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ORIGINAL ARTICLE

Assessing the Predictive Value of Inflammation-based Scores in Acute Pancreatitis Severity

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Abstract

Background: Acute pancreatitis (AP) is a disease characterized by acute inflammation of the pancreas and histological destruction of acinar cells, most commonly caused by gallstones or excessive alcohol use. In most patients, the disease is mild, but in approximately 20-30% of cases, it presents in a severe form, which can be life-threatening. The severity of acute pancreatitis is classified as mild, moderate, or severe according to the 2012 revision of the Atlanta classification. Early diagnosis of severe acute pancreatitis (SAP) and identification of patients at high risk for complications are crucial for effective treatment. Several inflammation-based scores, including HALP, CAR, SII, PIV, and SIRI, are used to predict the severity of pancreatitis by evaluating inflammation and nutritional status. The aim of this study is to assess the effectiveness of these inflammation indices in predicting the severity of acute pancreatitis in a group of patients.

Methods: This is a single-center, retrospective study including 213 patients diagnosed with AP. Patients were classified into two groups based on the revised Atlanta criteria: mild acute pancreatitis (MAP) and moderate/severe acute pancreatitis (SAP). The relationship between the severity of AP and various inflammation-based scores (HALP, CAR, SII, PIV, SIRI) were analyzed.

Results: The study included 213 patients. According to the revised Atlanta criteria, 82.6% of patients were diagnosed with mild pancreatitis, 15.5% with moderate pancreatitis, and 1.9% with severe pancreatitis. The HALP score, CAR, PIV, SII and SIRI scores did not show significant differences between the two groups. ROC analysis revealed that these laboratory results and inflammation scores were not significant in predicting the severity of pancreatitis.

Conclusion: This study found no significant association between HALP, CAR, SII, SIRI, or PIV scores and acute pancreatitis severity, contrary to previous research. Larger studies are needed.

Keywords: Acute pancreatitis, inflammation, revised atlanta criteria.

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INTRODUCTION

Acute pancreatitis (AP) is a complex inflammatory disorder that can range from mild to severe, with potentially life-threatening consequences. While gallstones and excessive alcohol consumption are the primary culprits, other factors such as certain medications, metabolic disorders, and genetic predisposition can also trigger the condition. The inflammatory process in AP leads to the release of digestive enzymes within the pancreas itself, causing autodigestion and tissue damage. This can result in a cascade of local and systemic inflammatory responses, potentially leading to complications such as pancreatic necrosis, pseudocysts, and organ failure (1).

The management of AP requires a multidisciplinary approach, with treatment strategies tailored to the severity of the disease. In mild cases, conservative management with fluid resuscitation, pain control, and nutritional support is often sufficient. However, severe cases may necessitate intensive care, advanced imaging techniques, and interventional procedures. Early recognition of severe AP is crucial, as timely intervention can significantly improve outcomes. Recent advances in understanding the pathophysiology of AP have led to the development of novel therapeutic approaches, including targeted anti-inflammatory agents and personalized treatment protocols. Despite these advancements, severe AP remains a challenging condition with substantial morbidity and mortality, underscoring the need for continued research and improved management strategies (2).

The 2012 revision of the Atlanta classification system for acute pancreatitis provides a standardized framework for assessing disease severity, which is crucial for appropriate patient management and clinical decision-making. This classification system categorizes acute pancreatitis into three distinct levels of severity: mild, moderate, and severe. Mild acute pancreatitis is characterized by interstitial edema without organ failure or complications, typically resolving within a week. Moderate cases involve transient organ failure lasting less than 48 hours, local complications, or exacerbation of pre-existing comorbidities. Severe acute pancreatitis is defined by persistent organ failure extending beyond 48 hours (3).

This classification system's significance lies in its ability to guide clinical management and predict patient outcomes. Mild cases generally have a favorable prognosis and may be managed conservatively, while moderate and severe cases require more intensive monitoring and intervention. The distinction between transient and persistent organ failure is particularly important, as it helps clinicians identify patients at higher risk for complications and mortality. Local complications, such as pancreatic necrosis or pseudocysts, and systemic complications, including acute respiratory distress syndrome or acute kidney injury, play a crucial role in determining the severity and course of the disease. By providing a standardized approach to severity assessment, the Atlanta classification facilitates communication among healthcare providers and enables more consistent and effective treatment strategies for patients with acute pancreatitis.

