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EARLY PREDICTION OF SEVERE ACUTE PANCREATITIS: COMPARATIVE VALIDATION OF BISAP AND RANSON SCORING SYSTEMS IN A PROSPECTIVE COHORT

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Abstract

Background: Acute pancreatitis is a common gastrointestinal emergency with a highly variable clinical course ranging from mild, self-limiting inflammation to severe disease complicated by persistent organ failure and mortality. Early identification of patients at risk of severe acute pancreatitis is crucial for timely intervention, appropriate triage, and optimal utilization of healthcare resources. Among the available prognostic tools, the Bedside Index for Severity in Acute Pancreatitis (BISAP) and Ranson's Criteria are widely used; however, their comparative performance remains a matter of clinical interest.

Methods: This prospective observational study included 50 consecutive adult patients diagnosed with acute pancreatitis at a tertiary care centre. BISAP scores were calculated within the first 24 hours of admission, whereas Ranson's Criteria were assessed at admission and after 48 hours. Disease severity was compared between the two scoring systems and correlated with etiological factors and biochemical parameters using appropriate statistical analysis, with a p-value <0.05 considered statistically significant.

Results: The study population comprised predominantly males (70%), with alcohol (60%) and gallstone disease (36%) representing the leading etiologies. At 48 hours, hypoxemia and a hematocrit decline >10% were observed in 80% of patients, reflecting substantial systemic involvement. Ranson's Criteria classified a significantly greater proportion of patients as having severe disease than BISAP (76% vs. 42%; p=0.001). Among patients with gallstone-induced pancreatitis, severe disease was identified in 83.3% by Ranson's Criteria compared with 44.4% by BISAP. Although disease etiology was not independently associated with severity, Ranson's Criteria demonstrated greater sensitivity in detecting progressive systemic involvement, particularly in patients with elevated pancreatic enzyme levels.

Conclusions: Both scoring systems are clinically valuable for early risk stratification in acute pancreatitis. BISAP offers a rapid and practical bedside assessment suitable for early triage, whereas Ranson's Criteria provide a more comprehensive evaluation of evolving disease severity over the initial 48 hours. Their complementary use may facilitate timely clinical decision-making, particularly in resource-constrained healthcare settings.

Keywords: Acute Pancreatitis; Severity of Illness Index; Risk Assessment; Prognosis; Triage; Organ Dysfunction Scores.

1. Introduction

Acute pancreatitis (AP) is one of the most common gastrointestinal emergencies requiring hospital admission and is characterized by acute inflammation of the pancreas with highly variable clinical manifestations. The disease ranges from a mild, self-limiting episode requiring only supportive care to severe acute pancreatitis complicated by persistent organ failure, pancreatic necrosis, systemic inflammatory response syndrome (SIRS), and death. The underlying pathological process involves premature activation of pancreatic digestive enzymes within acinar cells, resulting in autodigestion of pancreatic tissue, local inflammatory injury, and the release of inflammatory mediators that may trigger widespread systemic inflammation and multiorgan dysfunction. Gallstone disease and excessive alcohol consumption remain the leading etiological factors worldwide, although hypertriglyceridemia, endoscopic retrograde cholangiopancreatography (ERCP), medications, trauma, infections, and metabolic disorders also contribute to disease development.[1,2]

The global burden of acute pancreatitis has increased considerably during the past three decades. Data from the Global Burden of Disease (GBD) Study 2021 indicate that the annual incidence of pancreatitis has risen by nearly 60%, increasing from approximately 1.73 million new cases in 1990 to 2.75 million in 2021. This increasing disease burden is largely attributed to population ageing, obesity, gallstone disease, alcohol consumption, and changing lifestyle patterns. Despite improvements in intensive care and supportive management, severe acute pancreatitis continues to be associated with prolonged hospitalization, substantial healthcare expenditure, and considerable mortality, particularly among patients who develop persistent organ failure.[3]

Early identification of patients likely to develop severe disease remains the cornerstone of effective management. Accurate risk stratification facilitates timely fluid resuscitation, appropriate intensive care unit admission, close hemodynamic monitoring, early nutritional support, and prompt management of local and systemic complications. Although contrast-enhanced computed tomography (CECT) remains the imaging modality of choice for evaluating pancreatic necrosis and local complications, it is not routinely indicated during the initial phase of illness and may not be readily available in resource-constrained healthcare settings. Consequently, several clinical scoring systems have been developed to predict disease severity using readily available clinical and laboratory parameters.[4,5]

