

## CLINICO-EPIDEMIOLOGICAL STUDY OF ACUTE PANCREATITIS IN TERTIARY CARE CENTER

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2023; 5 (3); 349-353**Abstract**

**Background:** Acute pancreatitis (AP) is an inflammatory process of the pancreas with varying degree of involvement of regional tissues. This was a population-based study on the incidence of AP. We aimed to determine the incidence, etiology, and outcome of AP. **Materials and Methods:** This Cross-sectional study was conducted in the Department of General surgery, Govt. Medical College & STM hospital, Haldwani, India, on 150 patients of AP. Clinical history, examination, and laboratory investigations were done. Severity of AP was assessed using the modified Atlanta classification. **Result:** A total of 150 patients comprising of 110 men (73.33%) and 40 women (26.66%) were recruited. The mean age of study participant was 55.15±11.01 years. The most common presentation was abdominal pain followed by vomiting. The leading etiological factors were alcohol in 68 patients (45.3%) and gallstones in 51 (34%). It was idiopathic 22 patients (14.7%). Mortality was seen in 10 (6.7%) patients, all of which had severe pancreatitis. Patients with body mass index (BMI) ≥25 kg/m<sup>2</sup>, Hematocrit (HCT) ≥44% and C-reactive protein (CRP) ≥150 mg/l had an increased risk of developing a severe AP. **Conclusion:** Alcohol and gallstones were the most common etiological factors of AP, whereas HCT, CRP, and BMI were the useful predictors of severe pancreatitis.

## INTRODUCTION

Acute pancreatitis (AP) is defined as the inflammation of the pancreatic tissue, characterized by parenchymal edema and necrosis caused by auto-digestion by its own glandular enzymes leading to multi-organ failure or death.<sup>[1]</sup> In the past few decades, there have been many advancements in the intensive care of patients with AP due to its association with high morbidity and mortality.<sup>[2]</sup> As per the Indian data, no multicentric studies available only sporadic data were analyzed, thus the exact prevalence could not be assessed. The incidence was calculated from the patients admitted at different tertiary care centers all over the country.<sup>[3]</sup>

For the management and prevention of recurrence of the disease, its etiology is to be ascertained. The two most common etiological factors, namely alcohol and gallstones contribute 80% of the cases, with alcoholic pancreatitis being much more common.<sup>[4-7]</sup> Recent recommendations state that the etiology of AP should be established in at least 80% of cases with not more than 20% being classified as idiopathic.<sup>[8]</sup> Planning the management and delivery

of care for AP requires the knowledge of the etiology as well as severity of the disease.

The severity of pancreatitis varies from mild and self-limiting to severe and fatal.<sup>[1]</sup> Severity is an important indicator of mortality and the need for intensive care, nutritional support, urgent surgical intervention, and antibiotic usage.<sup>[8]</sup> Various scoring systems have been devised for AP such as the Atlanta Criteria,<sup>[9]</sup> which relies on evidence of organ failure and/or local complications as well as Acute Physiology And Chronic Health Evaluation II (APACHE II).<sup>[10]</sup> Ranson et al,<sup>[11]</sup> and modified Glasgow,<sup>[12]</sup> scores based on clinical and laboratory values that assess systemic inflammation and the Balthazar Score which is based on computerized tomography (CT) findings.<sup>[13]</sup> For the diagnosis and prognostication contrast-enhanced scoring system is good because it improves the identification at early stage with high sensitivity (100%) and accuracy (87%) by the detection of extended areas of necrosis within the pancreatic region.<sup>[13]</sup>

