

Clinical profile, severity, and outcomes of acute pancreatitis among patients visiting a tertiary care center in Eastern Nepal

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ABSTRACT

Introduction: Acute pancreatitis (AP) is a common gastrointestinal emergency with variable clinical presentation and outcomes. Severity indices such as the Modified CT Severity Index are important tools for predicting complications and outcomes.

Objective: To evaluate the clinical profile, severity and outcomes of patients with acute pancreatitis at a tertiary care center in Eastern Nepal.

Methodology: A descriptive cross-sectional study was conducted at Nobel Medical College Teaching Hospital, Biratnagar over a period of one year among 90 patients using consecutive sampling. Patients aged ≥ 18 years fulfilling at least two of these criteria: typical abdominal pain, ≥ 3 times elevated serum amylase/lipase, or imaging features of acute pancreatitis were included. Data were analyzed using IBM SPSS Statistics for Windows version 25 with descriptive statistics to summarise baseline characteristics and chi-square or Fisher's exact tests to see the associations between disease severity and outcomes.

Results: The mean age of patient was 44.8 ± 15.9 years, with a male predominance 51 (57%). Alcohol 39 (43%) and gallstones 30 (33%) were the leading causes. Based on the Modified CT Severity Index, 13 (20%) of cases were mild, 38 (58%) moderate, and 15 (23%) severe. Complications occurred in 42 (47%) of patients more than half those were peripancreatic fluid collection. Overall mortality was 5 (6%), all within the severe group. Disease severity showed a significant association with mortality ($p < 0.001$).

Conclusion: Acute pancreatitis in Eastern Nepal predominantly affects middle-aged males. A substantial proportion present with moderate-to-severe disease and notable mortality, underscoring the need for early severity assessment and improved critical care facilities.

Keywords: Acute pancreatitis; Critical Care; Disease severity; Eastern Nepal; Outcomes; Modified CT Severity Index.

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INTRODUCTION

Acute pancreatitis (AP) is an inflammatory condition of the pancreas that ranges from mild abdominal pain to severe, life-threatening complications. Its global incidence is increasing, influenced by diet, alcohol use, biliary diseases, and healthcare access¹. In Nepal, especially the eastern region, limited data exist on the clinical profile and outcomes of AP. Studies from other parts of Nepal have identified gallstones and alcohol abuse as major causes, with many patients presenting late to tertiary centers². In-hospital outcomes—such

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as complications, systemic inflammatory response syndrome (SIRS), organ failure, and mortality—are closely linked to disease severity, treatment timing, and comorbidities³. A study from Gandaki Province reported severe complications in 15% of patients and mortality up to 6%⁴. However, similar data from Eastern Nepal remain scarce, though differences in population, diet, and healthcare access may influence outcomes⁵. Despite research, overall mortality has not significantly improved, emphasizing the importance of early diagnosis and severity prediction⁶⁻⁷. Patients with severe acute pancreatitis (SAP) are often identified late, when the inflammatory cascade is difficult to reverse⁷. This study aims to evaluate the clinical profile, severity indices, and in-hospital outcomes of patients with acute pancreatitis to identify factors associated with disease severity and mortality

METHODOLOGY

A descriptive cross-sectional study was conducted among patients diagnosed with acute pancreatitis at Nobel Medical College and Teaching Hospital, Biratnagar, Nepal, over a one-year period from August 2024 to July 2025. The study aimed to evaluate the clinical profile and in-hospital outcomes of patients diagnosed with acute pancreatitis attending a teaching hospital. Ethical clearance was obtained from the Institutional Review Committee of Nobel Medical College (IRC No: 125/2024)

All patients aged 18 years and above who fulfilled at least two of the following criteria were included: characteristic upper abdominal pain, serum amylase or lipase levels ≥ 3 times the upper normal limit, or imaging findings consistent with acute pancreatitis (ultrasound or CT). Patients with chronic pancreatitis, pancreatic malignancy, incomplete medical records, or those discharged or referred within 24 hours of admission were excluded.

The required sample size was calculated using the formula $n = Z\alpha^2 p(1-p)/d^2$, with a prevalence (p) of 5.6%, 95% confidence level ($Z\alpha = 1.96$), and margin of error (d) of 5%. The minimum sample size obtained was 82, which was increased to 90 after adding 10% for non-response.