The diagnosis of (AP) relies on a combination of clinical, biochemical, and radiological findings. Abdominal pain, typically severe and located in the upper abdomen, is a hallmark symptom. This pain may radiate to the back and is often accompanied by nausea and vomiting. Biochemical markers, particularly elevated serum amylase and lipase levels, provide objective evidence of pancreatic inflammation. Imaging studies, such as computed tomography (CT) or magnetic resonance imaging (MRI), can reveal characteristic changes in pancreatic morphology, including swelling, edema, or necrosis.

Various scoring systems and predictive models have been developed to assess disease severity and stratify patients according to their risk of complications. These tools incorporate clinical, laboratory, and radiological parameters to provide a more comprehensive evaluation of the patient's condition and guide treatment decisions. Prompt recognition and management of SAP can help prevent or mitigate potentially life-threatening complications such as pancreatic necrosis, organ failure, and systemic inflammatory response syndrome.

Inflammation scores play a crucial role in predicting the severity of pancreatitis and assessing overall immune and nutritional status. These scores integrate various routinely measured parameters to provide a comprehensive evaluation of a patient's condition. The Hemoglobin, Albumin, Lymphocyte, and Platelet (HALP) score, for instance, combines immune status indicators like platelet and lymphocyte counts with nutritional markers such as albumin and hemoglobin levels (6). This multifaceted approach allows for a more nuanced assessment of the patient's overall health status. Similarly, the CAR score, which expresses the C-reactive protein (CRP) / Albumin ratio, offers insights into both inflammation and nutrition (7), providing clinicians with valuable information for patient management.

Other inflammation scores, such as Systemic Immune-Inflammation Index (SII), Platelet to Inflammatory cell ratio in peripheral blood (PIV), and Systemic Inflammation Response Index (SIRI), focus on different aspects of the immune response and inflammatory processes. The SII, calculated using neutrophil, platelet, and lymphocyte counts, has been associated with various inflammatory diseases (8-10). The PIV score incorporates neutrophil, platelet, monocyte, and lymphocyte counts to evaluate inflammation (11, 12), while the SIRI score considers the relationship between neutrophils, monocytes, and lymphocytes (13, 14). These diverse scoring systems offer clinicians a range of tools to assess inflammation from different perspectives, enabling more accurate diagnosis, prognosis, and treatment planning in patients with pancreatitis and other inflammatory conditions.

The Ranson criteria have long been considered a gold standard for assessing the severity of pancreatitis based on laboratory findings. This scoring system takes into account various parameters, including age, white blood cell count, blood glucose, serum lactate dehydrogenase, and serum aspartate aminotransferase levels at admission, as well as additional factors measured 48 hours later. While the Ranson criteria provide valuable prognostic information, the 48-hour delay in obtaining a complete assessment can be a significant drawback in clinical practice, potentially delaying crucial interventions for patients with severe pancreatitis (15).

This study aimed to evaluate the effectiveness of inflammation indices accepted in the literature, such as HALP score, SII, CAR score, PIV, SIRI, in predicting the severity in a group of patients with acute pancreatitis. The study focused on assessing the predictive power of various inflammation indices for determining the severity of acute pancreatitis. The indices examined included the HALP score, SII, CRP to Albumin Ratio (CAR), PIV, and SIRI. These indices have been previously established in medical literature as potential markers for inflammatory conditions.

The research aimed to compare and evaluate the efficacy of these inflammation indices specifically in the context of acute pancreatitis. By analyzing these markers in a cohort of patients diagnosed with acute pancreatitis, the study sought to identify which indices, if any, could reliably predict the severity of the condition. This information could be valuable for clinicians in making early assessments of patient prognosis and tailoring treatment strategies accordingly. The findings of this study may contribute to improving the management of acute pancreatitis by providing a more accurate and timely prediction of disease severity.

