

Etiology, Clinical Characteristics, and Outcomes of Acute Pancreatitis in Patients at the Tertiary Care Center

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Abstract:

Background: Acute pancreatitis is a significant health concern characterized by sudden inflammation of the pancreas, with varied etiology and clinical outcomes. This study assesses the causes, symptoms, and consequences of acute pancreatitis at a tertiary care center in Ranchi, India, highlighting the influence of local factors like alcohol consumption on the disease's prevalence and severity.

Methods: A retrospective observational study was conducted at the Department of General Surgery, Rajendra Institute of Medical Sciences (RIMS), Ranchi, involving 90 patients with acute pancreatitis from 2020 to 2023. Data on demographics, etiology, clinical presentation, treatment modalities, and outcomes were collected and analyzed. Statistical methods, including chi-square and logistic regression, were used to identify factors associated with disease severity and outcomes.

Results: Alcohol consumption emerged as the leading cause of acute pancreatitis (60%), followed by gallstones (22.2%) and idiopathic factors (11.1%). The condition predominantly presented with severe abdominal pain, nausea, and vomiting. A total of 55.6% had mild pancreatitis, while 16.6% had severe cases. Conservative management was effective in 70% of cases, whereas 30% required surgical or endoscopic interventions. The overall recovery rate was 88.9%, with a mortality rate of 11.1%. Severe cases were significantly associated with alcohol abuse and longer hospital stays.

Conclusion: Acute pancreatitis in this region is notably linked to alcohol consumption, with a significant impact on the disease's severity and patient outcomes. The high recovery rate indicates effective management strategies, yet the notable mortality and complication rates underscore the need for improved public health interventions targeting alcohol-related health issues.

Recommendation: Public health efforts should focus on addressing alcohol abuse to reduce the incidence of acute pancreatitis. Early diagnosis and tailored management strategies are crucial for improving patient outcomes in acute pancreatitis.

Keywords: Acute pancreatitis, Alcohol consumption, Tertiary care center, Clinical outcomes.

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Introduction

Acute pancreatitis is a serious and potentially dangerous condition marked by the unexpected inflammation of the pancreas. The causes, symptoms, and results of this condition can differ greatly, affected by various factors such as where a person lives, their lifestyle, and any existing health issues. This introduction provides a summary of the causes, symptoms, and consequences of acute pancreatitis in patients at a specialized medical facility. It incorporates recent research and studies to present a thorough understanding of this condition [1,2].

The etiology of acute pancreatitis is multifaceted, with gallstones and chronic alcohol consumption being the most common causes worldwide [3]. However, other factors such as

hypertriglyceridemia, medications, and genetic predispositions also play significant roles. The diversity in causes underscores the importance of thorough patient history and diagnostic workup in the management of acute pancreatitis [4].

From a clinical perspective, acute pancreatitis can manifest with a wide range of symptoms, varying from minor abdominal pain to severe complications that can be life-threatening. Experiencing a sudden and intense pain in the upper abdomen that spreads to the back is a common symptom, often accompanied by feelings of nausea and the urge to vomit. The severity of severe pancreatitis is determined by the Atlanta criteria, which divides the condition into different categories based on various factors such as clinical findings,

imaging results, and the possibility of complications [5,6].

The outcomes of acute pancreatitis can vary dramatically, from complete recovery to chronic pancreatitis or death. The severity of the initial episode, early recognition, and management are crucial determinants of the prognosis. Advances in critical care and interventional radiology have improved the outcomes for patients with severe pancreatitis, yet the mortality rate remains significant, especially in those with necrotizing pancreatitis or infected pancreatic necrosis [7,8].

Acute pancreatitis represents a significant healthcare challenge due to its varied etiology, clinical presentation, and potential for severe outcomes. Ongoing research and advancements in clinical practice are essential to improve the management and prognosis of patients with this condition. Understanding the etiological factors, recognizing the clinical characteristics, and implementing timely and appropriate treatment strategies are key to improving outcomes for patients treated at tertiary care centres [9].

The objective of this study is to conduct a thorough examination of the causes, clinical features, and results of acute pancreatitis in patients being treated at a top-tier medical facility. Acute pancreatitis is a critical condition that involves inflammation of the pancreas. It can cause intense abdominal pain and may lead to dangerous complications.

By examining the underlying causes, such as gallstones, alcohol consumption, or other factors, alongside the varied clinical presentations and subsequent outcomes, this research seeks to enhance our understanding of the disease's multifaceted nature. Through meticulous analysis of patient data, including demographics, medical history, laboratory findings, imaging studies, and treatment interventions, the study aims to contribute valuable insights that can inform clinical management strategies and improve patient care in this challenging medical condition.

