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## ORIGINAL ARTICLE

# The Role of Blood Parameters and Inflammatory Scoring Systems in Prognostic Prediction in Pediatric Pancreatitis Patients

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## ABSTRACT

***Background:*** **Acute pancreatitis (AP) is an acute inflammatory disease primarily involving the pancreas and can affect all age groups. Acute recurrent pancreatitis (ARP) refers to two distinct episodes of AP. In children, pancreatitis typically presents as a single uncomplicated episode, but it can also manifest as ARP and progress to chronic pancreatitis. Pediatric AP differs clinically from adult AP and requires specific diagnostic and therapeutic approaches. Although pediatric AP has lower mortality rates compared to adult AP, it may still lead to significant morbidity and complications. This study aimed to evaluate the relationship of laboratory parameters and inflammatory scores with etiology, clinical features, and prognosis in pediatric pancreatitis.**

***Methods:*** **The Akgün database of Malatya Training and Research Hospital was retrospectively reviewed. Between January 2020 and December 2024, epicrisis reports of 46 hospitalized patients coded as ICD-10 K85 (acute pancreatitis) or K85.9 (unspecified acute pancreatitis) were examined. Patients were classified according to the INSPPIRE (International Study Group of Pediatric Pancreatitis: In Search for a Cure) criteria as acute pancreatitis (AP) or acute recurrent pancreatitis (ARP). Nine patients who did not meet inclusion criteria were excluded, and the study was conducted with the remaining 37 cases.**

***Results:*** **Among the patients, 10 (27%) were diagnosed with ARP, while 27 (73%) presented with AP. The most common etiologies were idiopathic (n = 20, 54.1%), cholelithiasis (n = 10, 27%), and drug-induced pancreatitis (n = 7, 18.9%). Among drug-related cases, valproic acid was identified in 42.8% (3 patients), metronidazole in 28.6% (2 patients), and NSAIDs in 28.6% (2 patients). Laparoscopic cholecystectomy was performed in 5.4% (2 patients). All patients were monitored in the ward and discharged with full recovery.**

***Conclusions:*** **In our study, the increase in creatinine levels was associated with a higher risk of ARP, highlighting the importance of renal function markers in pancreatitis. Furthermore, the positive correlation between amylase, lipase, and the SIRI index with the length of hospital stay suggests that these parameters may be useful in predicting disease severity.**

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**KEYWORDS**

acute pancreatitis, acute recurrent pancreatitis, pediatric patients, pancreatitis etiology, inflammatory scores, laboratory parameters

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## INTRODUCTION

Acute pancreatitis (AP) is an acute inflammatory disease characterized primarily by pancreatic involvement and can occur across all age groups. Acute recurrent pancreatitis (ARP) is defined as two distinct episodes of AP. The interval between episodes is not clinically significant; however, pain should subside and pancreatic enzyme levels should return to normal during this period [1-3].

In children, pancreatitis generally presents as a single, uncomplicated episode of AP, though it may also manifest as ARP and has the potential to progress to chronic pancreatitis (CP) [4,5].

Although pancreatic involvement is central in AP, inflammation may extend to surrounding tissues, trigger a systemic inflammatory response, and lead to organ failure and death [1].

In the etiology of pediatric pancreatitis, idiopathic causes are the most common (33%), followed by gallstones (20%); trauma, metabolic disorders, and medications are also prominent predisposing factors [6]. In pediatric populations, ARP is thought to develop based on congenital pancreatic anomalies, genetic mutations, and autoimmune pancreatitis. ARP is considered a precursor to chronic pancreatitis (CP), and genetic factors have been particularly implicated in the progression from ARP to CP [2].

The diagnosis of pancreatitis is based on a combination of medical history, clinical findings, laboratory tests, and radiological methods [7]. In suspected cases, serum amylase and lipase levels should be evaluated. Although lipase is more sensitive and specific in pancreatitis, the shorter half-life and more rapid peak of amylase make it a valuable marker in diagnosis [8].

AP in the pediatric age group presents with different clinical features compared to adults and requires distinct diagnostic and therapeutic approaches. Although mortality rates in pediatric AP are lower than in adults, significant morbidity and complications may still occur [9, 10].

