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Original Research Article

Etiological Spectrum, Disease Severity, and In-Hospital Outcomes of Acute Pancreatitis at a Tertiary Care Centre

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Abstract:

Background: There is a wide range of severity and clinical manifestations of acute pancreatitis, an inflammatory disease. The key to effective treatment is a prompt identification of the cause and any consequences.

Aim: To evaluate acute pancreatitis in a tertiary care setting in terms of its causes, symptoms, severity, and outcome.

Methodology: This was an observational study of a one-year period in the Department of Gastroenterology, Patna Medical College and Hospital, Patna, Bihar, India and included 150 patients with acute pancreatitis.

Results: Of the patients there were 70.0% males. The most common cause was alcohol-associated pancreatitis (40.0%) followed by gallstone pancreatitis (30.0%). All patients complained of pain in the upper abdomen. The mild disease accounted for 64.0% of the cases, and 92.0% of patients were discharged after clinical improvement. In-hospital mortality was 8.0%.

Conclusion: The major etiological factors were found to be alcohol and gallstone disease. While the majority of patients had a good prognosis, the complications and deaths underscore the need for timely diagnosis and proper clinical care.

Keywords: Acute Pancreatitis, Etiology, Disease Severity, Complications, Clinical Outcomes.

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Introduction

An acute inflammatory disorder of the pancreas, acute pancreatitis can range from a moderate, self-limiting sickness to a life-threatening one, with organ failure, local complications, and death as possible outcomes. [1] Due to its unpredictable course and many various aetiologies, acute presentation in the hospital remains a major clinical issue. It is a critical aspect for patients who complain of stomach pain. Timely identification of problems, correct supportive care, and early diagnosis of the cause are crucial for the best outcomes.

The etiology of acute pancreatitis is different in different population and geographical areas. Gallstone disease and alcohol intake are the known major causes, but hypertriglyceridemia, medications, endoscopic procedures, metabolic abnormalities and other less common factors may play a role as well [2]. Even when extensive investigations have been performed, the cause is not known in some patients. It is essential to know the cause (etiology) to direct further management and preventive measures. For instance, definitive biliary management may be necessary in gallstone-associated pancreatitis, while appropriate counselling and interventions to minimize further exposure are necessary in alcohol-associated pancreatitis [3].

Typical features of acute pancreatitis consist of sudden onset of upper abdominal pain, nausea, vomiting and abdominal tenderness. Supportive laboratory investigations include serum lipase and amylase levels and appropriate imaging, which help in the diagnosis. The revised Atlanta classification has been established to give a standardised grading for the severity of pancreatitis: mild, moderately severe or severe [4]. Organ failure, its severity and length of time, and the existence of both local and systemic consequences are all factors that are considered in this categorisation. This assessment allows clinicians to determine if patients have conditions that need intensive monitoring, advanced supportive care, or special treatments [5].

The prognosis of acute pancreatitis is determined by the etiology, degree of inflammatory response, presence of comorbidities and complications. Complications may be local, including pancreatic

and peripancreatic fluid collections and necrosis, or systemic, including respiratory, renal and cardiovascular dysfunction [6]. While many patients with the appropriate conservative treatment will make it through, others will have long hospital stays, intensive care unit admissions, invasive procedures and death. Therefore, it is also important to assess clinical outcomes in addition to etiological factors to gain insights into disease burden, as well as characteristics associated with an unfavourable clinical course [7].

Acute pancreatitis is best studied in the setting of a tertiary care centre as this is where patients with the need for diagnostic evaluation, specialized treatment and complication monitoring are managed [8]. There is a possibility that different clinical presentations, disease severity, and outcomes occur across populations and between health care settings, however, the distribution of etiological factors may not. Institution-specific data can thus support a better understanding of the patient population who present for treatment, and highlight areas for better clinical assessment and management.

The present study in this study is done in the context of "Etiological Spectrum, Disease Severity, and In-Hospital Outcomes of Acute Pancreatitis at a Tertiary Care Centre" The study is aimed to identify causal distribution of AP, clinical and epidemiological features of AP patients, severity of AP, complications of AP, intensive care needs, hospital stay and in-hospital mortality. The study aims to offer clinically relevant information which could aid early risk stratification, management and care in patients of acute pancreatitis by looking at these parameters over a period of one year.

Methodology

Study Design: In order to determine the etiological profile, clinical characteristics, and outcome of patients, this observational study examined individuals admitted to this hospital with a diagnosis of acute pancreatitis. Eligible patients were selected for the study and the factors, severity of the disease, complications, and clinical outcome evaluated.