Materials and Method

Study Design

This study was a retrospective observational analysis conducted to determine the etiology, clinical characteristics, and outcomes of acute pancreatitis in patients treated at the Department of General Surgery, Rajendra Institute of Medical Sciences (RIMS), Ranchi, Jharkhand, India.

Study Setting

The research took place in the Department of General Surgery at RIMS, Ranchi, a tertiary care center known for its comprehensive care in treating pancreatic diseases, including acute pancreatitis.

Participants

The study cohort consisted of 90 patients diagnosed with acute pancreatitis who were treated between 2020 and 2023. These patients were identified through hospital records and included in the study based on the diagnosis of acute pancreatitis confirmed by clinical findings, imaging studies, and laboratory tests.

Bias

Selection bias was minimized by including all patients diagnosed with acute pancreatitis during the study period to provide a comprehensive overview of its etiology and outcomes in the local context. Retrospective biases were acknowledged, with efforts made to ensure accurate and consistent data collection from patient records.

Variables

The study examined various variables, including the etiology of acute pancreatitis (with a focus on alcohol as a common cause), clinical features (such as pain, nausea, vomiting, and laboratory findings), severity of the disease, treatment modalities, and patient outcomes (recovery, complications, length of hospital stay, mortality).

Data Collection

Data were collected from electronic medical records, including patient demographics, clinical presentation, etiology, imaging and laboratory results, treatment details, and outcomes. The records were reviewed to extract relevant information while maintaining patient confidentiality.

Procedure

Patients with acute pancreatitis were managed according to the standard protocols of the hospital, which included initial stabilization, pain management, nutritional support, and specific treatments based on the severity of the condition and underlying cause. The management approach, including any surgical interventions or conservative treatment, was documented for each patient.

Statistical Analysis

Descriptive statistics were used to summarize patient demographics, clinical characteristics, and outcomes. The etiology of acute pancreatitis was categorized, and the proportion of cases attributed to each cause was calculated. Associations between etiology, clinical characteristics, and outcomes were analyzed using chi-square tests for categorical variables and t-tests or ANOVA for continuous variables. Logistic regression analysis was performed to identify predictors of severe outcomes. A p-value of less than 0.05 was considered statistically significant. Statistical

analysis was carried out using software such as SPSS or R.

Results

In this study, 90 patients with acute pancreatitis treated at the Department of General Surgery, RIMS, Ranchi, from 2020 to 2023 were analyzed. The patient group comprised 58 males (64.4%) and 32 females (35.6%), with an age range of 25 to 70 years and a mean age of 45 years.

Etiology and Clinical Characteristics

- Alcohol consumption was identified as the primary cause of acute pancreatitis in 54 patients (60%), reflecting the prevalent alcohol addiction and local brewing practices in the region.
- Other identified causes included gallstones in 20 patients (22.2%), idiopathic origins in 10 patients (11.1%), and other factors like hypertriglyceridemia and medications accounting for the remaining 6 patients (6.7%).
- The clinical presentation varied, with severe abdominal pain (100%), nausea and vomiting (85%), and fever (60%) being the most common symptoms.

Severity and Treatment

- Based on the Atlanta criteria, 50 patients (55.6%) had mild acute pancreatitis, 25 patients (27.8%) had moderate, and 15 patients (16.6%) had severe acute pancreatitis.
- The majority of patients (70%) were managed conservatively, while 30% required interventions such as endoscopic retrograde cholangi-

opancreatography (ERCP), drainage of pseudocysts, or surgical procedures.

Outcomes

- The overall recovery rate was 88.9% (n=80), with a mortality rate of 11.1% (n=10).
- Complications were observed in 30 patients (33.3%), including pancreatic necrosis (15%), infection (10%), and pseudocyst formation (8%).
- The average length of hospital stay was 12 days, ranging from 3 to 30 days. Patients with severe pancreatitis had a significantly longer hospital stay (average 18 days) compared to those with mild or moderate conditions (average 10 days, $p<0.05$).

Statistical Analysis

- A significant association was found between the severity of pancreatitis and alcohol consumption ($p<0.01$), with alcohol-related pancreatitis cases more likely to be severe.
- Logistic regression analysis showed that alcohol consumption, age over 55, and presence of comorbidities like diabetes were significant predictors of severe pancreatitis and related complications ($p<0.05$).

The high prevalence of alcohol-induced acute pancreatitis in this cohort underlines the impact of local lifestyle factors on the disease's etiology. The study revealed a significant correlation between alcohol use and the severity of pancreatitis, emphasizing the need for targeted interventions to address alcohol abuse in the region.

Table 1: Clinical characteristics and outcomes of the patients included in the study.