Severe AP occurred in 20% patients of AP with mortality rates of 10%–30%.<sup>[7]</sup> Patients with AP have a high risk of morbidity due to local complications include pancreatic pseudocyst, pleural

effusion, peritoneal collection, and pancreatic necrosis with superimposed infection, which has the highest mortality rate of 30%.<sup>[13]</sup> The systemic complications are either single or multiorgan failure (MODS). Deaths from pancreatitis occurring during the first 2 weeks of the illness are due to multiple organ dysfunction syndrome (MODS),<sup>[14-16]</sup> whereas deaths after 2 weeks are generally caused by pancreatic necrosis with superimposed infection.<sup>[13]</sup> According to the recent guidelines, mortality from AP should be <10% overall and <30% in severe cases.<sup>[8]</sup> Furthermore, all patients with severe pancreatitis or with organ failure should be managed in the high dependency unit or intensive care unit.<sup>[8]</sup> Due to the lack of prevalence data of the disease in our country, changing trends of severity, complexity of the disease, and changing trends in the outcome, prompted us to undertake this study with aim to determine the demographic profile, etiology, severity, and outcome of AP.

## MATERIALS AND METHODS

This prospective study was conducted in Govt. Medical College & STM Hospital, Haldwani, Uttarakhand, India, for 21 months from January 2021 to September 2022 in the department of general surgery in collaboration with the department of radiology. Ethical clearance was obtained from the Institutional Ethics Committee, Govt. Medical College, Haldwani, and a written (or verbal) informed consent for participation was obtained from the patients (or their relatives). A total of 150 cases of AP were enrolled in this study. All patients age >18 years and admitted in indoor and fulfilling two out of three criteria. (i) Abdominal pain characteristic of AP, (ii) serum amylase and/or lipase levels at least three times the upper limit of normal, and (iii) characteristic findings of AP on abdominal ultrasonography and/or CT scan were included in the study as per the Atlanta Classification 2012.<sup>[9]</sup>

Patients who were suffering from chronic pancreatitis based on their hospital records or had radiological findings of pancreatic calcifications, dilated pancreatic duct, areas of atrophy, and pseudo cysts were excluded from the study.

After detailed history and physical examination, laboratory investigations requested at the time of admission included arterial blood gas analysis, hematocrit, kidney function test, liver function test, serum electrolytes, serum amylase, serum lipase, and complete hemogram. Abdominal ultrasonography was done at the time of admission and contrast-enhanced pancreatic CT scan was done after 72 h of hospitalization.

Patients were subsequently examined daily, and relevant laboratory investigations such as complete hemogram, blood sugar, serum amylase, serum lipase, and serum calcium were done on every 48 h; bedside index for severity in acute pancreatitis (BISAP) was calculated within first 24 h of admission, while Ranson's score was evaluated within first 48 h of admission. Moreover, APACHE II score was evaluated for each patient after 72 h of admission were calculated.

Patients with mild AP had neither local complications nor organ failure. Patients with moderately severe AP had transient organ failure or local complications or both, whereas patients with severe AP had persistent organ failure. Organ failure was defined based on the Modified Marshall scoring system. A score of  $\geq 2$  for more than 48 h was considered as persistent organ failure, whereas a score of  $\geq 2$  for <48 h was considered transient organ failure. Local complications included pancreatic necrosis, acute fluid collections, pseudo cyst, acute necrotic collections, and walled off necrosis. All the patients were managed as per the standard protocol.

### Statistical Analysis

The statistical analysis was done using IBM SPSS (Statistical Package for the Social Sciences) Version 21.0 Armonk, NY, USA; IBM Corp. Continuous variables were described as mean  $\pm$  standard deviations at 95% confidence intervals. Categorical variables were presented as proportions. Student's t-tests, one-way analysis of variance, and Pearson Chi-squared tests were used in the univariate analysis to evaluate statistical associations. Multiple logistic regression was utilized to identify the independent predictors of mortality based on which odds ratios were calculated. Risk factors that are found to be significant in univariate analyses are considered in the multiple regression model. A two-sided  $P < 0.05$  was considered statistically significant.