Consecutive patients meeting the inclusion criteria during the study period were enrolled. Data were collected prospectively from hospital records using a structured proforma, including demographic details, clinical presentation, laboratory and imaging findings, severity grading based on the Modified CT Severity Index (MCTSI), complications, treatment, hospital stay, ICU admission, and mortality.

The data were systematically coded, entered into Microsoft Excel and analysed using the statistical package for social sciences, IBM SPSS Statistics for Windows version 25 (IBM Corp., Armonk, N.Y., USA). Descriptive statistics (frequencies, percentages, means, and standard deviations) were calculated. Associations between clinical variables and outcomes were assessed using chi-square or Fisher's exact tests, with $p < 0.05$ considered statistically significant.

RESULTS

A total of 90 patients were included in the study, comprising 51 (56.7%) males and 39 (43.3%) females, with a male-to-female ratio of 1.3:1. The mean age was 44.8 ± 15.9 years, ranging from 18 to 80 years (Table 1). Alcohol was the most common etiological factor, observed in 39 (43.3%) cases, followed by gallstones in 30 (33.3%, Table 2). Smokers constituted 24 (26.7%), while 49 (54.4%) reported alcohol use. Co-morbidities were present in 33 (36.7%) cases (Table 3). Pain abdomen was the most common presenting symptom 67 (74.4%), followed by vomiting 47 (52.2%). Raised serum amylase and lipase ($>3 \times$ ULN) were seen in 87 (96.7%) and 79 (87.8%), respectively. Leukocytosis was noted in 59 (65.6%), and pleural effusion in 49 (54.4%). Acute kidney injury (AKI) was seen in 7 (7.8%) patients (Table 4). A total of 90 patients were analyzed to assess the association between CRP level and outcome. Among them, 22 (24.4%) had normal CRP and 68 (75.6%) had raised CRP levels. Mortality occurred in 2 patients (9.1%) with normal CRP and in 3 patients (4.4%) with raised CRP. Although the proportion of mortality was higher among patients with normal CRP, this difference was not statistically significant (no significant association was observed, $p > 0.05$). Hence, no significant association was found between CRP level and patient outcome in the present study. Ultrasonography revealed a normal pancreas in 35 (38.9%) patients, gallstones in 18 (20%), and features of pancreatitis in 31 (34.4%). CT findings confirmed pancreatitis in 84 (93.3%) cases (Table 5). Complications were observed in 42 (46.7%) patients. Among local complications, acute peripancreatic fluid collection (APFC) was the most common 22 (52.4%), followed by acute necrotic collection (35.7%) Systemic complications included ascites, pleural effusion, splenic vein thrombosis, and pancreatic ascites (Table 6). Based on the Modified CT Severity Index (MCTSI), 13 (19.7%) had mild, 38 (57.6%) moderate, and 15 (22.7%) severe pancreatitis. ICU admission was required in 12 (13.3%) patients, with a mean ICU stay of 6.8 days and mean hospital stay of 9.4 days. Overall Mortality occurred in 5 (5.6%) patients. A cross-tabulation analysis was

performed to assess the association between the severity of acute conditions, as classified by the MCTSI (Mild, Moderate, Severe), and patient outcome (Mortality vs. Discharged). The results revealed a statistically significant association between MCTSI group and clinical outcome (p value < .001) with a clear mortality gradient across the severity groups accounting for all five (33%) recorded deaths from (Table 7).

Among 90 patients studied, 59 (65.6%) had Bedside Index for Severity in Acute Pancreatitis (BISAP) < 2, and 31 (34.4%) had BISAP ≥ 2. Mortality occurred in one patient (1.7%) with BISAP < 2 and in four patients (12.9%) with BISAP ≥ 2. The difference in outcome between the two groups was statistically significant (p value = 0.046). Thus, patients with a raised BISAP score (≥2) were found to have a significantly higher risk of mortality compared to those with lower scores.