MATERIALS AND METHODS

This single-center study focuses on acute pancreatitis patients who were hospitalized at Amasya Sabuncuoğlu Şerefeddin Training and Research Hospital over a six-year period between January 1, 2018, and December 31, 2024. The research team retrospectively analyzed data from 213 adult patients, all of whom were 18 years or older at the time of diagnosis. By examining this cohort, the study aims to provide insights into the characteristics, treatment outcomes, and potential risk factors associated with acute pancreatitis in this healthcare setting.

The study focused on acute pancreatitis patients, excluding those with cancer, ischemic stroke history, and autoimmune or inflammatory diseases. Patients were categorized into groups based on both the Revised Atlanta Criteria and the World Society of Emergency Surgery (WSES) criteria the most frequently utilized pancreatitis classifications. Specifically, the cohort was stratified into Mild Acute Pancreatitis (MAP) and a combined group of Moderate and Severe Acute Pancreatitis (SAP). These classifications facilitated a comparative analysis of disease severity and its associated factors.

The research methodology involved collecting clinical and demographic data from patient files, including initial laboratory results upon hospitalization. The study aimed to investigate the relationship between various parameters and the severity of acute pancreatitis. These parameters included age, gender, white blood cell count, neutrophil levels, albumin, AST, amylase, lipase, CRP, direct bilirubin, and several inflammation-related scores such as the systemic immune inflammation (SII) score, HALP score, CAR, PIV, and systemic inflammation response index (SIRI) score. By examining these factors, the researchers sought to identify potential indicators or predictors of pancreatitis severity, which could aid in early diagnosis and appropriate treatment strategies.

Acute pancreatitis was diagnosed using clinical, laboratory and radiological examination results, such as epigastric pain, elevated amylase-lipase levels (at least three times higher than the upper limit of normal), including pancreatic inflammation checked by a computed tomography scan. The patients' complete blood count (CBC) and biochemistry data at diagnosis were recorded. Externally, clinical and demographic data of the patiens' such as gender and age were obtained from the hospital database and epicrisis information and recorded. HALP, CAR, SII, PIV, SIRI scores were calculated using the data obtained from the patients' CBC and biochemical laboratory results. HALP score was calculated by (hemoglobin×albumin×lymphocyte count)/platelet count; CAR score by CRP/albumin; SII score by (neutrophil count × platelet count)/lymphocyte count; PIV score by (neutrophil count × platelet count × monocyte count)/lymphocyte count; SIRI score by (neutrophil count × monocyte count)/lymphocyte count; and PNI score by serum albumin + total lymphocyte count×0.005. Then, the relationship between the MAP and SAP groups was examined using these scores.

Ethical Statement

The researchers received ethical approval for the study from the Amasya University Non-Interventional Ethics Committee with extension approval number 2024/173. This approval ensures that the study adheres to ethical guidelines and protects patient privacy and confidentiality. Furthermore, the study was conducted in accordance with the principles outlined in the Declaration of Helsinki, which is a set of ethical principles developed by the World Medical Association to guide medical research involving human subjects. This adherence underscores the researchers' commitment to maintaining high ethical standards throughout the study, including respect for patient autonomy, beneficence, and justice in medical research.

Statistical Analyses

The data were analyzed using IBM SPSS Statistics version 25.0 software (IBM Corp., Armonk, NY, USA). The descriptive statistics are presented as number of units (n), percentage (%), mean ± standard deviation (SD) or median (Q1-Q3) values. Pearson Chi-Square test and Fisher's Exact test were used to evaluate categorical variables. Normality of numerical variables was evaluated using normality test and Q-Q plots. Independent Samples T-test was used for variables showing normal distribution and Mann-Whitney U test was used for variables not showing normal distribution for comparison of two groups. The patients were categorized as mild or severe pancreatitis according to clinical findings.

ROC analysis was performed to evaluate the effectiveness of inflammatory markers in predicting the severity. Threshold values were determined using the Youden index. A p value of <0.05 was considered statistically significant.