Among these, Ranson's Criteria and the Bedside Index for Severity in Acute Pancreatitis (BISAP) score are two of the most frequently employed prognostic models. Ranson's Criteria incorporate multiple biochemical and physiological variables assessed over the first 48 hours after admission and have traditionally been regarded as a reliable predictor of severe disease. However, the requirement for serial assessment limits its usefulness in early clinical decision-making. In contrast, the BISAP score is a simple five-parameter bedside tool that can be completed within the first 24 hours of hospitalization, allowing rapid assessment without extensive laboratory investigations. Owing to its simplicity and ease of application, BISAP has gained increasing acceptance, particularly in emergency departments and resource-limited healthcare facilities. Nevertheless, differences in patient demographics, disease etiology, and healthcare infrastructure may influence the predictive performance of these scoring systems across different populations.[6]

Although several studies have compared BISAP and Ranson's Criteria, evidence from the Indian population remains limited, particularly from tertiary care centres serving heterogeneous patient populations. Moreover, regional variations in the prevalence of alcohol-related and gallstone-induced pancreatitis warrant validation of these prognostic tools within local clinical settings. Therefore, the present prospective study was undertaken to compare the performance of BISAP and Ranson's Criteria in predicting the severity of acute pancreatitis in an Indian tertiary care hospital. The findings of this study may assist clinicians in selecting an appropriate, practical, and cost-effective risk stratification tool for early clinical decision-making and optimal utilization of critical care resources.

2. Materials and Methods

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Study Design and Setting

This prospective observational study was conducted in the Department of General Surgery, Sri Guru Ram Das Institute of Medical Sciences and Research, Sri Guru Ram Das University of Health Sciences, Amritsar, Punjab, India, over an 18-month period from July 2024 to December 2025. The study was designed to compare the performance of the Bedside Index for Severity in Acute Pancreatitis (BISAP) and Ranson's Criteria for predicting disease severity among patients presenting with acute pancreatitis.

Ethical Approval

The study protocol was reviewed and approved by the Institutional Ethics Committee of SGRDIMSR (Approval No. SGRD/IEC/2024-300) before patient recruitment. The study was conducted in accordance with the ethical principles of the Declaration of Helsinki. Written informed consent was obtained from all participants prior to enrolment.

Study Population

Adult patients aged 18 years or older presenting with a diagnosis of acute pancreatitis during the study period were consecutively screened for eligibility. Acute pancreatitis was diagnosed based on the Revised Atlanta Classification, requiring the presence of at least two of the following three criteria:

- Characteristic acute upper abdominal pain consistent with pancreatitis;
- Serum amylase and/or lipase levels at least three times the upper limit of normal;
- Imaging findings suggestive of acute pancreatitis on ultrasonography, contrast-enhanced computed tomography (CECT), or magnetic resonance imaging (MRI).

Inclusion Criteria

Patients fulfilling the diagnostic criteria for acute pancreatitis and providing written informed consent were included in the study.

Exclusion Criteria

Patients younger than 18 years, pregnant or postpartum women, individuals with chronic pancreatitis, pancreatic malignancy, previous pancreatic surgery, or incomplete clinical records were excluded from the analysis.

Clinical Assessment and Data Collection

Baseline demographic characteristics, clinical history, comorbidities, etiology of pancreatitis, physical examination findings, laboratory investigations, and radiological findings were recorded using a standardized case record form at the time of admission.

Routine laboratory investigations included complete blood count, blood glucose, blood urea nitrogen (BUN), serum creatinine, serum calcium, liver function tests, serum lactate dehydrogenase (LDH), serum amylase, serum lipase, arterial blood gas analysis, and serum electrolytes. Imaging studies, including abdominal ultrasonography and contrast-enhanced CT or MRI when clinically indicated, were performed within the first seven days of admission to evaluate pancreatic morphology and identify local complications such as pancreatic necrosis.

All patients received standard institutional management according to contemporary treatment guidelines, including aggressive intravenous fluid resuscitation, analgesia, electrolyte correction, nutritional support, and additional interventions whenever clinically indicated.

Severity Assessment: Disease severity was evaluated using both the BISAP score and Ranson's Criteria.