A statistically significant association with mortality was observed for pancreatic necrosis (p value = 0.041), pulmonary complication (p value = 0.004), cardiovascular complication (p value = 0.035), and acute kidney injury (p value = 0.010, Table 8)

Table 1: Demographic profile of the patients with acute pancreatitis.

| Variable | Category | n (%) |
|-------------------|----------|-----------|
| Sex | Male | 51 (56.7) |
| | Female | 39 (43.3) |
| Age group (years) | ≤ 40 | 40 (44.4) |
| | 41–60 | 29 (32.2) |
| | >60 | 21 (23.3) |

Table 2: Etiology of acute pancreatitis.

| Etiology | n (%) |
|--------------------------------|-----------|
| Alcohol | 39 (43.3) |
| Gallstone | 30 (33.3) |
| Hypertriglyceridemia | 6 (6.7) |
| Alcohol + Gallstone | 2 (2.2) |
| Alcohol + Hypertriglyceridemia | 2 (2.2) |
| Cause not identified | 11 (12.2) |

Table 3: Risk factors and co-morbidities among patients with acute pancreatitis.

| Variable | n (%) |
|-----------------------------|-----------|
| Smoking | 24 (26.7) |
| Alcohol use | 49 (54.4) |
| Pre-existing co-morbidities | 33 (36.7) |

Table 4: Clinical and laboratory findings among patients with acute pancreatitis.

| Variable | n (%) |
|--------------------------|-----------|
| Pain abdomen | 67 (74.4) |
| Vomiting | 47 (52.2) |
| Fever | 9 (10.0) |
| Jaundice | 5 (5.6) |
| Obstipation | 4 (4.4) |
| Abdominal distension | 1 (1.1) |
| Raised amylase (>3× ULN) | 87 (96.7) |
| Raised lipase (>3× ULN) | 79 (87.8) |
| Leukocytosis | 59 (65.6) |
| Pleural effusion | 49 (54.4) |
| Acute kidney injury | 7 (7.8) |

Table 5: Radiological findings among patients with acute pancreatitis.

| Findings | n (%) |
|--------------------------|-----------|
| Normal pancreas | 35 (38.9) |
| Gallstone only | 18 (20.0) |
| Features of pancreatitis | 31 (34.4) |
| Gallstone + pancreatitis | 6 (6.7) |

Table 6: Different complications among patients

| Complication | n (%) |
|-----------------------------|-----------|
| APFC | 22 (52.4) |
| ANC | 15 (35.7) |
| Pseudocyst | 2 (4.8) |
| WON | 3 (7.1) |
| Ascites | 5 (5.6) |
| Ascites + PV thrombosis | 1 (1.1) |
| Left subcapsular abscess | 1 (1.1) |
| Pancreatic ascites | 2 (2.2) |
| Retroperitoneal lymph nodes | 1 (1.1) |
| Splenic vein thrombosis | 3 (3.3) |

Table 7: Severity and Outcome of acute pancreatitis

| MCTSI group | Mortality | Discharged | Total | p-value |
|-------------|-----------|------------|-------|---------|
| Mild | 0 | 13 | 13 | <0.001* |
| Moderate | 0 | 38 | 38 | |
| Severe | 5 | 10 | 15 | |

p-value <0.05 significant *= chi square test

Table 8: Association between complications and outcome of acute pancreatitis.

| Complication | Group | Mortality n (%) | Discharged n (%) | Total | p-value |
|-----------------------------|-------|-----------------|------------------|-------|--------------------|
| Ascites | Yes | 2 (12.5) | 14 (87.5) | 16 | 0.112 |
| Pleural effusion | Yes | 5 (10.2) | 44 (89.8) | 49 | 0.060 |
| Pancreatic necrosis | Yes | 3 (21.4) | 11 (78.6) | 14 | 0.041 [†] |
| Pulmonary complication | Yes | 4 (23.5) | 13 (76.5) | 17 | 0.004 [†] |
| Cardiovascular complication | Yes | 3 (17.6) | 14 (82.4) | 17 | 0.035 [†] |
| Acute kidney injury | Yes | 3 (42.9) | 4 (57.1) | 7 | 0.010 [†] |

p-value <0.05 significant [†]= Fisher's Exact Test

DISCUSSION

This study analyzed the clinical profile, severity indicators, and in-hospital outcomes of patients with acute pancreatitis (AP) at a tertiary care center in Eastern Nepal. The findings highlight a predominance of alcohol- and gallstone-related pancreatitis, with a considerable proportion of patients presenting with moderate-to-severe disease and a notable in-hospital mortality rate.