RESULTS

The study included 213 patients, 79 male and 134 female. The average age of the patients was 65.9±18.1 years. According to the revised Atlanta scoring, 176 (82.6%) of the patients were diagnosed with mild, 33 (15.5%) moderate and 4 (1.9%) severe pancreatitis (Table 1). Wbc, neutrophil count, albumin, AST, direct bilirubin, amylase, lipase and CRP levels in the blood were similar in patients with severe and mild pancreatitis. HALP Score, CAR, PIV, SII and SIRI scores were not different between patients with severe and mild pancreatitis (Table 2). In the ROC analysis, laboratory results, HALP Score, CAR, PIV, SII and SIRI scores were not found to have any significant value in predicting the severity of pancreatitis (Table 3).

DISCUSSION

Acute pancreatitis is a complex condition that can lead to severe complications and even death in extreme cases, particularly when pancreatic necrosis occurs. The importance of swift assessment and accurate determination of disease severity in patients presenting with acute pancreatitis cannot be overstated. Emergency department physicians must employ a comprehensive approach to evaluate these patients promptly, as early intervention and appropriate management can significantly impact patient outcomes and treatment efficacy.

The diagnostic process for acute pancreatitis involves a multi-faceted approach, utilizing various biomarkers and inflammatory mediators. Initial laboratory tests typically include serum amylase and lipase levels, which are often elevated in acute pancreatitis. A complete blood count can reveal leukocytosis, while a

Table 1. Demographic Data	
Age(year)	65.9±18.1
Gender	
Male	79 (37.1%)
Female	134 (62.9%)
Classification based on Revised Atlanta Score	
Mild	176 (82.6%)
Moderate	33 (15.5%)
Severe	4 (1.9%)
Classification based on WSES definition	
Mild	189 (88.7%)
Moderate	20 (9.4%)
Severe	4 (1.9%)

Data are shown as average±ss and number (%)
WSES: World Society of Emergency Surgery

metabolic panel provides crucial information on renal function, blood glucose levels, and electrolyte imbalances. Elevated triglyceride levels may indicate a potential underlying cause of pancreatitis. Urinalysis can help assess hydration status and rule out other abdominal conditions, while arterial blood gas analysis provides insight into acid-base balance and oxygenation. These diagnostic tools, when used in conjunction with clinical presentation and imaging studies, enable healthcare providers to make informed decisions regarding patient care and treatment strategies (16).

The prediction of pancreatitis severity remains a critical challenge in clinical practice, particularly due to the time-sensitive nature of current assessment methods. Traditional tests and scoring systems often require a 48-hour observation period following initial presentation, which can delay crucial treatment decisions and potentially impact patient outcomes. This limitation has prompted researchers to explore alternative approaches for early and accurate prediction of pancreatitis severity. In response to this clinical need, recent studies have focused on evaluating the efficacy of various inflammation-related scores in predicting pancreatitis severity. These scores, which are often based on readily available clinical and laboratory parameters, aim to provide a more immediate assessment of the disease's potential progression. Our study contributes to this body of research by examining the predictive power of select inflammation-associated scores. By investigating these markers, we seek to identify reliable indicators that can guide clinicians in making timely and informed decisions regarding patient management and treatment strategies in the early stages of pancreatitis presentation.

The role of CRP as a predictor of severe acute pancreatitis has been extensively studied, with numerous investigations and meta-analyses exploring its effectiveness as an acute phase reactant. While many studies have supported the utility of CRP in this context, the findings remain inconsistent. The current study's results contradict some previous research, as it did not find CRP to

Table 2. Comparison of Blood Parameters and Inflammation Scores in Patients with Mild and Severe Acute Pancreatitis