BISAP Score

The BISAP score was calculated within the first 24 hours of hospital admission according to the criteria described by Wu et al.[6] Each of the following variables was assigned one point:

- Blood urea nitrogen >25 mg/dL
- Impaired mental status (Glasgow Coma Scale <15)
- Presence of systemic inflammatory response syndrome (SIRS)
- Age >60 years
- Presence of pleural effusion on imaging

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The BISAP score ranged from 0 to 5, with a score of ≥3 considered predictive of severe acute pancreatitis.

Ranson's Criteria

Ranson's Criteria were calculated at admission and reassessed 48 hours after hospitalization. Admission variables included[7]:

At Admission	At 48 Hours
Age> 55 years	Serum calcium < 2.0 mmol/L (<8.0 mg/dL)
WBC count > 16,000 cells/mm³	Hematocrit fall>10%
Blood glucose>11 mmol/L (>200 mg/dL)	Oxygen (hypoxemia) PaO_2<60 mmHg
Serum AST> 250 IU/L	Blood urea nitrogen increase≥1.8mmol/L (≥5mg/dL) after IV fluids
Serum LDH> 350 IU/L	Base deficit> 4 mEq/L
	Fluid sequestration> 6 L
Interpretation: If the score ≥ 3, severe pancreatitis was likely. If the score <3, severe pancreatitis was unlikely.	

A cumulative score of ≥3 was considered indicative of severe acute pancreatitis.

Outcome Measures

The primary objective of the study was to compare the severity classification obtained using BISAP and Ranson's Criteria.

Secondary analyses evaluated the association between disease severity and:

- Etiology of acute pancreatitis
- Serum amylase levels
- Serum lipase levels
- Individual clinical and laboratory variables included within each scoring system

Statistical Analysis

Statistical analysis was performed using IBM SPSS Statistics version 26.0 (IBM Corp., Armonk, NY, USA). Continuous variables were assessed for normality using the Shapiro-Wilk test and expressed as mean ± standard deviation (SD) or median with interquartile range (IQR), as appropriate. Categorical variables were summarized as frequencies and percentages. Associations between categorical variables were evaluated using the Chi-square test or Fisher's exact test whenever expected cell frequencies were less than five. A two-tailed p-value <0.05 was considered statistically significant.

Results

Table 1: Age Distribution of cases with Acute Pancreatitis (n=50)

Age Group	Female (F)	Male (M)	Total
≤30 years	2 (16.7%)	10 (83.3%)	12
31-40 years	1 (12.5%)	7 (87.5%)	8
41-50 years	1 (14.3%)	6 (85.7%)	7
51-60 years	4 (40.0%)	6 (60.0%)	10
61-70 years	4 (44.4%)	5 (55.6%)	9
>70 years	3 (75.0%)	1 (25.0%)	4
Total	15 (30.0%)	35 (70.0%)	50

Of the 50 patients enrolled, males accounted for the majority of the total population (70%). The distribution across age groups showed that patients aged 30 and below represented the largest single group (n=12 Table 1). While males dominated the younger and middle-age cohorts (up to 60 years), the gender ratio shifted toward a female majority in the oldest age group (>70 years).

Table 2: Baseline Biochemical and Hematological Characteristics of the Study Cohort (n=50)

Parameter	Median	(IQR)

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Hemoglobin (g/dL)	11.85	(9.93-13.28)
Total Leukocyte Count (cells/mm³)	13550	(10050-16550)
Neutrophils (%)	83	(79-87)
Lymphocytes (%)	10.5	(8-16.75)
Monocytes (%)	2	(2-3)
Eosinophils (%)	1	(1-1)
Platelet to Total Index (%)	84.7	(77.75-92.85)
Blood Urea Nitrogen (mg/dL)	14.54	(6.74-27.33)
Serum Creatinine (mg/dL)	1.09	(0.67-5.62)
Total Bilirubin (mg/dL)	1.36	(0.95-2.3)
Direct Bilirubin (mg/dL)	0.85	(0.56-1.61)
SGOT/AST (IU/L)	62.5	(29.25-124)
SGPT/ALT (IU/L)	40.5	(22.67-92.75)
Sodium (mEq/L)	137	(134-140.75)
Potassium (mEq/L)	4.39	(3.96-5.02)
Serum LDH (IU/L)	428	(315.75-589.25)
Random Blood Sugar (mg/dL)	145	(110-232)
Serum Calcium (mg/dL)	8.35	(7.6-8.88)
Serum Magnesium (mg/dL)	1.9	(1.8-2.05)