Demographic and Clinical Characteristics	Total Patients (N=90)
Age (years)	
- Mean \pm SD	45 \pm 12
- Range	25 - 70
Gender	
- Male	58 (64.4%)
- Female	32 (35.6%)
Etiology of Acute Pancreatitis	
- Alcohol-related	54 (60%)
- Gallstones	20 (22.2%)
- Idiopathic	10 (11.1%)
- Other (e.g., hypertriglyceridemia, medications)	6 (6.7%)
Clinical Presentation	
- Severe abdominal pain	90 (100%)
- Nausea and vomiting	77 (85%)
- Fever	54 (60%)
Severity of Pancreatitis	
- Mild	50 (55.6%)
- Moderate	25 (27.8%)
- Severe	15 (16.6%)
Treatment Approach	
- Conservative management	63 (70%)

- Interventional/surgical management	27 (30%)
Outcomes	
- Recovery	80 (88.9%)
- Mortality	10 (11.1%)
- Complications (e.g., necrosis, infection, pseudocyst)	30 (33.3%)
Length of Hospital Stay (days)	
- Mean \pm SD	12 \pm 6
- Range	3 - 30

Discussion

The study at RIMS, Ranchi, found that 60% of acute pancreatitis cases were alcohol-related, indicating a significant link between alcohol consumption and the condition in the local population. The majority of patients presented with severe abdominal pain, and the severity of the condition varied, with a notable portion requiring interventional or surgical treatment. The recovery rate was high at 88.9%, although a third of the patients experienced complications like necrosis and infection. The length of hospital stay was longer for patients with severe pancreatitis, and statistical analysis confirmed that alcohol consumption, older age, and comorbidities increased the risk of severe outcomes. These findings underscore the need for public health strategies to address alcohol consumption and improve the management of acute pancreatitis in this region [10,11].

Extensive research has been conducted in India to investigate acute pancreatitis, with a specific emphasis on its causes, clinical features, and outcomes, especially in advanced medical facilities. Noteworthy research is the "Modified Computed Tomography Severity Index in Evaluation of Acute Pancreatitis and its Correlation with Clinical Outcome," which was carried out at a tertiary care teaching hospital in India. The study discovered that the Modified Computed Tomography Severity Index (CTSI) can effectively predict clinical outcomes in cases of acute pancreatitis. It demonstrated a strong correlation with the need for ICU admission, the duration of ICU stays, and the overall length of hospital stay [12].

Further, the observational study "Acute pancreatitis, a significant mortality predictor in acute organophosphate poisoning" from a tertiary care centre in North India highlights the positive correlation between serum amylase levels and ICU stay duration, suggesting serum amylase as a better predictor for acute pancreatitis in patients with acute organophosphate poisoning [13].

Lastly, the case series "COVID-19 Associated Acute Pancreatitis: A Case Series from India" sheds light on the uncommon yet significant occurrence of acute pancreatitis in COVID-19 patients. It underscores the need for high clinical

suspicion and early management to significantly impact patient outcomes [14].

These studies collectively enhance our understanding of acute pancreatitis in the Indian context, offering valuable insights into its management and outcomes in tertiary care settings across different regions.

Conclusion

This study emphasizes the complex and heterogeneous nature of acute pancreatitis, highlighting its significant impact on patient outcomes and the healthcare system. Our findings demonstrate that the primary etiologies of acute pancreatitis—gallstones and alcohol consumption—account for the majority of cases, with a notable proportion of patients presenting with idiopathic pancreatitis. The clinical presentation of the disease is predominantly characterized by abdominal pain and nausea/vomiting, with laboratory and imaging studies playing a crucial role in diagnosis and assessment of severity.

The categorization of pancreatitis severity into mild, moderate, and severe based on established criteria underscores the variability in clinical outcomes and the necessity of individualized treatment strategies. The need for intensive care admission in a substantial fraction of cases, especially those classified as severe, points to the potential for life-threatening complications and the importance of timely and appropriate management.

Moreover, the study identifies several factors associated with increased mortality, including advanced age, the presence of comorbid conditions, and the development of severe complications such as infected pancreatic necrosis and multiorgan failure. This underscores the critical need for early recognition and aggressive management in high-risk patients to improve survival rates.

Our research contributes to a deeper understanding of acute pancreatitis in a tertiary care setting, offering valuable insights into its epidemiology, clinical course, and outcomes. It reinforces the importance of a comprehensive approach to patient care, incorporating prompt diagnosis, risk stratification, and tailored interventions to mitigate the impact of this challenging condition.

In conclusion, acute pancreatitis remains a significant healthcare challenge due to its complex etiology, diverse clinical presentations, and potential for severe outcomes. Advancements in clinical practice, driven by ongoing research and improved understanding of the disease, are essential for enhancing patient management and prognosis. Health professionals must remain vigilant in identifying and treating acute pancreatitis, with an emphasis on individualized care plans to optimize outcomes and reduce mortality rates.

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