinical history will be noted. Written consent will be taken from every patient and included in the study. Patient will be admitted, investigated, and evaluated for general condition and other specific investigative workup is done in view of diagnosis and exclusion of other abdominal pathologies.

Investigations include complete blood profile, liver function test, renal function test, blood sugars, electrocardiogram, and viral markers screening. Specific investigations such as serum amylase and serum lipase, radiological investigations such as X-ray erect abdomen, chest X-ray, ultrasonography, and computed tomography.

**Steps to follow**

1. Diagnosis of AP is to be done after ruling out other abdominal conditions having similar features
2. Assess the severity of the disease
3. Detect any complications and prompt treatment.

## RESULTS

Data collected and analyzed. Bar diagrams and pie charts are used.

### Age and gender distribution

Age group of patients included in this study was 18–70 years. The mean age of presentation is noted in this study was 38–86 years. The peak incidence is present in 4<sup>th</sup> decade. Among 100 patients, 86% were males and 14% were females, showing male predominance as shown in Fig. 1.

### Etiology

Alcohol consumption is the most common causative factor identified in this study which is about 62%. About 30% of patients had biliary pancreatitis with the majority of them having milder disease. About 1% of patients had pancreatitis due to hyperparathyroidism due to parathyroid adenoma. About 1% is due to abdominal trauma and 6% is of unknown etiology.

### Clinical features

Most of the cases presented with pain abdomen (90%) followed by vomiting (77%). Other clinical manifestations are abdominal distention (24%) and jaundice (10%).

### Diagnostic investigations

Serum amylase supported the diagnosis of AP in 76 cases (sensitivity 76%) and serum lipase supported the diagnosis in about 88 cases (sensitivity (88%).

Together serum amylase and lipase picked the diagnosis of AP in 95 cases (sensitivity 95%).

X-ray chest and abdomen were done in all cases but not much helpful in pointing out the diagnosis. These X-rays helped in ruling out of other causes of acute abdominal conditions. Ultrasonographic

(USG) study of abdomen was useful in making diagnosis in 85% of cases.

Computerized tomography (CT) was conducted in all cases and it was known that it supported in almost all cases with high yield information.

### Assessment of severity of AP

All patients were assessed at the time of discharge/death and were classified into mild, moderate, and severe based on CT severity score. Out of 100 cases, 58 patients are of milder disease and 24 are of moderate disease. Eighteen patients suffered with SAP.

### Local complications

Ascites noticed in 23% of patients and were treated conservatively. Acute peritoneal collections were seen in 24% of the patients. Most of them are treated conservatively but 10% have organized fluid collection in the form of pseudocyst, those are treated conservatively but out of which three are not resolved spontaneously, they have undergone cystogastrostomy. Out of eight patients who had acute necrosis on CT scan, three patients developed pancreatic abscess required necrosectomy and remaining 2% are treated conservatively.

### Other complications

About 11% of patients had developed pleural effusion mainly on the left side. Most of them treated conservatively but one patient required pleural tap for symptomatic relief.

### Organ failure and mortality

About 6% of cases developed acute respiratory distress syndrome (ARDS) evident on plain X-ray chest and one required mechanical ventilation. About 6% of patients had acute renal failure (ARF) out of

**Table 1: Etiological distribution**

Etiology	Yes		No	
	No of patients	%	No. of patients	%
Alcohol	62	62.0	38	38.0
Biliary	30	30.0	70	70.0
HP	1	1.0	99	99.0
ID	6	6.0	94	94.0
TR	1	1.0	99	99.0
Chi-square	X <sup>2</sup> =173.875**, (p=0.000), df=4, Significant P<0.001			

**Table 2: Clinical presentations**

Clinical features	Present	%	Absent	%
Abdominal pain	99	99.0	1	1.0
Vomiting	77	77.0	23	23.0
Distention	24	24.0	76	76.0
Jaundice	10	10.0	90	90.0
Fever	35	35.0	65	65.0
Chi-square	X <sup>2</sup> =225.13**, (p=0.000), df=4; Significant P<0.001			

**Table 3: Diagnostic investigations**

Test	Done in	Supported diagnosis (%)	Did not support diagnosis
Sr. Amylase	All	76 (76)	24
Sr. Lipase	All	88 (88)	12
Both	All	95 (95)	5
USG	All	85 (85)	15
CT	All	100 (100)	0

USG: Ultrasonographic, CT: Computerized tomography

**Table 4: Severity of acute pancreatitis**

Acute pancreatitis	No. of patients	%
Mild	58	58.0
Moderate	24	24.0
Severe	18	18.0
Total	100	100.0

**Table 5: Local complications**

Local complications	Present	%	Absent	%
Ascites	23	23.0	77	77.0
APC	24	24.0	76	76.0
Pseudocyst	10	10.0	90	90.0
Necrosis	8	8.0	92	92.0
Chi-square	X <sup>2</sup> =225.13**, (p=0.000), df=4, Significant P<0.001			