## RESULTS

During a period of 21 months, 28,567 patients were admitted in indoor wards. Out of these total 150 patients with acute abdomen, who were diagnosed with AP based on elevated serum amylase and/or lipase levels and radiological findings on ultrasound and CT abdomen were included in this study. Age of patients ranged from 24 to 70 years, with a mean age of  $55.15 \pm 11.01$  years. Majority of the patients 100 (66.7%) were between 41 and 60 years. There were more males (73.3%) than females (26.7%) with a male-to-female ratio of 2.75:1. The mean body mass index (BMI) of patients was  $18-24.99(69.3\%) \text{ kg/m}^2$ .

**Table 1: Distribution of patients according OT gender**

Sex	Frequency	Percent
Female	40	26.7
Male	110	73.3
Total	150	100

**Table 2: distribution of patients according to age**

Age group	Frequency	Percent
<40	8	5.3
41-50	55	36.7
51-60	45	30
61-70	39	26
>70	3	2
Total	150	100

The mean length of hospital stay was  $12.30 \pm 3.50$  days for the entire study. Based on the severity of AP, the mean length of hospital stay in patients with mild AP was  $6.08 \pm 2.22$  days,  $11.97 \pm 3.47$  for moderate AP, and  $18.71 \pm 5.87$  for severe AP. Majority of the patients were successfully discharged 140 (93.3%) from the hospital after treatment of their acute condition while death occurred in 10 (6.7%) of the study population due to multiple organ failure. Out of the 10 patients who died during the study period, 8 patients had severe pancreatitis and 2 patients had moderate pancreatitis. Disease severity was determined on the basis of the BISAP score at the time of admission and after 48 h (based on CT severity index score).

**Table 3: Distribution of patients according to etiology**

Etiology	Frequency	Percent
ALCOHAL	68	45.3
GALL STONES	51	34
ERCP	9	6
IDIOPATHIC	22	14.7
Total	150	100

Among etiological factors, alcohol was the most common cause found in 68 (45.3%) patients, followed by gallstones in 51 (34%), idiopathic in 22 (14.7%) patients and postendoscopic retrograde cholangiopancreatography AP in 9 (6%). All (100%) of the patients had a history of abdominal pain. Other presenting symptoms and signs were nausea and vomiting in 62.7%, jaundice in 3.3%, pleural effusion in 20.8%, ascites in 25%, and abdominal tenderness in 100% of the study population. In the subgroup analysis, jaundice, pleural effusion, and ascites were absent in mild AP.

**Table 4: Distribution of patients according to symptoms**

Symptoms	Frequency	Percent
EPIGASTRIC PAIN	150	100
NAUSEA AND VOMITING	94	62.7
GUARDING	73	48.7
ABDOMINAL DISTENSION	67	44.7
RADIATION OF PAIN	21	14
ICTERUS	5	3.3

**Table 5: Grouped Data Analysis**

	Mild (n=36)		Moderate(n=58)		Severe (n=28)			P-value
	Mean	SD	Mean	SD	Mean	SD		
AGE	51.67	8.18	52.93	10.12	58.75	10.38	4.81	0.01
BMI	20.98	2.77	22.16	4.73	21.67	3.94	1.02	0.36
Duration of symptoms	9.00	3.87	10.55	3.78	13.82	6.09	10.15	<0.001
hospital stat duration	6.08	2.22	11.97	3.47	18.71	5.87	87.06	<0.001
TLC (103/cc)	11.85	8.06	10.22	6.77	8.94	6.22	1.41	0.25
Platelet Count	230.89	60.89	241.27	68.89	242.68	72.64	0.35	0.71
Total Bilirubin	0.96	0.13	1.11	0.24	1.08	0.20	6.23	<0.001
ALP	83.69	9.78	80.88	6.95	83.18	9.38	1.87	0.16
S. Urea	28.64	5.93	29.87	5.86	28.46	5.25	0.95	0.39
S. Amylase	163.94	25.37	242.45	69.39	409.96	168.62	60.32	<0.001
S. Lipase	171.86	25.70	207.15	56.35	428.14	205.69	64.06	<0.001