The mean age of 44.8 years in our cohort reflects the younger demographic commonly affected in South Asian populations, consistent with findings from Nepal and India.⁷⁻⁸ Male predominance (56.7%) and alcohol as the leading etiology (43.3%) followed by gallstones (33.3%) are in line with other regional studies, where alcohol abuse has emerged as a major risk factor.²⁻⁴ In contrast, Western studies continue to report biliary pancreatitis as the most frequent cause, emphasizing regional differences in lifestyle and dietary patterns.¹ Preventive strategies and public health implications for acute pancreatitis primarily focus on lifestyle modifications and targeted interventions to manage its primary causes: gallstones and alcohol abuse. Abstinence from alcohol is a critical prevention strategy, especially after a first episode of alcoholic pancreatitis, to slow disease progression and reduce the risk of recurrence. Public health initiatives like brief alcohol cessation interventions during hospital admissions, combined with follow-up support, have shown promise in improving sobriety and outcomes.¹²

According to the Modified CT Severity Index (MCTSI), 80.3% of patients had moderate-to-severe disease, which is higher than the 15–25% typically reported in other studies.¹³ The significant correlation between severity and mortality ($p < 0.001$) confirms previous observations that severe disease carries a markedly worse prognosis.¹⁴ All five deaths (5.6%) in our study occurred among patients with severe pancreatitis, echoing results from Bhattarai & Gyawali⁴ and the revised Atlanta classification criteria, which link persistent organ failure with high mortality.¹⁵

Complications were noted in nearly half of the patients (46.7%), with local complications such as acute peripancreatic fluid collection (52.4%) and necrosis (35.7%) being most common. Systemic complications including pulmonary, cardiovascular, and renal involvement showed strong associations with mortality, particularly acute kidney injury ($p = 0.010$) and pulmonary complications ($p = 0.004$). This aligns with Garg et al., who described organ failure as a major predictor of death in severe pancreatitis.¹⁶

The Bedside Index for Severity in Acute Pancreatitis (BISAP) score is a simple bedside tool used for early risk prediction. In our study, patients with BISAP ≥ 2 had significantly higher mortality (12.9%) compared to those with BISAP < 2 (1.7%) ($p = 0.046$). This finding is consistent with multiple international studies validating the BISAP score as an accurate predictor of early mortality and complications.¹⁷⁻¹⁸ Wu et al. demonstrated that a BISAP score ≥ 3 was strongly associated with increased mortality risk, supporting its prognostic utility in resource-limited settings.¹⁷

Although C-reactive protein (CRP) is widely used as a marker of inflammation and disease severity, our study found no significant association between CRP levels and patient outcomes ($p > 0.05$). While this may seem contrary to some reports where CRP > 150 mg/L at 48 hours predicts severe disease,¹⁹ variations in timing of CRP measurement and the predominance of late-presenting patients in our cohort may explain the discrepancy. Similar findings have been observed in studies where CRP failed to distinguish survivors from non-survivors in smaller samples.²⁰ Our findings reinforce the need for early risk stratification using simple and reliable scoring systems such as BISAP, especially in low-resource hospitals where CT imaging and intensive monitoring are limited. Moreover, the strong association between systemic complications and mortality highlights the importance of aggressive supportive management and

early ICU referral in patients with organ dysfunction. This was a single-center study with a relatively small sample size, which may not reflect the wider population of Nepal. As data were collected only from hospitalized patients, milder cases in the community might have been missed. Some investigations were not consistently available for all participants, and the study focused only on in-hospital outcomes without follow-up after discharge.

CONCLUSION

The present study underscores a high burden of moderate-to-severe acute pancreatitis in Eastern Nepal,

predominantly associated with alcohol and gallstones. Both BISAP score and CT-based severity grading proved valuable for predicting adverse outcomes, whereas CRP showed limited prognostic value. Strengthening early diagnosis, timely referral, and critical care resources could substantially reduce mortality in this setting.

Conflict of Interest: None

Source (s) of Support: None

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