AP is increasingly observed in children, and its incidence is approaching that of the adult population [4,7]. The rising incidence of pancreatitis in children not only poses a significant health concern but also contributes to a substantial economic burden. To reduce morbidity risks such as exocrine pancreatic insufficiency, diabetes, and pancreatic cancer, clinicians should be aware of the current diagnostic and therapeutic approaches for AP and ARP and promptly refer these patients to a pediatric gastroenterologist. The aim of this study was to evaluate the relationship between laboratory parameters and inflammatory scoring systems with the etiology, clinical features, and prognosis of pediatric pancreatitis, thereby aiding in the management of these patients.

## MATERIALS AND METHODS

### Study design and setting

The study was initiated after obtaining approval from the Scientific Research Ethics Committee of Malatya Turgut Özal University, under protocol number E-3078 5963-020-315484, dated 07-16-2025. Data from pediatric patients who presented to the Emergency Department of Malatya Training and Research Hospital between January 2020 and December 2024, and who were hospitalized with a diagnosis of pancreatitis, were retrospectively analyzed.

The prognostic significance of blood parameters [complete blood count: white blood cell count (WBC), hemoglobin (HGB), hematocrit (HCT), platelet count (PLT), lymphocytes (LYM), monocytes, mean corpuscular volume (MCV), neutrophils (NEU), neutrophil percentage (NEU%) and biochemistry: urea, creatinine, aspartate aminotransferase (AST), alanine aminotransferase (ALT), amylase, lipase, albumin (Alb), glucose (GLC), sodium (Na), potassium (K), calcium (Ca)] along with inflammatory scoring systems [HALP (HGB, Alb, LYM, PLT), SIRI (Systemic Inflammatory Response Index), and SII (Systemic Immune-Inflammation Index)] was investigated. SII = (neutrophil count x platelet count)/lymphocyte count (all counts expressed in x $10^9$/L). SIRI = (neutrophil count x monocyte count) /lymphocyte count (all counts expressed in x $10^9$/L). HALP = (hemoglobin [g/L] x albumin [g/L] x lymphocyte count [x $10^9$/L]/platelet count [x $10^9$/L]). Biochemical markers were measured in our hospital's biochemistry laboratory using the About device, with commercial kits for urea, creatinine, AST, ALT, amylase, lipase, Alb, GLC, Na, K, and Ca. Hemogram parameters were analyzed in the same laboratory using the SYSMEX XN-1000 device and the following kits: Cell Pack DST (Diluent for Sysmex Technology), DCL (Detergent for Cleaning Line), WNR (White cell Nucleated Red cell), WDF (White cell Differential), and SLS Lysercell (Sodium Lauryl Sulfate).

### Selection of participants

A total of 46 patient records were identified in the Akgün information system of Malatya Training and Research Hospital between January 2020 and December 2024, based on ICD-10 diagnostic codes K85 (acute pancreatitis) and K85.9 (acute pancreatitis, unspecified). The patients' discharge summaries in the Akgün system were reviewed in detail. According to the INSPPIRE (International Study Group of Pediatric Pancreatitis: In Search for a Cure) classification, patients were categorized into two groups: acute pancreatitis (AP) and acute recurrent pancreatitis (ARP) [4]. Nine patients who did not meet the inclusion criteria were excluded from the study. The study was conducted using the data of 37 patients who met the criteria.

**Inclusion criteria**

1) Patients within the pediatric age group (< 18 years).
2) Patients who presented to the emergency department with any complaint that were diagnosed with pancreatitis in the emergency setting and were subsequently hospitalized.
3) Patients whose data were retrospectively accessible from the hospital information system and who presented to the hospital between January 2020 and December 2024.

**Exclusion criteria**

1) Patients aged 18 years or older.
2) Patients whose data could not be fully retrieved from the hospital information system.
3) Patients who were referred to other hospitals from the emergency department or who declined hospitalization and left the hospital voluntarily.