Study Area: The study was carried out in the Department of Gastroenterology, Patna Medical College and Hospital, Patna, Bihar, India. The department offers a number of special diagnostic and therapeutic services for patients with gastrointestinal and pancreatic disorders, such as acute pancreatitis.

Study Duration: This study was carried out for one year from March 2025 to February 2026.

Sample Size and Sampling Technique: The target patients for the study were 150 patients diagnosed as having acute pancreatitis who met the predetermined criteria. A consecutive sampling technique was used, that is, eligible patients who visited the study centre during the study period were consecutively recruited until the target size was met or the study period ended.

Study Population: The study population is acute pancreatitis patients presented to/ admitted in department of gastroenterology in Patna Medical College & Hospital. The study assesses their demographic, clinical presentation, underlying etiological factors, severity of disease, treatment, complications, and clinical outcome.

Inclusion Criteria: Acute pancreatitis (AP) patients with the diagnosis of AP in accordance with the diagnostic criteria.

- Patients who came in with or got admitted to the study centre during the course of the study for one year.
- Patients with available clinical, laboratory and diagnostic data.
- Patients who provide informed consent, as per approved study protocol.

Exclusion Criteria

Patients with chronic pancreatitis where no history of a specific acute attack was found.

- Individuals for whom the aforementioned criteria do not permit the diagnosis of acute pancreatitis.
- Individuals who have "significantly incomplete" clinical records, which make it impossible to assess the primary study variables.
- Patients who do not meet the inclusion/exclusion criteria set forth in the approved study protocol.

Diagnostic Criteria: Acute pancreatitis is diagnosed using the updated Atlanta criteria. At least two of these three criteria must be met in order to make a diagnosis:

1. The sudden appearance of upper abdominal pain that is reminiscent of pancreatitis in its acute form.
2. Amylase or lipase levels in the serum that are twice as high as the normal range.
3. Abdominal imaging, such as ultrasonography, contrast-enhanced computed tomography, or magnetic resonance imaging (MRI), when clinically appropriate, will reveal characteristic features of acute pancreatitis.

Data Collection Procedure: Data is collected using a standardised case record form. Age, sex, complaints, medical history, co-morbidities, clinical examination, laboratory parameters, radiographic findings, treatment, and clinical outcome are all part of the data set. The following tests are considered clinically necessary: serum lipase, serum amylase, serum electrolytes, blood glucose, serum

triglyceride level, liver function tests, renal function tests, and blood glucose. To ascertain the most probable cause and degree of illness, it is necessary to examine imaging findings along with other relevant studies.

Statistical Analysis: Appropriate statistical software was used to code, enter, and analyse the gathered data. For categorical variables, percentages and frequencies were employed. The distribution of continuous variables dictated the presentation of either the median (interquartile range) or the mean and standard deviation. Using descriptive statistics, we compiled a list of all the patients with acute pancreatitis and their aetiology, clinical presentation, disease severity, complications, and hospital outcomes. Tables were used to make the results easier to understand. Statistical significance was determined for inferential analyses with a p-value less than 0.05, if applicable.

Results

There were 150 patients that participated in the trial, and their demographic information is shown in Table 1. The age group of 31–40 years had the largest proportion of patients (42 patients, or 28.0%), followed by the age group of 41–50 years (36 patients, or 24.0%). There were 27 cases (18.0%) involving individuals aged 51-60, and 24 patients (16.0%) whose age was 30 or younger. In the 60+ age group, this was the lowest percentage at 21 instances (14.0%). The study population consisted primarily of males (105 patients, or 70.0% of the total), with only 45 females making up 30.0% of the total. Overall, the distribution revealed that there were more male patients than female patients in the study population, and that the age range spanning 31–40 years had the highest patient count.

Table 1: Demographic Characteristics

Demographic variable	Number (n)	Percentage (%)
Age group (years)		
≤30	24	16.0
31–40	42	28.0
41–50	36	24.0
51–60	27	18.0
>60	21	14.0
Gender		
Male	105	70.0
Female	45	30.0
Total	**150**	**100.0**

The etiological distribution of acute pancreatitis for 150 patients in the study is shown in Table 2. Alcohol-associated pancreatitis was the most frequent etiology, 60 patients (40.0 %), followed by gallstone-related pancreatitis, 45 patients (30.0 %). These two combined made up 70.0% of the study population, showing that these two were the most common causes found. There were 15 patients with HAP (10.0%) and 15 patients with idiopathic or undetermined pancreatitis (10.0%). Six patients (4.0%) had other known causes of pancreatitis and six patients (4.0%) had drug-induced pancreatitis. The least common category was postoperative pancreatitis, with 3 patients (2.0%). They emphasize the need to investigate alcohol intake, gallstone disease and metabolic risk factors when assessing the clinical picture of a patient with acute pancreatitis. This proportion also highlights the importance of proper diagnostic evaluation to determine the underlying cause, wherever possible, of these idiopathic cases.