The Table 2 data included a clinical profile characterized by systemic inflammation and mild multi-organ stress, as evidenced by a median Total Leukocyte Count of 13550 cells/mm³ and a high Neutrophil percentage (83%). While the median values for renal and hepatic markers like Serum Creatinine (1.09 mg/dL) and ALT (40.5 IU/L) remain near the upper limit of normal, the wide Interquartile Ranges (IQR)-reaching as high as 5.62 mg/dL for creatinine and 124 IU/L for AST-indicate significant clinical variability and acute organ dysfunction in a subset of the population.

Table 3: Baseline Distribution of Individual BISAP Scoring Criteria (n=50)

BISAP	Parameter	Frequency (n)	Percent (%)
Age	≤60 years	37	74
	>60 years	13	26
BUN	≤25 mg/dL	36	72
	>25 mg/dL	14	28
Impaired Mental Status	No	50	100
	Yes	0	0
SIRS	No	18	36
	Yes	32	64
Pleural Effusion	No	4	8
	Yes	46	92

The clinical profile of the study cohort was characterized by the assessment of individual BISAP parameters (Table 3). The most frequent clinical finding was pleural effusion, present in 92% of cases, followed by SIRS, which was observed in 64% of the population. In contrast, impaired mental status was entirely absent (0%) in this group.

Table 4: Distribution of Ranson Criteria Parameters at 0 hours and 48 hours (n=50)

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0 hours	Parameter	Frequency	Percentage	48 hrs	Parameter	Frequency	Percentage
Age	≤55 years	31	62	**Serum calcium**	<8.0mg/dL	21	42
	>55 years	19	38		≥8.0mg/dL	29	58
WBC count	≤16,000 cells/mm³	33	66	**Hematocrit fall**	≤10%	10	20
	>16,000 cells/mm³	17	34		> 10%	40	80
Blood glucose	≥200 mg/dL	32	64	**Oxygen (hypoxemia)**	PaO_2 ≤60 mmHg	10	20
	<200 mg/dL	18	36		PaO_2 < 60 mmHg	40	80
Serum AST	≤ 250 IU/L	42	84	**BUN increase**	≥1.8mmol/L after IV fluids	42	84
	> 250 IU/L	8	16		<1.8mmol/L after IV fluids	8	16
Serum LDH	≤ 350 IU/L	15	30	**Base deficit**	≤ 4 mEq/L	19	38
	> 350 IU/L	35	70		> 4 mEq/L	31	62
				Fluid sequestration	≤6 L	50	100
					> 6 L	0	0

The evaluation of Ranson criteria parameters at admission (0 hours) and at 48 hours provided critical prognostic insights (Table 4). At admission, elevated LDH (>350 IU/L) and Hyperglycemia (≥200 mg/dL) were the most frequent markers, present in 70% and 64% of patients, respectively. The progression of the disease at 48 hours was marked by a high incidence of respiratory and hematological stress, with 80% of patients exhibiting both a significant hematocrit fall (>10%) and hypoxemia (PaO_2<60 mmHg).

Table 5: Association of Disease Etiology with BISAP and RANSON Severity Scores

Etiology	BISAP Mild	BISAP Severe	Ranson Mild	Ranson Severe
Alcohol (n=30)	18 (60.0%)	12 (40.0%)	9 (30.0%)	21 (70.0%)
Gall stones (n=18)	10 (55.6%)	8 (44.4%)	3 (16.7%)	15 (83.3%)
Hypertriglyceridemia (n=1)	0 (0.0%)	1 (100.0%)	0 (0.0%)	1 (100.0%)
Unknown (n=1)	1 (100.0%)	0 (0.0%)	0 (0.0%)	1 (100.0%)
Total(n=50)	29 (58.0%)	21 (42.0%)	12 (24%)	38 (76%)
p-value	0.523		0.625	

Alcohol was the most frequent etiology (n=30, 60%), followed by gallstones (n=18, 36%). For the BISAP score, no significant association was found between the etiology and the severity of the disease

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(p=0.532), with a relatively balanced distribution of mild and severe cases across all causes (Table 5). Similarly, the RANSON score showed no significant variation in its severity classification based purely on etiology (p=0.625); however, it consistently classified a larger volume of patients as severe across all categories.