**Statistical analysis**

Statistical analyses were performed using IBM SPSS Statistics for Windows, version 27.0 (IBM Corp., Armonk, NY, USA; version 27.0). The Shapiro-Wilk test was used to assess the normality of data distribution. Descriptive statistical methods included mean, median, standard deviation, percentage [25 - 75% (interquartile range, IQR)], and frequency. For quantitative data, the Independent Samples *t*-test was used to compare two groups when the data were parametric, and one-way ANOVA was used for comparisons among three groups. For non-parametric quantitative data, the Mann-Whitney U test was used for two-group comparisons, and the Kruskal-Wallis H test for comparisons among three groups. Correlation analysis was performed between blood parameters and length of hospital stay, as well as inflammatory scores (SIRI: Systemic Inflammatory Response Index, SII: Systemic Immune-Inflammation Index, HALP: HGB-ALB-LYM-PLT). A p-value of $< 0.05$ was considered statistically significant.

## RESULTS

A total of 37 patients were included in the study. The median age was 11 years, with an interquartile range (IQR) of 6 - 14 years. Nineteen patients (51.4%) were female. Acute recurrent pancreatitis (ARP) was identified in 10 patients (27%), while 27 patients (73%) presented with a single episode of acute pancreatitis (AP). The most common etiological factors were idiopathic (n = 20, 54.1%), cholelithiasis (n = 10, 27%), and drug-induced pancreatitis (n = 7, 18.9%). Two patients (5.4%) underwent laparoscopic cholecystectomy. All patients were followed up in the inpatient ward and discharged after full recovery; no post-discharge follow-up was performed. Patients were advised to return to the emergency department in case of any complications, and no re-admissions were recorded in the hospital discharge summaries. The median length of hospital stay was 4 days (IQR: 3 - 7).

Drug-induced acute pancreatitis was observed in seven patients. Among these, valproic acid use was identified in three patients (42.8%), while metronidazole and NSAIDs were each used in two patients (28.6%).

The mean and standard deviation (SD) values of the parametric blood parameters of the patients are given in Table 1.

Median and 25% - 75% (IQR) values of non-parametrically distributed parameters of the patients are given in Table 2. An Independent Samples *t*-test was performed to evaluate the relationship between pancreatitis recurrence and HGB, NEU%, PLT, and ALB levels. The corresponding p-values are presented in Table 3.

A Mann-Whitney U test was conducted to determine whether there was a significant relationship between pancreatitis recurrence and the following variables: age, creatinine, AST, ALT, amylase, lipase, NEU, LYM, monocyte count, SIRI and SII indices, HALP score, and length of hospital stay. The corresponding p-values are shown in Table 4.

A one-way ANOVA test was conducted to evaluate the relationship between pancreatitis etiology (idiopathic, drug-induced, and stone-related) and clinical as well as parametric laboratory data. No statistically significant differences were observed between the groups. Although albumin (ALB) did not reach statistical significance in the ANOVA test ($p = 0.110$), the LSD post-hoc test revealed a near-significant difference between the idiopathic and stone-related groups ($p = 0.043$), while the Tukey test showed no significant difference. For all other parameters, post-hoc comparisons revealed no significant differences among the groups ($p > 0.05$).

A one-way Kruskal-Wallis H test was applied to evaluate whether there was a significant relationship between pancreatitis etiology (idiopathic, drug-induced, and stone-related) and clinical as well as non-parametric laboratory variables. AST and ALT levels showed significant differences among the groups ($p = 0.001$ and $p = 0.002$, respectively), with markedly higher values observed in the stone-related pancreatitis group. No significant differences were found among the groups regarding age, glucose (GLC), urea, amylase, lipase, WBC, NEU, lymphocytes (LYMP), monocytes, MCV, length of hospital stay, SIRI and SII indices, or HALP score ($p > 0.05$). Creatinine levels showed a borderline, statistically significant difference among etiologic groups ($p = 0.05$), with the idiopathic pancreatitis group exhibiting a higher mean rank compared to the other groups.

A moderate positive correlation was found between the length of hospital stay and amylase ($r = 0.342$, $p = 0.038$), lipase ($r = 0.364$, $p = 0.027$), and the SIRI index ($r = 0.381$, $p = 0.020$) in our patients. Correlation values between length of stay and amylase, lipase, SIRI-SII indices, and HALP score are presented in Table 5.