	Mild (MAP)		Severe (SAP)		p*
	Average±SD	Median (smallest-largest)	Average±SD	Median (smallest-largest)	
WBC 10^3/uL	12.23±4.691	11.7(0.7-29.3)	12.54±4.54	11.8(5.7-23.8)	0.717
Neutrophil count 10^3/uL	9.82±4.74	9.3(0.01-25.7)	9.95±4.61	8.8(2.7-21.4)	0.901
Albumin g/L	36.4±6.1	37.0(3.0-48.1)	36.1±5.9	36.2(25-47.5)	0.595
AST	220±241	144(17-1567)	184±201	111(10-861)	0.280
Direct Bilirubin	1.03±1.51	0.47(0.03-11.8)	1.00±1.07	0.74(0.01-3.92)	0.622
Amylase	1536±1496	1208(12-7958)	1715±1754	1398(36-7053)	0.742
Lipase	3534±3667	2631(4-22735)	3538±3687	2467(37-17193)	0.895
CRP mg/L	39.45±62.22	10.5(0.25-385.4)	45.19±64.37	11.8(1.0-224.7)	0.472
HALP Score	36.75±48.41	27.7(2.1-583.9)	31.63±24.11	26.6(1.4-98.6	0.683
CAR(CRP/ALB)	0.12±0.21	0.03(0.00-1.46)	0.14±0.22	0.03(0.00-0.90)	0.492
SII Score 10^9/L	2463.24±3250.57	1597(3.2-33259.7)	4372.25±11181.75	1617 (328-68002)	0.645
PIV Score 10^9/L	1750.23±20506.50	952(0.3-20621.0)	3030.69±6610.65	1005 (95.8-37401.2)	0.751
SIRI Score 10^9/L	7.17±9.33	4.2(0.00-56.5)	7.28±10.56	3.6(0.4-56.0)	0.727

**Mann Whitney U Test*
MAP: Mild Acute Pancreatitis, SAP: Severe Acute Pancreatitis, SD: Standard Deviation, WBC: White Blood Count, AST: Aspartate Aminotransferase, CRP: C-Reaktif Protein, HALP: Hemoglobin-Albumin-Lymphocytes-Platelets, CAR: CRP-Albumin Ratio, SII: Systemic Immune-Inflammation Index, PIV: Pan Immune-Inflammation Value, SIRI: Systemic Inflammation Response Index

be a reliable marker for predicting pancreatitis severity. This discrepancy highlights the complexity of using biomarkers in clinical practice and the need for further investigation. Contrasting findings have been reported in the literature. For instance, Fujiwara et al. (17) demonstrated a correlation between elevated CRP levels and necrotizing pancreatitis, suggesting its potential as a predictive tool. Similarly, Walker et al. (18) concluded that CRP was an effective marker for assessing pancreatitis severity, which stands in opposition to the current study's findings. A recent meta-analysis by Wu et al. (19) further emphasized the significance of CRP as a biomarker in evaluating acute pancreatitis severity. These conflicting results underscore the importance of considering multiple factors and potentially combining different biomarkers to improve the accuracy of predicting severe acute pancreatitis in clinical settings.

The HALP score, a biomarker closely linked to inflammation, has garnered attention in medical research due to its potential diagnostic and prognostic value. While limited studies have explored its relationship with pancreatitis, the current research landscape presents mixed findings. This study's inability to establish a correlation between HALP score and pancreatitis severity high-

Table 3. Effectiveness of Blood Parameters in Predicting Severe Pancreatitis According to the Revised Atlanta Classification

Variable	AUC	SE	95% CI Lower limit	95% CI Upper limit	p*
WBC	0.519	0.052	0.418	0.620	0.717
Neutrophil count	0.507	0.052	0.405	0.608	0.901
Albumin	0.472	0.054	0.366	0.579	0.595
AST	0.443	0.052	0.341	0.546	0.280
Direct Bilirubin	0.526	0.054	0.421	0.631	0.622
Amylase	0.517	0.053	0.413	0.622	0.742
Lipase	0.507	0.051	0.407	0.607	0.895
CRP	0.538	0.051	0.437	0.638	0.472
HALP Score	0.479	0.050	0.381	0.577	0.683
CAR(CRP/ALB)	0.536	0.051	0.436	0.636	0.492
SII Score	0.524	0.051	0.423	0.625	0.645
PIV Score	0.517	0.052	0.415	0.619	0.751
SIRI Score	0.482	0.052	0.381	0.583	0.727