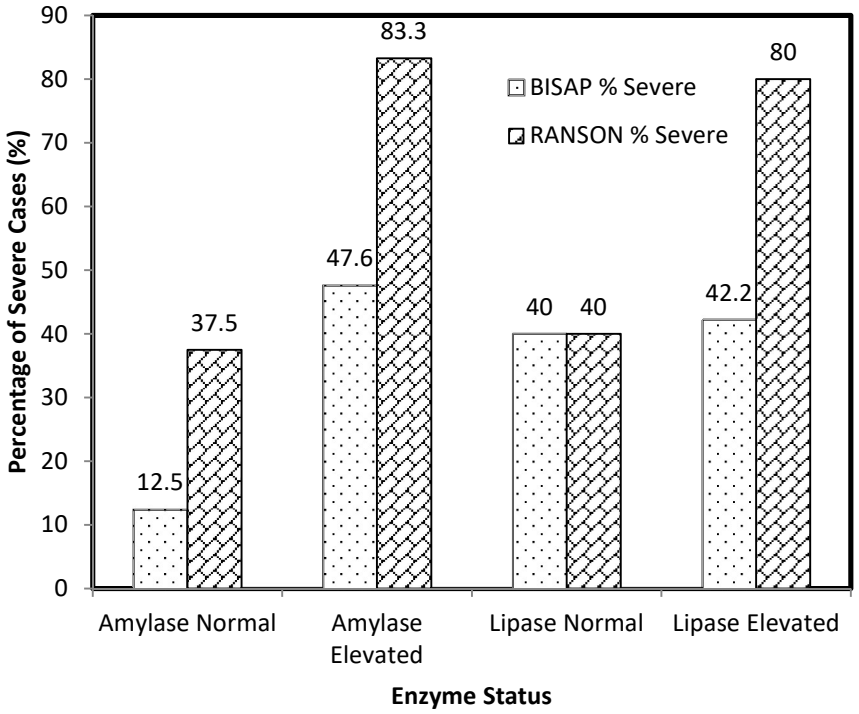

Figure 1: Comparison of Acute Pancreatitis Severity Prediction by RANSON and BISAP Scores

The RANSON score is significantly more aggressive in categorizing patients as severe when enzymes are elevated. For elevated Amylase, RANSON identifies 83.3% as severe, while BISAP identifies only 47.6% (Figure 1). Even with normal Amylase levels, the RANSON score identifies a higher percentage of severe cases (37.5%) compared to the BISAP score (12.5%). Both scores show a similar trend for Lipase, where RANSON identifies 80% severe in the elevated group compared to BISAP's 42.2%.

3. Discussion

Early risk stratification remains one of the most important determinants of clinical outcomes in acute pancreatitis, as timely recognition of patients at risk of severe disease facilitates appropriate monitoring, aggressive resuscitation, and intensive care management. The present prospective study compared the predictive performance of BISAP and Ranson's Criteria in an Indian tertiary care setting and demonstrated that although both scoring systems were useful for severity assessment, Ranson's Criteria identified a substantially greater proportion of patients with severe disease than the BISAP score.

The demographic profile of the present study revealed a predominance of younger male patients, with individuals aged ≤30 years constituting the largest age group and males accounting for 70% of the study population. Alcohol consumption emerged as the most frequent etiological factor, followed by gallstone disease. These findings are consistent with previous Indian studies[8,9,10] which similarly reported male predominance and alcohol as the principal cause of acute pancreatitis. In contrast, studies from Western countries have consistently identified gallstone disease as the predominant etiology, reflecting regional differences in lifestyle, alcohol consumption patterns, and metabolic risk factors. Such geographical variation highlights the importance of validating prognostic scoring systems across different populations before their widespread clinical application.

A notable observation in the present study was the remarkably high prevalence of pleural effusion and

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systemic inflammatory response syndrome (SIRS) during the early phase of illness. Pleural effusion was identified in more than 90% of patients and represented one of the most frequent components contributing to the BISAP score. Pleural effusion is considered an indirect marker of increased capillary permeability and systemic inflammatory activation and has consistently been associated with severe acute pancreatitis and respiratory complications. Similar observations have been reported by different authors[8,9,11] who demonstrated that pleural effusion and SIRS are among the strongest early predictors incorporated within the BISAP scoring system. The high prevalence observed in the present study further emphasizes the importance of routine chest imaging during the initial evaluation of patients with acute pancreatitis.