**Table 1. Mean and standard deviation values of hematological and biochemical parameters.**

| Parameters | Reference ranges | n | Mean | ± SD |
|---|---|---|---|---|
| HGB (g/dL) | 12.2 - 18.1 | 37 | 13.9 | 1.7 |
| HTC (%) | 33.7 - 57.7 | 37 | 41.7 | 4.8 |
| NEU % (%) | 2 - 6.9 | 37 | 69.3 | 16.1 |
| PLT ($10^3$/µL) | 142 - 424 | 37 | 368 | 88.9 |
| ALB (g/dL) | 35 - 55 | 37 | 4.2 | 0.3 |
| Na (mmol/L) | 136 - 148 | 37 | 138.2 | 3.1 |
| Ca (mg/ dL) | 8.4 - 10.6 | 37 | 9.5 | 0.4 |

**HGB: hemoglobin, HTC: hematocrit, NEU %: neutrophil %, PLT: platelet, ALB: albumin, NA: sodium, Ca: calcium.**

**Table 2. Median and 25% - 75% (IQR) values of demographic characteristics, hematological, biochemical, and inflammatory score parameters.**

| Parameters | Reference ranges | n | Median | IQR | |
|---|---|---|---|---|---|
| | | | | 25% | 75% |
| Age (years) | - | 37 | 11 | 6 | 14 |
| WBC ($10^3$/µL) | 4.6 - 10.2 | 37 | 10.4 | 8 | 14.8 |
| NEU ($10^9$L) | 2 - 6.9 | 37 | 7.2 | 4.3 | 13.9 |
| LYM ($10^9$L) | 0.6 - 3.4 | 37 | 1.6 | 1.3 | 3.1 |
| Monocyte ($10^9$L) | 0 - 0.9 | 37 | 0.6 | 0.4 | 0.8 |
| MCV (fL) | 80 - 97 | 37 | 81.5 | 80 | 85.5 |
| GLC (mg/dL) | 70 - 105 | 37 | 106 | 87.5 | 124 |
| Urea (mg/dL) | 15 - 45 | 37 | 22.9 | 18.5 | 30.1 |
| Creatinine (mg/dL) | 0.5 - 1.1 | 37 | 0.5 | 0.4 | 0.6 |
| AST (U/L) | 0 - 35 | 37 | 35 | 25 | 57 |
| ALT (U/L) | 0 - 35 | 37 | 21 | 14 | 51 |
| Amylase (U/L) | 20 - 120 | 37 | 668 | 35 | 1,343 |
| Lipase (U/L) | 0 - 70 | 37 | 787 | 325 | 1,190 |
| K (mmol/L) | 3.5 - 5.2 | 37 | 4.2 | 3.8 | 4.4 |
| LHS (days) | - | 37 | 4 | 3 | 7 |
| SIRI | - | 37 | 1.9 | 1.2 | 6.6 |
| SII | - | 37 | 983.1 | 561.8 | 2,710.9 |
| HALP | - | 37 | 3.9 | 2.5 | 5.6 |

**WBC: leukocytes, NEU: neutrophil, LYM: lymphocyte, MCV: mean corpuscular volume, GLC: glucose, AST: aspartate aminotransferase, ALT: alanine aminotransferase, K: potassium, LHS: length of hospital stay, SIRI: Systemic Inflammatory Response Index, SII: Systemic Immune-Inflammation Index, HALP: HGB-ALB-LYM-PLT Score.**

## DISCUSSION

Pediatric pancreatitis - particularly ARP - is characterized by frequent emergency department visits and a high rate of hospital admissions. In addition, the need for invasive procedures such as endoscopy and surgical interventions is common. Consequently, pediatric pancreatitis represents a significant disease burden for both children and their families [11]. It has also been reported that both AP and ARP may be associated with exocrine and endocrine pancreatic insufficiency, contributing to short- and long-term morbidity [12].

