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Original Research Article

Management and outcome of acute pancreatitis: a prospective observational study of 30 cases at a tertiary care hospital in Western India

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ABSTRACT

Background: Acute pancreatitis ranges from a mild, self-limiting illness to severe disease with organ failure. Regional data on its etiology, severity, management and outcome help plan care in Indian tertiary hospitals.
Methods: This prospective observational study included 30 patients with acute pancreatitis admitted to the department of general surgery of a tertiary care hospital in Jamnagar over 12 months. Profile, etiology, imaging, Ranson, BISAP and APACHE II scores, management, complications and outcome were recorded, and correlation between the scores was analyzed.
Results: All patients were men (mean age 42.13±12.56 years). Gallstones (40.00%) and alcohol (36.67%) were the leading causes, and 60.00% smoked. Abdominal pain was universal and jaundice present in 76.67%. Pseudocyst (43.33%) and necrosis (20.00%) were common on imaging. Ranson scoring classified 63.33% as severe or very severe, BISAP placed 23.33% at high risk and APACHE II classified 56.67% as severe or very severe. Only Ranson and APACHE II correlated significantly (r=0.37, p=0.04). Management was mainly conservative; antibiotics were given to 90.00% and enteral or parenteral nutrition to 60.00%. Shock (40.00%), acute kidney injury (33.33%) and sepsis (23.33%) were the main systemic complications. Mean hospital stay was 6.17±3.50 days. Twelve patients (40.00%) were discharged, 15 (50.00%) referred and three (10.00%) died; 36.67% were readmitted.
Conclusions: Acute pancreatitis affected young and middle-aged men, mainly from gallstones and alcohol, and most had moderate to severe disease. Early severity scoring, judicious antibiotic use and access to step-up intervention are needed to reduce referral and mortality.

Keywords: Acute pancreatitis, APACHE II, BISAP, Gallstones, Outcome, Ranson score

INTRODUCTION

Acute pancreatitis is one of the most common gastrointestinal causes of hospital admission, and its global incidence has risen steadily over the past five decades.[1,2] Gallstones and alcohol remain the two dominant causes worldwide, with hypertriglyceridemia, trauma, drugs and idiopathic disease accounting for most of the remainder.[3,4] Although most episodes are mild and resolve with supportive care, about one fifth of patients develop moderately severe or severe disease with pancreatic necrosis, persistent organ failure and a substantial risk of death.[5,6]

The revised Atlanta classification defines the diagnosis of acute pancreatitis and grades its severity according to organ failure and local or systemic complications.[7] Early prediction of a severe course is the basis of triage, and several scores are used for this purpose, including the Ranson criteria, the bedside index of severity in acute pancreatitis (BISAP) and the acute physiology and chronic health evaluation II (APACHE II) score.[8-10]

These scores differ in timing, components and complexity, and their agreement in routine practice varies between populations.[11,12]

Management has shifted towards goal-directed fluid resuscitation, early enteral feeding, avoidance of prophylactic antibiotics and a minimally invasive step-up approach to infected necrosis.[13-16] The application of these principles depends on local resources, and the pattern of etiology, severity and outcome differs across Indian regions.[17-19] This study evaluated the clinical profile, severity scoring, management and outcome of patients with acute pancreatitis admitted to a tertiary care teaching hospital in Gujarat, western India.

METHODS

Study design and setting

This prospective observational study was conducted in the department of general surgery, Shri M. P. Shah Government Medical College and Guru Gobind Singh Government Hospital, Jamnagar, Gujarat, India, over 12 months from August 2025 to July 2026. The hospital is a tertiary care teaching institution serving urban and rural populations of the Saurashtra region.

Participants

Consecutive adults (18 years or older) admitted with acute pancreatitis were enrolled after written informed consent until a sample of 30 was reached. The diagnosis was based on the revised Atlanta classification and required at least two of the following: typical acute upper abdominal pain, serum amylase or lipase more than three times the upper limit of normal, and characteristic findings on ultrasonography or contrast-enhanced computed tomography.[7] Patients with chronic pancreatitis, pancreatic malignancy, pregnancy, incomplete records or unwillingness to participate were excluded.