The biochemical profile also reflected significant systemic inflammation. Most patients demonstrated leukocytosis with neutrophilic predominance, elevated serum LDH concentrations, and markedly increased pancreatic enzyme levels. Elevated serum amylase and lipase confirmed the diagnosis of acute pancreatitis; however, their association with disease severity differed between the two scoring systems. Patients with markedly elevated enzyme levels were more frequently classified as severe according to Ranson's Criteria than BISAP. These findings support the concept that biochemical markers alone are insufficient predictors of disease progression and should be interpreted alongside comprehensive clinical assessment. Elevated LDH, in particular, reflects extensive tissue injury and has been recognized as an important indicator of pancreatic necrosis and adverse outcomes. Shah et al.[12] similarly demonstrated that elevated leukocyte counts and LDH levels are associated with increased disease severity, particularly in alcohol-related pancreatitis.

Admission laboratory findings further suggested that a substantial proportion of patients presented with severe inflammatory disease. Hyperglycemia and elevated LDH were observed in nearly two-thirds of the study population, while serial assessment at 48 hours demonstrated frequent hypoxemia, hematocrit decline, and rising blood urea nitrogen levels, indicating ongoing systemic inflammation and evolving organ dysfunction. Persistent hypoxemia and hemoconcentration are well-recognized predictors of poor prognosis because they reflect increased vascular permeability, third-space fluid losses, and pulmonary involvement. Comparable findings have been described by Nambi and Giridharan[9], who reported similar frequencies of hyperglycemia and elevated LDH among patients with severe pancreatitis. These observations reinforce the importance of serial clinical and biochemical monitoring during the early phase of disease.

The principal finding of this study was the significant difference in severity classification between BISAP and Ranson's Criteria. Ranson's Criteria classified 76% of patients as having severe acute pancreatitis, whereas BISAP identified only 42% of cases as severe. This difference is biologically plausible because the Ranson scoring system incorporates eleven physiological and biochemical variables assessed over the first 48 hours of hospitalization, thereby capturing the progression of systemic inflammatory response and evolving organ dysfunction. In contrast, BISAP is designed as an early bedside tool using only five readily available variables within the first 24 hours of admission. Consequently, BISAP may underestimate disease severity during the initial phase in patients who subsequently develop progressive organ dysfunction. Similar differences between these scoring systems have been reported by Shabbir et al.[13] and Naresh et al.[14], both of whom concluded that Ranson's Criteria demonstrate greater sensitivity for identifying severe acute pancreatitis, whereas BISAP provides higher specificity for early bedside assessment.

Although alcohol-related pancreatitis constituted the largest etiological subgroup in the present study, disease severity was not significantly associated with the underlying cause of pancreatitis. Similar observations have been reported by Shabbir et al.[13], suggesting that clinical outcomes are determined primarily by the magnitude of the host inflammatory response rather than by the initiating etiological factor. This concept is consistent with the current understanding of acute pancreatitis, in which activation of inflammatory cytokines, endothelial dysfunction, and microcirculatory impairment play

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central roles in the progression from local pancreatic injury to systemic organ failure.

The comparative performance of the two scoring systems observed in the present study is further supported by contemporary evidence. A recent systematic review and meta-analysis by Zhu et al.[15] involving 5,476 patients demonstrated that Ranson's Criteria had superior pooled sensitivity for predicting severe acute pancreatitis, whereas BISAP exhibited greater specificity. These findings closely parallel the results of the present study and suggest that both scoring systems provide complementary rather than competing clinical information. While Ranson's Criteria remain valuable for comprehensive severity assessment, BISAP offers the practical advantage of rapid bedside application without requiring prolonged observation or extensive laboratory investigations.