**Table 6: Other complications**

Pleural effusion	Frequency	Percent
No pleural effusion	89	89
Pleural effusion present	11	11
Total	100	100

**Table 7: Frequency of systemic complications and death**

Systemic complications	present		Absent	
	No. of patients	Percent	No. of patients	Percent
ARDS	6	6.0	94	94.0
ARF	6	6.0	94	94.0
Death	4	4.0	96	96.0

ARDS: Acute respiratory distress syndrome, ARF: Acute renal failure

Table 8: Comparison of duration of hospital stay

Severity	n	Mean±S.D.	Minimum	Maximum	F-value	p-value
Mild	58	5.29±2.209	3	10	167.374	0.000
Moderate	24	15.17±3.158	10	21		
Severe	18	15.39±3.381	10	21		
Total	100	9.48±5.616	3	21		

Significant at 0.001 level; (p<0.001)

Table 9: Comparison of mean age presentation of various studies

Mean	Kashid et al.	South England Audit	Pupelis et al.	Present study
Age in years	35	54	47	39

Table 10: Comparison of etiology

Etiology	Kashid et al.	Sand et al.	South England Audit	Present study
Alcohol	29.1	70	27	62
Biliary	36.4	20	45	30

Table 11: Comparison of severity of acute pancreatitis by modified CTSI

Severity	Mortele et al.	Present study
Mild	51.15	58
Moderate	33.33	24
Severe	15.15	18

which one patient required mechanical ventilation. Four patients died. Three of those patients died secondarily due to ARDS and one patient died due to ARF (Table 7).

#### Surgical procedures

For matured pseudocyst, three patients had underwent open cysto gastrostomy. Three patients with pancreatic abscess underwent external drainage of abscess. Necrosectomy was done in three patients for PN.

#### Nutritional support

About 21% of patients were given nutritional support of which 12 had received feeding by nasogastric tube, remaining 9% of patients received total parental nutrition.

#### Hospital stay

In the present study, the average hospital stay was 9.48 days. In severe cases, mean hospital stay was 15.39, where as in mild form of disease, it was only 5.29 days (Table 8).

Using the above data and after proper statistical analysis with the analysis of variance test and the p-value is found to be 0.001 which is statistically significant stating that there is a considerable variation between the duration of hospital stay of mild and severe cases (Table 9).

#### DISCUSSION

In this study, the clinical presentation of AP was analyzed and appropriate tests and management were performed based on the diseases etiology, severity, and consequences. In the present study, various etiological factors, different types of clinical presentations, and outcomes were studied. An attempt also made to compare this study with previous similar studies done by others.

#### Age

The mean age of presentation of this study was 39.21 years and is comparable to the study by Kashid et al. [5] which is 35 years. Studies

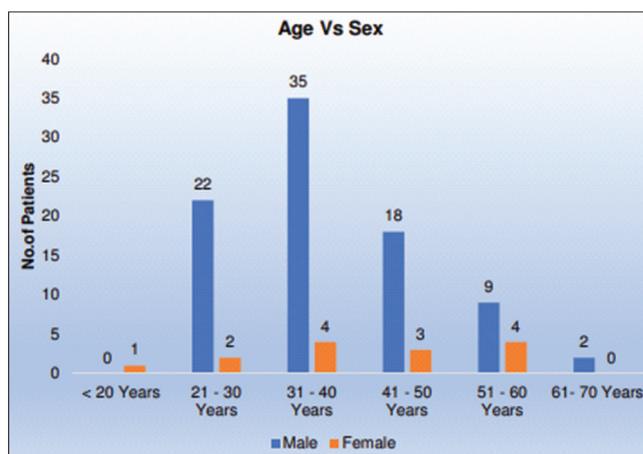


Fig. 1: Age and gender distribution

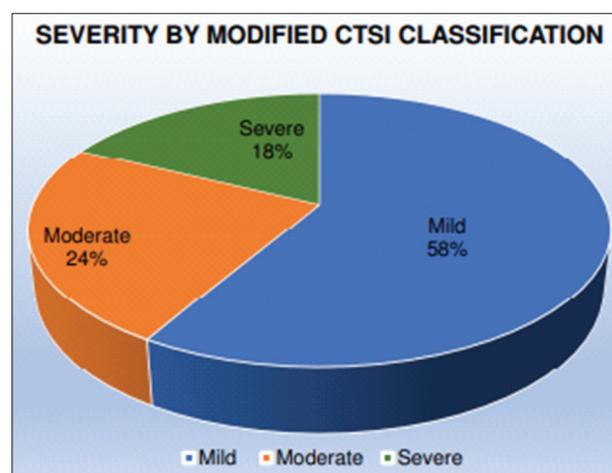


Fig. 2: Severity of acute pancreatitis

conducted by South England Audit [6] had a late presentation of 54 years. Moreover, the study conducted by Pupelis et al. [7] had a mean age of presentation is 47 years. In the present study, most numbers of patients present in 4<sup>th</sup> decade of life. This is likely due to alcohol the primary etiological component in our study which is typically present at a younger age. However, in developed countries, main etiological agent was biliary pancreatitis. Usual mean age of presentation was 5 h/6<sup>th</sup> decade.