Data collection

A structured case record form was used to record age, sex, occupation, smoking, obesity, diabetes mellitus, etiology, presenting symptoms and signs, hematological and biochemical investigations including serum amylase and lipase, arterial blood gas analysis, and findings on ultrasonography and contrast-enhanced computed tomography of the abdomen.

Severity assessment

The Ranson score was calculated at admission and at 48 hours.[8] The BISAP score was calculated within 24 hours of admission.[9] The APACHE II score was calculated from the acute physiology, age and chronic health components.[10] Ranson scores were categorized as mild (0-2), moderate (3-4), severe (5-6) or very severe (7 or more), and BISAP scores as low risk (0-1), moderate risk (2) or high risk (3 or more). APACHE II scores were grouped into moderate, severe and very severe categories according to the study proforma. The correlation between the three scores was examined.

Management

All patients received supportive treatment according to institutional protocols based on current guidelines.[13,14] This included resuscitation with isotonic crystalloids (preferably Ringer's lactate) guided by heart rate, blood pressure, urine output, hematocrit and blood urea nitrogen; analgesia with paracetamol, tramadol or opioids; correction of electrolyte and glucose abnormalities; and oxygen or ventilatory support as required. Oral feeding was resumed once pain, nausea and ileus settled. Patients with moderately severe or severe disease received early enteral feeding by nasogastric or nasojejunal tube, and parenteral nutrition was reserved for enteral intolerance. Prophylactic antibiotics were not used routinely; antibiotics were given for suspected or confirmed infected necrosis, cholangitis, pneumonia, urinary or bloodstream infection, or sepsis, guided by culture where available. Endoscopic retrograde cholangiopancreatography was considered for cholangitis or persistent biliary obstruction, and percutaneous, endoscopic or surgical drainage followed a step-up approach for infected necrosis, symptomatic collections or abdominal compartment syndrome. Patients with persistent organ failure were managed in the intensive care unit.

Outcomes

Outcomes were the principal local complication (pancreatic necrosis, pseudocyst or organ failure), the principal systemic complication (shock, acute kidney injury, acute respiratory distress syndrome, sepsis), duration of hospital stay, readmission, and final outcome as discharge, referral to a higher center or death. Patients were followed until discharge, referral or death.

Statistical analysis

Data were entered in Microsoft Excel and analyzed with SPSS version 26.0. Continuous variables were expressed as mean±standard deviation and categorical variables as frequency and percentage. Correlation between the Ranson, BISAP and APACHE II scores was expressed as the correlation coefficient (r). A p value below 0.05 was considered statistically significant.

RESULTS

A total of 30 patients were studied. All were men, with a mean age of 42.13±12.56 years (range 20 to 65 years); the largest group was 30 to 39 years (36.67%). Labourers formed the largest occupational group (40.00%). Eighteen patients (60.00%) were smokers, seven

(23.33%) were obese and eight (26.67%) had diabetes mellitus. Gallstones were the most common cause (40.00%), followed by alcohol (36.67%); hypertriglyceridemia and idiopathic disease accounted for 10.00% each, and one case followed trauma (Table 1).

Table 1: Demographic profile, risk factors and etiology of the study participants (n=30).

Variables	Number of patients (%)
Age group (years)	
20-29	3 (10.00)
30-39	11 (36.67)
40-49	6 (20.00)
50-59	5 (16.67)
60-65	5 (16.67)
Mean±SD (years)	42.13±12.56
Sex	
Male	30 (100.00)
Female	0 (0.00)
Occupation	
Labourer	12 (40.00)
Salaried job	7 (23.33)
Farmer	5 (16.67)
Business	3 (10.00)
Retired	3 (10.00)
Associated factors	
Smoking	18 (60.00)
Diabetes mellitus	8 (26.67)
Obesity	7 (23.33)
Etiology	
Gallstones	12 (40.00)
Alcohol	11 (36.67)
Hypertriglyceridemia	3 (10.00)
Idiopathic	3 (10.00)
Trauma	1 (3.33)

Table 2: Clinical presentation, pancreatic enzymes and imaging findings (n=30).