**ROC analysis*
AUC: Area Under Curve, SE: Standard Error, CI: Confidence Interval, WBC: White Blood Count, AST: Aspartate Aminotransferase, CRP: C-Reaktif Protein, HALP: Hemoglobin-Albumin-Lymphocytes-Platelets, CAR: CRP-Albumin Ratio, SII: Systemic Immune-Inflammation Index, PIV: Pan Immune-Inflammation Value, SIRI: Systemic Inflammation Response Index

lights the complexity of this relationship and the need for further investigation. Contrasting results from other studies underscore the importance of continued research in this area. Guler et al. (20) suggested that the HALP score could serve as a valuable biomarker for predicting both severity and mortality in pancreatitis patients. However, Ozkan et al. (22) found that while the HALP score was not effective in predicting mortality, it showed promise in forecasting the length of hospital stay. These divergent findings emphasize the need for larger-scale studies with more diverse patient populations to elucidate the true potential of the HALP score in pancreatitis assessment. Such comprehensive research could provide a more definitive understanding of the HALP score's effectiveness and its potential applications in clinical practice for managing pancreatitis.

The relationship between CAR score (CRP/albumin ratio) and pancreatitis severity has been a subject of extensive research in medical literature. While our study did not find an association between CAR score and pancreatitis severity, it is important to note that this finding contrasts with most of the existing research on the topic. Numerous studies have reported a significant correlation between these two factors, suggesting that

CAR score may be a valuable predictor of pancreatitis severity.

Two notable studies highlight the prevailing view in the field. Mariadi et al. (23) conducted a meta-analysis involving 2244 patients, which revealed that individuals with severe acute pancreatitis exhibited higher CRP/albumin ratios at the time of presentation compared to those with mild-moderate acute pancreatitis. Similarly, Tarar et al. (24) reviewed data from 956 patients and identified a positive relationship between initial CRP/albumin ratios and the subsequent development of severe acute pancreatitis. Their findings also indicated that higher CAR scores were associated with increased length of hospital stay and higher mortality rates. These studies underscore the potential clinical utility of the CAR score in assessing pancreatitis severity and predicting patient outcomes, despite the contradictory results observed in our study.

In the literature, SII score has been described as a good inflammation marker. Its effectiveness in predicting the severity of pancreatitis has also attracted attention from researchers. In our patient group, SII score could not be defined as a good biomarker for predicting the severity of pancreatitis. However, extensive opinion in the literature mentions a relationship between SII and pancreatitis severity. Liu et al. (10) showed that SII is a potential marker for predicting the severity of acute pancreatitis. In this study, researchers stated that patients with an SII value of ≥2207.53 were more likely to have severe acute pancreatitis with a sensitivity of 92.9% and a specificity of 87.7%. Biyik et al. (25) reported in a study conducted on a group of 332 patients that SII index could be used as a potential biomarker for predicting both the severity of the disease and the development of acute renal failure in patients with acute pancreatitis. In another study conducted with 131 patients, Balas et al. (26) showed that SII score is a good biomarker in predicting severe acute pancreatitis.

The discrepancy in findings regarding the SIRI (Systemic Inflammation Response Index) and PIV (Platelet-to-Interleukin-6 Ratio) scores as biomarkers for predicting the severity of acute pancreatitis highlights the complexity of this condition and the ongoing research efforts to identify reliable prognostic indicators. While the current study did not find these scores to be effective predictors, other researchers have reported contrasting results. Biyik et al. (25) demonstrated a correlation between SIRI score and both pancreatitis severity and the development of acute renal failure, suggesting potential clinical utility. Similarly, Dao et al. (27) emphasized the significance of the SIRI score, particularly when used in conjunction with the BISAP (Bedside Index for Severity in Acute Pancreatitis) score, in predicting acute pancreatitis severity and guiding patient management. These conflicting outcomes underscore the need for further investigation into the reliability and applicability of SIRI and PIV scores across diverse patient populations and clinical settings. Factors such as study design, sample size, patient demographics, and the specific methodologies employed in calculating these scores may contribute to the variability in results. As research in this area continues, it is crucial to consider these biomarkers alongside other established prognostic tools and clinical parameters to develop a more comprehensive and accurate approach to assessing and managing acute pancreatitis severity.