From a clinical perspective, the findings of the present study support the use of BISAP as an effective early screening tool, particularly in emergency departments and resource-limited healthcare settings where rapid triage is essential. Patients identified as high risk by BISAP can undergo closer monitoring and early intensive management while awaiting further clinical evolution. Conversely, Ranson's Criteria remain valuable for confirming disease severity after 48 hours and may provide superior prognostic assessment once complete clinical and biochemical information becomes available. Similar conclusions were drawn by Aggarwal et al.[16], demonstrated that despite its simplicity, BISAP maintains satisfactory predictive accuracy for severe acute pancreatitis and represents an efficient alternative to more complex prognostic models.

Overall, the findings of the present study suggest that BISAP and Ranson's Criteria should be viewed as complementary tools rather than mutually exclusive scoring systems. BISAP facilitates rapid bedside decision-making during the initial phase of hospitalization, whereas Ranson's Criteria provide a more comprehensive assessment of evolving systemic injury. Combining early bedside assessment with subsequent serial evaluation may optimize risk stratification, improve resource allocation, and ultimately contribute to better clinical outcomes in patients with acute pancreatitis.

Study Limitations

The present study has several limitations. First, it was conducted at a single tertiary care centre with a relatively small sample size, which may limit the generalizability of the findings to broader populations. Second, the study compared only BISAP and Ranson's Criteria without evaluating other established prognostic models such as APACHE II, Modified Marshall Score, SOFA, or the CT Severity Index. Third, long-term clinical outcomes, including mortality, duration of intensive care, hospital stay, and local pancreatic complications, were not systematically analyzed. Finally, the absence of receiver operating characteristic (ROC) curve analysis and external validation limits the comprehensive assessment of the diagnostic performance of the two scoring systems. Larger multicentre prospective studies incorporating multiple prognostic models and clinically relevant outcomes are warranted to validate these findings and establish the most appropriate risk stratification strategy for patients with acute pancreatitis.

4. Conclusion

The present study demonstrates that both BISAP and Ranson's Criteria are valuable tools for early severity assessment in patients with acute pancreatitis, although each serves a distinct clinical purpose. Ranson's Criteria identified a greater proportion of patients with severe disease, reflecting its ability to capture the progression of systemic inflammatory response over the initial 48 hours of hospitalization. In contrast, the BISAP score provides a rapid, simple, and practical bedside assessment within the first 24 hours, making it particularly useful for early risk stratification and timely clinical decision-making. Given its ease of application and minimal laboratory requirements, BISAP may be especially advantageous in emergency departments and resource-constrained healthcare settings, where prompt identification of high-risk patients can facilitate appropriate monitoring, early intensive management, and optimal utilization of critical care resources. The complementary use of both scoring systems may enhance prognostic accuracy and improve the overall management of acute pancreatitis.

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Abbreviations

Abbreviation	Full Form
AP	Acute Pancreatitis
BISAP	Bedside Index for Severity in Acute Pancreatitis
SIRS	Systemic Inflammatory Response Syndrome
BUN	Blood Urea Nitrogen
LDH	Lactate Dehydrogenase
AST	Aspartate Aminotransferase
ALT	Alanine Aminotransferase
CECT	Contrast-Enhanced Computed Tomography
MRI	Magnetic Resonance Imaging
ERCP	Endoscopic Retrograde Cholangiopancreatography
GCS	Glasgow Coma Scale
PaO_2	Partial Pressure of Arterial Oxygen

Declarations

Ethical Approval and Consent to Participate

The study was approved by the Institutional Ethics Committee of Sri Guru Ram Das Institute of Medical Sciences and Research, Sri Guru Ram Das University of Health Sciences, Amritsar (Approval No. SGRD/IEC/2024-300). The study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. Written informed consent was obtained from all participants prior to enrolment.

Consent for Publication

Not applicable.

Availability of Data and Materials

The datasets generated and/or analysed during the current study are available from the corresponding author upon reasonable request.

Competing Interests

The authors declare that they have no competing interests.

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Authors' Contributions

Anumaan Singh Padda: Conceptualization, methodology, data collection, patient recruitment, investigation, data curation, and preparation of the original manuscript.

Darpan Bansal: Study supervision, conceptualization, methodology, clinical guidance, interpretation of data, critical revision of the manuscript, and final approval of the submitted version.

Mohit Sharma: Clinical supervision, patient management, data interpretation, manuscript review, and critical revision for important intellectual content.

Prabhjot Kaur Gill: Statistical analysis, data validation, formal analysis, interpretation of results, manuscript editing, and final approval of the manuscript.

All authors read and approved the final manuscript.

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