Variables	N (%)
Symptoms and signs*	
Abdominal pain	30 (100.00)
Nausea and vomiting	24 (80.00)
Jaundice	23 (76.67)
Abdominal tenderness	12 (40.00)
Fever and weakness	10 (33.33)
Breathlessness	8 (26.67)
Pancreatic enzymes (mean±SD)	
Serum amylase (U/l)	482.4±106.9
Serum lipase (U/l)	524.9±16.0
Imaging findings*	
Pseudocyst	13 (43.33)
Parenchymal enlargement	10 (33.33)
Peripancreatic fluid collection	8 (26.67)
Pancreatic necrosis	6 (20.00)

Table 3: Distribution of Ranson and BISAP score components (n=30).

Parameters	Present, N (%)	Absent, N (%)
Ranson criteria at admission		
Age >55 years	6 (20.00)	24 (80.00)
White cell count >16,000/mm^3	14 (46.67)	16 (53.33)
Blood glucose >200 mg/dl	12 (40.00)	18 (60.00)
Lactate dehydrogenase >350 IU/l	12 (40.00)	18 (60.00)
Aspartate aminotransferase >250 IU/l	11 (36.67)	19 (63.33)
Ranson criteria at 48 hours		
Hematocrit fall >10%	12 (40.00)	18 (60.00)
Blood urea nitrogen rise >5 mg/dl	16 (53.33)	14 (46.67)
Serum calcium <8 mg/dl	9 (30.00)	21 (70.00)
Arterial PaO_2 <60 mmHg	19 (63.33)	11 (36.67)
Base deficit >4 mEq/l	15 (50.00)	15 (50.00)
Fluid sequestration >6 l	20 (66.67)	10 (33.33)
BISAP components		
Blood urea nitrogen >25 mg/dl	18 (60.00)	12 (40.00)
Impaired mental status (GCS<15)	11 (36.67)	19 (63.33)
Systemic inflammatory response syndrome	16 (53.33)	14 (46.67)
Pleural effusion	15 (50.00)	15 (50.00)

BISAP: bedside index of severity in acute pancreatitis; GCS: Glasgow coma scale.

Abdominal pain was present in every patient, nausea and vomiting in 80.00% and jaundice in 76.67%. Abdominal tenderness, fever with weakness and breathlessness were recorded in 40.00%, 33.33% and 26.67%, respectively. Mean serum amylase and lipase were 482.4±106.9 U/l and 524.9±16.0 U/l. On imaging, pseudocyst was the most frequent finding (43.33%), followed by parenchymal enlargement (33.33%), peripancreatic fluid collection (26.67%) and necrosis (20.00%) (Table 2).

Among the Ranson admission criteria, leukocytosis above 16,000/mm^3 was most frequent (46.67%). At 48 hours, arterial PaO_2 below 60 mmHg (63.33%), a rise in blood urea nitrogen above 5 mg/dl (53.33%) and base deficit above 4 mEq/l (50.00%) were common. Fluid sequestration above 6 l was recorded in 66.67%. Among BISAP components, blood urea nitrogen above 25 mg/dl (60.00%), systemic inflammatory response syndrome (53.33%) and pleural effusion (50.00%) predominated (Table 3).

Ranson scoring classified 16 patients (53.33%) as severe and three (10.00%) as very severe. BISAP placed 14 (46.67%) in the moderate-risk and seven (23.33%) in the high-risk group. APACHE II classified 13 (43.33%) each as moderate and severe and four (13.33%) as very severe. The Ranson and APACHE II scores showed a weak to moderate positive correlation (r=0.37, p=0.04), whereas BISAP did not correlate with Ranson (r=0.06, p=0.74) or APACHE II (r=-0.03, p=0.89) (Table 4).

Table 4: Severity categories by Ranson, BISAP and APACHE II scores and correlation between the scores (n=30).