Acute pancreatitis represents a significant health concern, frequently resulting in hospitalizations within general surgery and internal medicine departments. The condition's severity can vary widely, with severe cases potentially leading to substantial morbidity and mortality. Recognizing and accurately assessing the severity of acute pancreatitis is crucial for implementing appropriate treatment strategies and improving patient outcomes. This recognition has driven extensive research efforts aimed at developing and validating various scoring systems and biomarkers to predict disease severity and guide clinical management. Despite the wealth of research and the development of numerous inflammation scores designed to predict the severity of acute pancreatitis, the findings of this particular study challenge the prevailing consensus in the medical literature. The researchers evaluated commonly used inflammation scores in a local patient cohort but found no significant association between these scores and the severity of pancreatitis. This unexpected result underscores the complexity of acute pancreatitis and highlights the potential limitations of applying generalized scoring systems across diverse patient populations. It also emphasizes the need for continued research to develop more accurate and universally applicable methods for assessing pancreatitis severity, potentially considering factors such as genetic predisposition, environmental influences, or regional variations in disease presentation and progression.

The retrospective single-center design of this study presents inherent limitations in terms of data collection and generalizability. Retrospective studies rely on existing data, which may be incomplete or subject to bias, potentially affecting the accuracy of the results. Additionally, the single-center approach restricts the diversity of the patient population, limiting the applicability of findings to broader demographics or healthcare settings. We hypothesize that the lack of statistical significance for certain scoring systems in our study may be attributable to the single-center, retrospective design and the limited number of complicated cases observed. The current findings of this study lack sufficient reliability for direct implementation in clinical practice; however, they serve as a pioneering basis for future investigations in this domain. Therefore, we believe that this topic warrants further support through subsequent multi-center, prospective studies that include a proportion of complicated cases consistent with the established literature rates. The relatively small sample size further compounds these limitations, potentially reducing the statistical power of the study and increasing the likelihood of Type II errors. To address these limitations, future research should prioritize larger, multi-center prospective studies. Such studies would allow for more robust data collection, improved statistical power, and enhanced generalizability of results across diverse patient populations and healthcare environments. Furthermore, a more comprehensive investigation of inflammatory markers could provide deeper insights into the underlying mechanisms and potential clinical implications. This expanded approach would not only validate the current findings but also potentially uncover new relationships and biomarkers, thereby significantly contributing to the existing body of knowledge on this subject.

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Abbreviations List

AP: Acute pancreatitis
SAP: severe acute pancreatitis
MAP: mild acute pancreatitis
CT: computed tomography
MRI: magnetic resonance imaging
HALP: Hemoglobin, Albumin, Lymphocyte, and Platelet
SII: Systemic Immune-Inflammation Index
CAR: C-reactive protein to Albumin Ratio
PIV: Platelet to Inflammatory cell ratio in peripheral blood
SIRI: Systemic Inflammation Response Index
WSES: World Society of Emergency Surgery
CRP: C-reactive protein
CBC: complete blood count
SD: Standard deviation
AUC: Area Under Curve
SE: Standard Error
CI: Confidence Interval
WBC: White Blood Count,
AST: Aspartate Aminotransferase
BISAP: Bedside Index for Severity in Acute Pancreatitis

Ethics Approval and Consent to Participate

The researchers received ethical approval for the study from the Amasya University Non-Interventional Ethics Committee with extension approval number 2024/173. No animal subjects were used in the study. Because the study was retrospective and did not use personal patient information, the ethics committee did not require any consent form.

Consent for Publication

There is no personal data of any person in the study.

Availability of Data and Materials

The study data is stored digitally. It is in the hospital information system and is not publicly available due to the protection of personal data. However, for scientific reasons, it can be made available upon request by the corresponding author.

Competing Interests

None of the authors have any conflict of interest in the study.

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Author Contributions

Idea/Concept: FC, SO. Design: FC, BBS. Control/Supervision FC, ID. Data Collection And/Or Processing: ID, SO. Analysis And/Or Interpretation: ID, SO. Literature Review: FC, BBS. Writing The Article: FC, ID. Critical Review: BBS, SO. References and Fundings: FC. Materials: SO.

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