Pediatric ARP is a relatively rare condition, with studies reporting that it develops in 9% - 35% of children with

**Table 3. Relationship between recurrent pancreatitis and normally distributed hematological and biochemical markers.**

| Parameters | Recurrence | n | p-value |
|---|---|---|---|
| HGB (g/dL) | present | 10 | 0.268 * |
| | absent | 27 | |
| NEU % (%) | present | 10 | 0.256 * |
| | absent | 27 | |
| PLT ($10^3$/µL) | present | 10 | 0.744 * |
| | absent | 27 | |
| ALB (g/dL) | present | 10 | 0.546 * |
| | absent | 27 | |

*** Independent samples *t*-test.**
**p < 0.05 was considered statistically significant.**
**HGB: hemoglobin, NEU %: neutrophil %, PLT: platelet, ALB: albumin.**

**Table 4. Association between recurrent pancreatitis and demographic, hematological, biochemical, and inflammatory score parameters with non-parametric distribution.**

| Parameters | Recurrence | n | p-value |
|---|---|---|---|
| Age (years) | present | 10 | 0.243 * |
| | absent | 27 | |
| Creatinine (mg/dL) | present | 10 | 0.042 * |
| | absent | 27 | |
| AST (U/L) | present | 10 | 0.472 * |
| | absent | 27 | |
| ALT (U/L) | present | 10 | 0.483 * |
| | absent | 27 | |
| Amylase (U/L) | present | 10 | 0.321 * |
| | absent | 27 | |
| Lipase (U/L) | present | 10 | 0.538 * |
| | absent | 27 | |
| NEU (µL) | present | 10 | 0.516 * |
| | absent | 27 | |
| LYM (µL) | present | 10 | 0.087 * |
| | absent | 27 | |
| Monocyte (µL) | present | 10 | 0.758 * |
| | absent | 27 | |
| SIRI | present | 10 | 0.274 * |
| | absent | 27 | |
| SII | present | 10 | 0.171 * |
| | absent | 27 | |
| HALP | present | 10 | 0.108 * |
| | absent | 27 | |
| LHS (days) | present | 10 | 0.727 * |
| | absent | 27 | |

*** Mann Whitney U test.**
**p < 0.05 was considered statistically significant.**
**AST: aspartate aminotransferase, ALT: alanine aminotransferase, NEU: neutrophil, LYM: lymphocyte, SIRI: Systemic Inflammatory Response Index, SII: Systemic Immune-Inflammation Index, HALP: HGB-ALB-LYM-PLT, LHS: length of hospital stay.**

**Table 5. Correlation between length of hospital stay and serum amylase, lipase, SIRI, SII, and HALP scores in hospitalized patients.**

| Parameter | | n | r | p |
|---|---|---|---|---|
| Amylase (U/L) | length of hospital stay (days) | 37 | 0.342 * | 0.038 |
| Lipase (U/L) | | 37 | 0.364 * | 0.027 |
| SIRI | | 37 | 0.381 * | 0.020 |
| SII | | 37 | 0.268 | 0.109 |
| HALP | | 37 | 0.175 | 0.299 |

*** Correlation is significant at the 0.05 level (two-tailed).**
**p < 0.05 was considered statistically significant.**
**SIRI: Systemic Inflammatory Response Index, SII: Systemic Immune-Inflammation Index, HALP: HGB-ALB-LYM-PLT.**

AP [13,14]. In a retrospective study by Smolka et al. involving 55 pediatric patients diagnosed with acute pancreatitis, the most common etiological factors were idiopathic causes (39%) and gallbladder pathologies (31%). The same study highlighted that children with idiopathic AP exhibited a higher rate of comorbidities and were more likely to develop ARP [15]. In another study by Alnagar et al., 118 pediatric patients with acute pancreatitis were evaluated. The leading causes of AP were again idiopathic (50.8%) and gallbladder-related (23.8%), whereas hereditary pancreatitis (42.9%) was identified as the most common cause of ARP. Approximately 10% of the patients required treatment due to complications or underlying gallbladder-related pathology [16]. In the present study, the most frequent etiological factors for AP were idiopathic causes (54.1%), cholelithiasis (27%), and medications (18.9%). Two patients (5.4%) underwent laparoscopic cholecystectomy. Our findings indicate that idiopathic and gallbladder-related etiologies are the leading causes of pediatric AP, consistent with the existing literature. The high proportion of idiopathic cases suggests that yet unidentified genetic or environmental factors may play a role. The need for surgical intervention due to gallbladder pathology further emphasizes the importance of clarifying the etiology in clinical management.