Score and category	Number of patients (%)
Ranson score	
Mild (0-2)	2 (6.67)
Moderate (3-4)	9 (30.00)
Severe (5-6)	16 (53.33)
Very severe (7 or more)	3 (10.00)
BISAP score	
Low risk (0-1)	9 (30.00)
Moderate risk (2)	14 (46.67)
High risk (3 or more)	7 (23.33)
APACHE II score	
Moderate	13 (43.33)
Severe	13 (43.33)
Very severe	4 (13.33)
Correlation between scores (r, p value)	
Ranson and BISAP	r=0.06, p=0.74
Ranson and APACHE II	r=0.37, p=0.04
BISAP and APACHE II	r=-0.03, p=0.89

APACHE II: acute physiology and chronic health evaluation II; BISAP: bedside index of severity in acute pancreatitis; r: correlation coefficient. A p value <0.05 was considered significant.

Table 5: Management, complications and outcome (n=30).

Variables	N (%)
Supportive treatment	
Analgesics	25 (83.33)
Antibiotics	27 (90.00)
Route of nutrition	
Oral	12 (40.00)
Enteral	12 (40.00)
Parenteral	6 (20.00)
Principal local complication	
Organ failure	12 (40.00)
Pseudocyst	11 (36.67)
Pancreatic necrosis	7 (23.33)
Principal systemic complication	
Shock	12 (40.00)
Acute kidney injury	10 (33.33)
Sepsis	7 (23.33)
Acute respiratory distress syndrome	1 (3.33)
Hospital stay (days)	
Mean±SD	6.17±3.50
Range	2-16
Final outcome	
Discharged	12 (40.00)
Referred to higher center	15 (50.00)
Death	3 (10.00)
Readmission	
Readmitted	11 (36.67)

One principal local and one principal systemic complication were recorded for each patient. SD: standard deviation.

Analgesics were required by 83.33% of patients and antibiotics were administered to 90.00%. Nutrition was oral in 40.00%, enteral in 40.00% and parenteral in 20.00%. The principal local complication was organ failure in 12 patients (40.00%), pseudocyst in 11 (36.67%) and pancreatic necrosis in seven (23.33%). The principal systemic complication was shock in 40.00%, acute kidney injury in 33.33%, sepsis in 23.33% and acute respiratory distress syndrome in 3.33%. The mean hospital stay was 6.17±3.50 days (range 2 to 16 days). Twelve patients (40.00%) were discharged, 15 (50.00%) were referred to a higher center and three (10.00%) died. Eleven patients (36.67%) were readmitted (Table 5).

DISCUSSION

This prospective series describes acute pancreatitis in a surgical unit of a public tertiary hospital in Gujarat. The disease affected young and middle-aged men, was caused mainly by gallstones and alcohol, and was severe in most patients by Ranson and APACHE II criteria. Half the patients were referred onward and one in ten died.

The age profile matches Indian hospital series, in which acute pancreatitis peaks in economically productive middle age, and is younger than that of Western populations, where incidence rises steadily with age.[3,19] The complete absence of women is striking. In India, alcohol-related pancreatitis occurs predominantly in men, and Pahuja et al. reported a male to female ratio of 2.6:1 in a series where alcohol was the leading cause.[19] Gallstone pancreatitis, however, is common in women, so an all-male sample of 30 is more likely to reflect the referral and admission pattern of a male surgical ward than the true sex distribution of the disease in the region.

Gallstones were the most common cause in this study (40.00%), closely followed by alcohol (36.67%). Indian series vary: alcohol predominates in several north Indian surgical cohorts, whereas a large temporal analysis from Kashmir showed gallstone disease emerging as the leading cause of emergency admissions for pancreatitis.[18,19] Globally, gallstones remain the single largest cause.[3,4] The high proportion of jaundice (76.67%) is consistent with the biliary burden in this sample. Hypertriglyceridemia accounted for 10.00% of cases, a proportion that justifies routine estimation of serum triglycerides at admission, because it changes long-term prevention.[20]

Smoking was recorded in 60.00% of patients. Smoking is an independent, dose-dependent risk factor for acute and recurrent pancreatitis, separate from alcohol.[21] Diabetes (26.67%) and obesity (23.33%) were also frequent. About one fifth of patients with acute pancreatitis have coexisting diabetes, close to the proportion in this study, although diabetes itself has a limited effect on severity.[22] Visceral adiposity, by contrast, predicts severe disease in Indian patients.[23] Both are modifiable and should be addressed at discharge.