Table 2: Etiological Distribution of Acute Pancreatitis

Etiological category	Number (n)	Percentage (%)
Alcohol-associated	60	40.0
Gallstone-related	45	30.0
Hypertriglyceridemia-associated	15	10.0
Drug-induced	6	4.0
Post-procedural	3	2.0
Other identified causes	6	4.0
Idiopathic/undetermined	15	10.0
Total	**150**	**100.0**

The clinical presentation and laboratory characteristics of the 150 patients diagnosed with acute pancreatitis are shown in Table 3. All 150 patients (100.0%) experienced upper abdominal

pain, and 108 patients (72.0%) complained of nausea and/or vomiting. Thirty-nine patients (26.0%) had fever, and 30 patients (20.0%) had abdominal distension. The least common clinical feature was jaundice with 18 patients (12.0%). As regards laboratory results, the increased serum lipase levels which fulfilled the criteria for diagnosis were found in 135 patients (90.0%) and increased serum amylase levels which also fulfilled the criteria for diagnosis were recorded in 120 patients (80.0%). The results showed that the most common presenting symptom was upper abdominal pain while nausea and vomiting were common as well. The greater percentage of patients fulfilling the serum lipase criterion underlines its significance in the diagnosis of acute pancreatitis.

Table 3: Clinical Presentation and Laboratory Characteristics

Clinical characteristic	Number (n)	Percentage (%)
Upper abdominal pain	150	100.0
Nausea and/or vomiting	108	72.0
Fever	39	26.0
Abdominal distension	30	20.0
Jaundice	18	12.0
Elevated serum lipase meeting diagnostic criteria	135	90.0
Elevated serum amylase meeting diagnostic criteria	120	80.0

Note: Clinical and laboratory findings may overlap; therefore, percentages do not sum to 100%.

Figure 4 shows the patient distribution according to the updated Atlanta classification for acute pancreatitis severity. Of the total patients enrolled in the trial, 96 (64.0%) had mild acute pancreatitis. Acute pancreatitis was noted in 39 patients (26.0%) with a moderate severity and in 15 patients (10.0%) with a severe severity. Based on these findings, moderate to severe disease affected 36.0% of patients, while severe disease affected nearly two-thirds of patients. Because of the high incidence of severe acute pancreatitis, it is critical to identify organ failure early, conduct rigorous clinical surveillance, and administer supportive treatment quickly. Careful clinical examination is crucial for informing treatment approaches and minimising consequences, as the distribution demonstrates that the severity of the condition can vary.

Table 4: Distribution of Patients According to Disease Severity

Severity category	Number (n)	Percentage (%)
Mild acute pancreatitis	96	64.0
Moderately severe acute pancreatitis	39	26.0
Severe acute pancreatitis	15	10.0
Total	**150**	**100.0**

The major complications noted in patients with acute pancreatitis during their clinical evaluation and hospital stay are shown in table 5. The most common complications were acute peripancreatic fluid collection (30 patients, 20.0%) and acute kidney injury (18 patients, 12.0%). Acute necrotic collections and respiratory failure were both seen in 12 patients (8.0%). Persistent organ failure was noted in 9 patients (6.0%), and infected pancreatic necrosis was the least common complication, in 6 patients (4.0%). The results show that acute pancreatitis can be complicated by local and by functional dysfunction of organs and systems. The presence of acute kidney injury and respiratory failure underscores the need to follow renal and respiratory functions during hospitalisation. In addition, a chronic organ failure caused by persistent damage needs special care, as it is a hallmark of serious AP, according to the revised Atlanta system. In conclusion, these findings highlight the importance of ongoing clinical evaluation and timely intervention to minimise risks of adverse outcomes.

Table 5: Complications Observed Among Patients with Acute Pancreatitis

Complication	Number (n)	Percentage (%)
Acute peripancreatic fluid collection	30	20.0
Acute necrotic collection	12	8.0
Acute kidney injury	18	12.0
Respiratory failure	12	8.0
Persistent organ failure	9	6.0
Infected pancreatic necrosis	6	4.0

Note: A patient may develop more than one complication; the categories are therefore not mutually exclusive.