Drug-induced pancreatitis is defined by the resolution of pancreatitis upon discontinuation of the suspected drug and recurrence upon re-exposure [17]. Drugs are implicated in approximately 5% of AP cases, and most studies examining the association between medications and pancreatitis are based on case series [18]. Although numerous drugs have been reported, the evidence linking them to pancreatitis remains limited. The most commonly proposed mechanisms include the direct toxic effects of the drug, or the accumulation of toxic metabolites or intermediate compounds [19]. In a case-control study conducted in Sweden, Barbulescu et al. reported an increased risk of acute pancreatitis within 30 days following the use of oral metronidazole [20]. Bischof et al., in a study involving 125 patients (83 children), found a correlation between long-term valproic acid therapy and acute pancreatitis. They noted that valproic acid-associated pancreatitis may occur at any point during treatment and carries a high risk of mortality [21]. The current findings revealed that drug-induced acute pancreatitis was observed in seven patients: valproic acid was used in three patients (42.8%), while metronidazole and NSAIDs were each used in two patients (28.6%). These findings are consistent with the mechanisms described in the literature and suggest that agents such as valproic acid should be closely monitored due to their potential for high mortality and recurrence risk. Our findings demonstrated that there was a significant relationship between ARP and laboratory parameters as well as inflammatory scoring systems. Elevated creatinine levels were found to be significantly associated with the development of ARP, with the risk of recurrence increasing in parallel with higher creatinine levels. Recent studies have also supported the prognostic relevance of serum creatinine in pediatric acute pancreatitis. Szabo et al. identified elevated creatinine as a risk factor for the development of severe AP and ARP [22]. A comprehensive meta-analysis published in 2022 reported that an increase in the creatinine/BUN ratio is among the predictors of severe AP in the pediatric population [23]. Our findings are supported by the literature, and the association between ARP and creatinine may be attributed to the disruption of renal microcirculation secondary to the activation of the inflammatory cascade following the systemic leakage of pancreatic enzymes. Similarly, a study based on computed tomography imaging emphasized that elevated creatinine levels in pediatric AP patients are associated with more severe clinical progression [24]. These findings reinforce the association between creatinine and ARP observed in our study and suggest that routine monitoring of serum creatinine should be integrated into pediatric AP management algorithms.

Yildiz et al. reported that SII and SIRI scores are useful markers for predicting the severity of pancreatitis in adult AP patients [25]. Similarly, Liu et al., in their study involving 101 adult AP patients, found that the SII score was associated with both disease severity and

recurrence [26]. Güler et al. concluded that the HALP score may be used to predict disease severity and short-term mortality in adults diagnosed with AP [27]. The incidence of AP, ARP, and severe AP is lower in children compared to adults [12].

In the literature, hematological and biochemical parameters such as anemia, thrombocytosis, neutrophilia, lymphopenia, and hypoalbuminemia have been associated with the prognosis of acute pancreatitis. A study conducted in China reported that adult AP patients with anemia experienced a more severe disease course [28]. Likewise, a multicenter study from Hungary emphasized that hypoalbuminemia was linked to increased mortality and complications [29]. Qi et al., in a study of 204 patients, demonstrated a clear association between lymphocyte percentage and AP prognosis, showing lower lymphocyte levels in severe AP cases [30]. A large-scale analysis from South Korea indicated that elevated neutrophil count and the neutrophil-to-lymphocyte ratio (NLR) are significant predictors of AP severity [31]. Another study from Japan found that patients with thrombocytosis were at higher risk for local pancreatic complications [32]. Although inflammatory scores such as SII, SIRI, and HALP have emerged as prognostic markers in adult AP, studies evaluating these scores in pediatric patients are limited, largely due to small sample sizes. No significant association was found between the development of ARP and SII, SIRI, or HALP scores, nor with their individual components: HGB, PLT, NEU, LYM, and ALB. The discrepancy between our findings and previous reports may be explained by physiological and immunological differences in the pediatric population, the lower incidence of ARP in children, and the limited sample size of our cohort. Our results suggest that these biomarkers should be interpreted with caution in pediatric populations, and that further validation through large-scale prospective studies is warranted.