Most patients had moderate to severe disease, and pseudocyst and necrosis were frequent on imaging. This is likely to reflect referral bias towards complicated cases and delayed presentation. The three scores did not agree closely. Ranson and APACHE II correlated weakly to moderately, whereas BISAP correlated with neither. Comparative studies have shown similar predictive accuracy for these scores, but they measure different domains: BISAP is a simple 24-hour bedside tool, Ranson requires 48 hours of observation, and APACHE II captures global physiological derangement.[9,11,17] A systematic review found that no single predictor reliably identifies persistent organ failure early, with blood urea nitrogen after 48 hours among the more useful markers, and current guidelines favor serial clinical assessment of persistent organ failure and systemic inflammatory response over any one score.[12-14] Our findings support using a simple score such as BISAP for early triage, together with repeated assessment of organ function.

Supportive care formed the basis of management. Antibiotics were used in 90.00% of patients, although routine prophylaxis was not part of the protocol. This proportion is higher than guidelines would predict, because prophylactic antibiotics have not been shown to reduce infected necrosis or mortality and are recommended only for proven infection.[13,14,24] Part of this use is explained by the high rates of sepsis, organ failure and biliary involvement in this series, but the figure points to a need for antimicrobial stewardship and culture-guided therapy. Enteral nutrition was preferred to parenteral nutrition, in line with evidence that enteral feeding reduces infections, organ failure and mortality.[13,25] Moderate, goal-directed fluid resuscitation is now favored over aggressive fluid loading, which increases fluid overload without improving outcomes.[15]

Organ failure and infected necrosis are the main determinants of death in acute pancreatitis.[6,26] The mortality of 10.00% in this study lies between the low mortality of mild disease and the considerably higher mortality reported for severe necrotizing pancreatitis, in keeping with the severity mix of this sample.[5,26] The high referral rate (50.00%) suggests that patients needing advanced endoscopic, interventional radiological or prolonged intensive care were transferred, and it highlights the value of building step-up capacity within regional teaching hospitals. The step-up approach of percutaneous or endoscopic drainage followed by minimally invasive necrosectomy reduces major complications compared with primary open necrosectomy.[16] For gallstone pancreatitis, urgent ERCP is indicated only for cholangitis, and same-admission cholecystectomy after mild disease prevents recurrent biliary events.[27,28]

More than one third of patients (36.67%) were readmitted. Early readmission after acute pancreatitis occurs in about one fifth of patients and is associated with gastrointestinal symptoms at discharge, discharge before a solid diet is tolerated, and continued alcohol use.[29] Definitive treatment of gallstones, structured alcohol and smoking cessation counselling, and control of triglycerides and glucose are the most effective ways to prevent recurrence.[13,28]

This study has limitations. The sample was small and drawn from a single surgical unit, and it included no women, which limits generalizability. Severity was assessed by Ranson, BISAP and APACHE II categories but was not graded according to the revised Atlanta classification. The number and type of endoscopic, radiological and surgical interventions were not analyzed separately, and outcomes after referral were not available. The study had no long-term follow-up beyond discharge.

CONCLUSION

Acute pancreatitis in this series affected young and middle-aged men and was caused mainly by gallstones and alcohol, with smoking, diabetes and obesity as frequent associated factors. Most patients had moderate to severe disease, and Ranson, BISAP and APACHE II showed limited agreement. Management was mainly conservative, but complications, referral, readmission and mortality were frequent. Early triage with a simple bedside score, repeated assessment of organ failure, judicious antibiotic use, and timely access to step-up intervention and definitive treatment of the cause are likely to improve outcomes.

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