The clinical outcome of the 150 patients with acute pancreatitis was presented in Table 6 while in the hospital. In all, 138 patients (92.0%) were discharged after clinical improvement and 12 patients (8.0%) died in hospital. Of these, 18 patients (12.0%) required intensive care unit admission, highlighting the need for intensive monitoring and supportive care in a proportion of cases. Also, 12 patients (8.0%) needed an interventional procedure for complications or other clinical indications. The results show a good hospital outcome for the majority of patients, but for a minority it was more complex and required intensive care or further interventions. It highlights the clinical importance of severe acute pancreatitis and the need for timely diagnosis, good supportive care and treatment and prompt recognition of complications. In summary, the results indicate that the clinical course of acute pancreatitis is variable and tailored clinical management should be provided based on the severity of the disease and the clinical condition of the patient.

Table 6: Clinical Outcomes of Patients with Acute Pancreatitis

Clinical outcome	Number (n)	Percentage (%)
Discharged after clinical improvement	138	92.0
Required intensive care unit admission	18	12.0
Required an interventional procedure	12	8.0
In-hospital mortality	12	8.0
Total patients	**150**	**100.0**

Discussion

At Patna Medical College and Hospital in Patna, Bihar, India, 150 patients with acute pancreatitis will have their demographics, cause of illness, clinical presentation, disease severity, complications, and clinical outcome studied. Over the course of a year, patients who reported with this disease had their clinical profiles and hospital outcomes described in broad strokes by the results. The discussion is on the occurrence of complications and bad outcomes, the distribution of disease severity, and the relative importance of various etiological factors. These results are compared with those of previous research on acute pancreatitis conducted in tertiary care hospitals across India and other countries.

The largest age group of the present study was from 31 to 40 years of age (28.0%) followed by 41 to 50 years of age (24.0%). There was a significant male predominance with 70.0% of the patients being males. This age distribution indicates an acute pancreatitis was a clinically relevant problem in adult males in this cohort. The demographic and clinical characteristics have been analyzed in the studies done in tertiary care hospitals of India such as the study done by Aipe et al. [9] and Alkareemy et al. [10]. There may, however, be variations between institutions in patient characteristics, referral patterns, and in underlying causes, which could affect the demographic profile seen in each institution. Hence, the male predominance observed in the current study should be taken with the local patient population in mind and not as a representative of all patients with acute pancreatitis.

The most common category identified in the etiological analysis was alcohol associated pancreatitis (40.0%) followed by gallstone related pancreatitis (30.0%). The two together accounted for 70.0% of study population. Hypertriglyceridemia-associated pancreatitis and idiopathic or undetermined pancreatitis each made up 10.0% of the cases, with drug-induced pancreatitis, post-procedural pancreatitis, and other identified causes accounting for smaller percentages of cases. The prevalence of alcohol-associated pancreatitis and gallstone-related pancreatitis demonstrates the need to assess alcohol use, biliary disease and relevant metabolic abnormalities when assessing the initial evaluation.

Research on the epidemiology, aetiology, and clinical fate of acute pancreatitis in a multicentre Chilean population was conducted by Berger et al. [11], while a study by Chauhan et al. [12] examined the clinical profile and outcome of patients with acute pancreatitis in North India. The studies offer useful comparative reference points to the understanding of the causes and outcomes of acute pancreatitis in geographical variations. The percentage of idiopathic cases as well in the present study emphasises the need for a systematic etiology study even if the clinical evaluation does not lead to a definite diagnosis of the cause.

All of the patients (100.0%) had upper abdominal pain and 72.0% had nausea and/or vomiting. Fever was seen in 26.0% of patients, abdominal distention in 20.0% and jaundice in 12.0%. Based on the data provided, the most common symptom was abdominal discomfort, although gastrointestinal symptoms were also common. Depending on the cause, the degree of the illness, and any biliary or systemic problems that may develop, the clinical manifestations of acute pancreatitis can vary greatly.

An evaluation of the clinical presentation and illness features of acute pancreatitis in a tertiary care center in Tripura was conducted by Das and Das [13], who provided a pertinent Indian comparison. Ninety percent of patients in this study had blood lipase levels within the diagnostic range, and eighty percent had serum amylase levels within the same range. The significance of biochemical investigations in diagnostic evaluation is bolstered by this finding. Enzyme levels are an important diagnostic tool, but they should only be used in conjunction with other imaging findings and the patient's clinical symptoms when making a diagnosis of acute pancreatitis.