Our investigation aimed to determine whether there was a significant relationship between the etiology of pancreatitis and variables such as age, laboratory findings, and inflammatory scores. AST and ALT levels were found to be markedly elevated in the stone-related pancreatitis group. Similar to our findings, Yayla et al. also reported elevated AST and ALT levels in patients who developed pancreatitis secondary to biliary tract pathologies [33]. It is well known that biliary obstruction can affect the liver and result in hepatocellular injury, leading to increased AST and ALT levels. We believe that AST and ALT elevation reflects secondary hepatic involvement occurring concurrently with pancreatitis. Another notable finding in our study was that the idiopathic pancreatitis group exhibited higher mean rank creatinine levels compared to the other etiologic groups. In pancreatitis, pancreatic enzymes within acinar cells become prematurely activated. This early activation leads to autolysis of the pancreas and surrounding tissues, initiating a cascade of events that contribute to renal injury. Among these are the systemic release of active enzymes, proteases, and cytokines, as well as increased production of reactive oxygen species [34]. Our findings suggest that, in addition to systemic inflammatory responses caused by autolysis, potential genetic susceptibility in the idiopathic pancreatitis group may also influence renal function. These findings suggest that serum creatinine levels may serve as a useful marker in early triage and in the monitoring of protocols for pediatric pancreatitis. Early measurement of serum creatinine may help predict disease severity and facilitate the early identification of high-risk patients.

In our patients, a moderate positive correlation was observed between length of hospital stay and amylase, lipase, and the SIRI index. The findings of our study are consistent with a prospective study conducted in Vietnam involving 207 adult AP patients, which reported a significant association between SIRI and severe pancreatitis, as well as a positive correlation between SIRI and hospital stay duration [35]. Similarly, a retrospective analysis of 201 patients demonstrated that elevated SIRI levels were strongly correlated with severe pancreatitis and prolonged hospitalization, reporting a sensitivity of 83.8% and a specificity of 80% at a cutoff value of 4.83 [25]. These results indicate that amylase, lipase, and SIRI are likely associated with disease severity and may have potential value in the clinical monitoring of pediatric AP patients. Additionally, our findings support the notion that SIRI, as a reflection of systemic inflammation, may serve as a more reliable predictor of disease severity.

Our study has several limitations. It was conducted at a single center, and the number of cases was relatively small, which may limit the generalizability of our findings. In addition, genetic analyses were not performed, and long-term follow-up data were unavailable. These factors, together with the potential bias inherent to a single-center design, should be considered when interpreting the results. Multicenter studies with larger sample sizes are needed to more accurately and comprehensively assess the prognostic value of blood parameters and inflammatory scoring systems in pediatric pancreatitis patients.

## CONCLUSION

In this study, the relationship between etiology, blood parameters, and inflammatory scoring systems with prognosis was investigated in a pediatric pancreatitis patient group. The significant association between creatinine levels and the development of ARP highlights the importance of renal function markers. The positive correlation between amylase, lipase, and the SIRI index with length of hospital stay suggests that these parameters may be useful in predicting disease severity. However, no significant association was found between inflammatory scores and ARP.

Our findings indicate that these biomarkers should be interpreted with caution in pediatric pancreatitis patients

and underscore the need for further validation through larger, multicenter studies.

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**Informed Consent:**
This study was conducted retrospectively, and all patient data were expressed in numerical form. As there was no identifiable information included, there was no risk to patient confidentiality, and the requirement for informed consent was waived.

**Ethical Approval Statement:**
Ethical approval for this study was obtained from Malatya Turgut Özal University Health Sciences Scientific Research Ethics Committee on July 16, 2025 (protocol no.: E-30785963-020-315484).

**Declaration of Generative AI in Scientific Writing**:
During the preparation of this manuscript, no generative artificial intelligence (AI) tools were used for writing, editing, data analysis, or figure creation. All content was produced entirely by the authors.

**Declaration of Interest:**
The authors declare that there is no conflict of interest.

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