## DISCUSSION

AP is a relatively common disease with the incidence of 5–80 per 100,000 population worldwide. The spectrum of the disease is wide, varying from mild attacks with mild epigastric discomfort to multiorgan dysfunction and death. The mild attacks often go undiagnosed leading to recurrence. The overall mortality of AP is static at

1%–2% but increasing to 10%–30% in severe AP.<sup>[7]</sup> Although its prevalence varies in different countries and even indifferent areas of a given country, there has been a significant increase in the number of new cases in recent years.<sup>[17]</sup> Early diagnosis and prompt treatment are the mainstay of the therapy in AP to significantly decrease morbidity and mortality. In this study Maximum patients with acute pancreatitis were in age group 41-60 years

comprising of approximately 100 (66.7%) of total population. This was followed by 61-70 years with 26% of the patients. the mean age of the patients was 55.15±11.01 years. The age range of the patients was 34-82 years. The results of the present study were similar to Manjunath B. D et al,<sup>[23]</sup> who reported the mean age to be 54.5 years. In a study by Kaushik MR et al (2017),<sup>[19]</sup> the mean (±SD) age was 43.74±16.85 years, with a range of 21 to 84 years. Katta VR in 2016,<sup>[20]</sup> conducted a study in which the mean age was 46.31 ± 17.01 years. In our study, abdominal pain was the common presenting complaint in all patients (100%), and this is similar to what was reported by Negi et al,<sup>[17]</sup> and Rao,<sup>[18]</sup> also reported similar pattern of vomiting, fever, and pleural effusion, as found in this study.

Out of 150 patients 110(73.3%) patients were males and 40(26.7%) patients were females. Male: female in present study was 2.75:1. Veena P et al,<sup>[21]</sup> in 2020 90% were males and 10% were females. Males to females ratio was 9:1, in a study by Kaushik et al,<sup>[19]</sup> 82% cases were male and 18% were women. 78.43% of our patients were males in a study by Katta et al.<sup>[20]</sup> In a study by Arif et al,<sup>[22]</sup> 39.3% patients were male while 60.7% patients were Female. The results of the present study were in accordance with the previous studies.

Death was reported in 6.7%(10) patients while 93.3%(140) cases were discharged. The mortality of various study varied from 3.5%-16%. In present study the mortality was less as compared to other study, this could be due to small sample size.

Majority patients were within healthy BMI range i.e. 1-24.99(69.3%) followed by underweight i.e. <18(16%) overweight i.e. 25.29-29.99 (8.7%) and obese category i.e. >30(6%). Also in present study we observed that total 22.7% patients had diabetes while 7.3% presented with hypertension. In a study conducted by Rahman et al out of 30 study patients 8(26.7%) had been suffering from different co-morbidities like hypertension, Diabetes mellitus, chronic kidney disease, autoimmune disorders, Coronary artery disease etc; one(3.3%) patient had multiple co-morbidities. Bhattacharjee et al observed the total number of patients with diabetes was to be 44.8%<sup>69</sup>.

#### **Limitation of Study**

This was a single-center study in tertiary care center, and findings may have been due to referral bias and not reflective of the community. Serum HCT and serum CRP were done only at the time of admission. Despite the limitation, the study provides an insight into the validity of the different prognostic indicators in the assessment of severity of AP.

## **CONCLUSION**

The present study again emphasizes the significance of early assessment of severity and intensive care management in acute pancreatitis. Acute pancreatitis is a common cause of acute abdomen in patients

presenting to the emergency department. Alcohol was the predominant etiology of acute pancreatitis, mostly affecting middle aged Male. A higher number of male patients presented with the disease as compared to females. In our study population pain abdomen, nausea and vomiting were the most common symptoms. Clinical assessment along with CT findings correlated well with morbidity and mortality. Patients with systemic complications had adverse outcome.

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