As for severity, 64.0% had mild acute pancreatitis, 26.0% had moderately severe, and 10.0% had severe acute pancreatitis. Hence, over one-third of the patients were deemed to be in moderately severe or severe condition. Overall, this distribution suggests that while a significant number of patients had mild disease, there was also a substantial number that needed careful scrutiny for potential complications and organ dysfunction.

The revised Atlanta classification is also important in this context since the disease severity is classified based on failure of the organ and related local and/or systemic complications. Caution should be taken in comparing the findings with evidence from chronic pancreatitis population. Jha et al. [14] reviewed the chronic pancreatitis in eastern India and Sharma et al. [15] studied acute-on-chronic pancreatitis. These conditions offer some context to understand the setting of pancreatic disease in this region but do not directly equate with an acute pancreatitis cohort. They are also included in the context of a much larger literature, highlighting the need to differentiate an acute from a chronic or acute-on-chronic phenomenon when interpreting the clinical outcomes.

The complication profile revealed that the most common complication was acute peripancreatic fluid collection with a 20.0% incidence, followed by acute kidney injury with a 12.0% incidence. Eighty percent of patients (8.0%) had acute necrotic collections and 80 patients (8.0%) had respiratory failure. Sixty percent had a persistent organ failure and 4.0% had infected pancreatic necrosis. The results in this study show that there can be organ dysfunction in addition to local changes in the pancreas during acute pancreatitis. Renal impairment is especially significant as it can be associated with a serious systemic infection and may make clinical management more difficult [16].

The clinical profile and natural course of patients with hypertriglyceridemia and pancreatitis was examined by Vipperla et al. [17] and is therefore of relevance to the metabolic subgroup found in the present study. However, the current findings are not definitive for association with complication as complication rates have not been cross-tabulated by etiology. In the same manner, the research by Selvanathan et al. [18] on the study of acute kidney injury in severe acute pancreatitis brings the clinical relevance of renal dysfunction and mortality assessment to the fore in this population. The complications seen are therefore supportive of the significance of monitoring organ function and recognizing patients that may benefit from more aggressive supportive treatment.

The clinical outcomes revealed that 92.0% of patients were discharged after clinical improvement and 8.0% of patients died while in hospital. 12.0% of patients required admission to an intensive care unit (ICU) and 8.0% were treated with an interventional procedure. The results suggest a good outcome of the discharge of the majority of patients, but a small number had a more complex hospital stay. A high proportion of discharged cases and a high in-hospital mortality rate highlight the variable clinical course in acute pancreatitis. Alam et al. [19] studied the clinicopathological profile and immediate hospital outcome of patients with acute pancreatitis, which makes their study relevant for interpretation of the short term outcome among the patients presented in the present study.

Reid et al. [20] studied the epidemiology, etiology and outcomes of acute pancreatitis in a tertiary hospital in Jamaica, highlighting the need to assess these factors in different healthcare settings. Variations in case mix, disease severity, referral patterns and availability of treatment resources may affect reported outcomes and should be taken into account when comparing studies. None of the current results would be sufficient to draw conclusions about the factors involved in mortality, and more detailed severity, organ failure, etiology and outcome analyses would be needed to see what prognostic associations could be established.

In general, the present study confirms that the most common etiological groups were alcohol-associated and gallstone associated pancreatitis, abdominal pain was the most common presenting symptom, and mild disease was the largest severity group. However, local complications, renal dysfunction, respiratory failure, intensive care and in-hospital deaths suggest that acute pancreatitis is a clinically relevant disease that needs prompt evaluation and intervention. The results emphasize the need to understand the underlying cause, look at the severity of the disease based on standard criteria, and track patients for progressive organ dysfunction.

The findings of this study are applicable to the specific tertiary care centre and the specific one-year time frame studied and may not be applicable in all healthcare settings. In addition, any comparison with other studies should take into consideration the

differences in study design and patient populations. Using verified patient-level data and appropriate statistical comparisons in future analysis should help clarify the relationship between etiological factors, disease severity, complications and clinical outcomes.

Conclusion

In the present study, alcohol-associated and gallstone-related pancreatitis were emphasized as the main causes of pancreatitis in 150 patients examined. Most clinical presentation was upper abdominal pain and the majority of the cases were mild acute pancreatitis. While most of the patients were discharged when clinical improvement was evident, intensive care unit need and in-hospital death rates in addition to complications like peripancreatic fluid collection and acute kidney injury reflect potential severity of the disease. These results highlight the significance of early diagnosis, identification of the underlying cause, uniform severity grading of the disease and prompt treatment of complications. Individualised treatment and appropriate monitoring may help to optimize clinical outcomes in acute pancreatitis patients.

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