#### Sex

In our present study, there was a male preponderance with an M: F ratio of 6.14. Male patients accounting for 86% and female patients accounting for 14%. A study conducted by Kashid et al. [5] had male patients of 70.91% and female are 29.99%. The study conducted by Büchler et al. [8] had 61% of male patients and 39% of female patients. In other studies, male percentage is more but male to female ratio is low. This is mainly attributed to ethanol which was the primary etiological factor in our study and alcohol consumption is more frequent in male population of low socioeconomic status in India.

## Etiology

### Alcohol

In our study, the main cause was found to be the long-term use of alcohol which was 62%. This is similar to the results of a study by Sand et al. [9] which also found that alcohol use was the main cause.

### Gallstone pancreatitis

In our study, biliary pancreatitis is second most common cause associated with AP which is 30% which is comparable to study conducted by Kashid et al. [5] shows that biliary pancreatitis is about 36.4% (Table 10).

### Hypercalcemia

In our study, about 1% of case had AP due to hyperparathyroidism due to parathyroid adenoma (Table 1).

### Idiopathic AP

In our study, 4% of cases were identified to have unknown etiology.

## Clinical features

### Pain abdomen

In the present study, 99% of patients presented with pain abdomen which is comparable to study conducted by Kashid et al. [4] had 92.73% of patients presented with pain abdomen.

### Nausea and vomiting

In our study, about 77% of patients presented with nausea/vomiting which is comparable to study conducted by Kashid et al. [4] had 60% of patients with nausea and vomiting.

Abdominal distention: In our study, 24% of patients had abdominal distention whereas the study conducted by Kashid et al. [4] had 16.32% of patients presenting with abdominal distention.

### Jaundice

In our study, 10% of patients presented with jaundice which is comparable to the study by Kashid et al. [4], they have 7.27% (Table 2).

### Serum amylase sensitivity

In our study, the sensitivity of serum amylase in diagnosing the pancreatitis is 76% which is comparable to the study done by Sekimoto et al. [10], it has sensitivity of 95.6%. This is attributed to alcohol which is main etiological factor in our study where raising serum amylase is less compared to biliary pancreatitis.

### Accuracy of USG examination of abdomen

In the present study, USG examination of abdomen was diagnostic in 88% of patients and this was comparable to the study by Ammori et al. [11] which was diagnostic in 86% of patients. The study conducted by Kashid et al. [4] 66.67% of patients are diagnosed by ultrasound abdomen (Table 3).

### Comparison of severity of AP by modified CT severity index

In the present study, out of 100 cases, 58% had milder diseases, 24% of patients have moderate form of disease, and 18% had severe form of disease which is comparable to the study conducted by Mortelet et al. [12] who had 51.15%, 33.33%, and 15.15% have milder, moderate, and severe disease, respectively as shown in Fig. 2 and Tables 4 and 11.

## Complications

About 24% of cases developed acute fluid collections. About 10% developed pseudocyst of pancreas. About 8% had pancreatic necrosis (Tables 5 and 6).

## CONCLUSION

This prospective study conducted in department of general surgery in S.V.R.R.G.G.H, Sri Venkateswara Medical College, Tirupati, included

100 patients with AP, 86 males and 14 females (M: F~6.14). Peak incidence was noted in the fourth decade with mean age 38.86 years. Alcohol is the most common etiology being identified of about 62% of cases followed by gallstones 30%. The most common presenting complaints were abdominal pain and vomiting. The combination of serum amylase and serum lipase provided high sensitivity (95%) for the diagnosis of AP. Computed tomography was a non-invasive method of diagnosing and imaging complications. Acute peripancreatic collections were seen in 24% of the patients, and pseudocysts were seen in 10%. The mean hospital stay was 9.48 days. Out of 100 patients, mild disease seen in 58%, moderate disease observed in 24%, and in about 18% severe disease was seen. The overall mortality rate was 4%. In the present study, the incidence of AP was higher in the younger age group, primarily due to alcohol. Wherever possible, serum amylase and serum lipase were both used for diagnosis (95%). Ideally, all cases should be severity stratified within 48 h using one of the scoring systems that aids in disease prediction. Severe cases may require well equipped ICU who require massive fluid resuscitation, mechanical ventilation, and hemodialysis. Support of specialists in radiology, endoscopy, and intensive care unit is essential. Prompt intervention by endoscopists and surgeons is crucial in reducing mortality and morbidity. Early cholecystectomy and abstaining from alcohol helped to prevent recurrent attacks.

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Nil.

## AUTHORS CONTRIBUTION

Nil.

## CONFLICTS OF FINTEREST

Nil.

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Nil.

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