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Original Article

Analysis of Pancreatitis Severity Scores and hospitalization length of Diabetic and Non-diabetic Patients with Nonbiliary Acute Pancreatitis

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ABSTRACT

Objective: Many studies have compared scoring systems in the course of acute pancreatitis (AP), but comparative analyses of scoring systems in patients with diabetes are limited. In our study, we aimed to compare patients using more than one scoring system and also to investigate whether there was a scoring system that could be preferred in predicting the length of hospital stay (LOS) in individuals with diabetes.

Methods: Mild and moderate-severe acute pancreatitis patients who were followed up with AP in the internal medicine clinic were evaluated retrospectively. The diagnosis of AP was confirmed in accordance with the revised Atlanta criteria. AP with mild and moderate severity was the inclusion criteria. Patients with severe pancreatitis were excluded. Patients with and without diabetes were analyzed according to demographic characteristics, laboratory and imaging findings in two groups. Ranson, Systemic Inflammatory Response Syndrome (SIRS), Bedside Index of Severity in Acute Pancreatitis (BISAP), Modified Glasgow II Scoring (IMRIE), Harmless Acute Pancreatitis Score (HAPS), Balthazar, and Computed Tomography Severity Index (CTSI) scores were calculated on admission.

Results: AP patients with diabetes had higher serum triglyceride, leukocyte, CRP, and procalcitonin levels ($p<0.05$). Serum amylase levels were slightly higher in non-diabetic patients ($p<0.05$). The presence of diabetes was positively correlated with Ranson on admission, SIRS, and Imrie scores ($p<0.05$; $r=0.437$; $r=0.274$; $r=0.317$). Among severity scores, only the CTSI score was significantly higher in patients with >7 days LOS ($p<0.004$). In addition, while there was no difference in LOS according to the presence of DM ($p=0.840$), mean HbA1c values were higher in patients with longer LOS ($p=0.037$). As a result of regression analysis, male gender and higher CTSI scores were related to increased LOS (OR=0.266, $p=0.037$ vs OR=1.579, $p=0.022$).

Conclusion: Among the scoring systems, IMRIE, SIRS, and Ranson scores were higher in mild-moderate AP patients with diabetes compared to non-diabetic patients. In addition, male gender and higher CTSI scores were associated with increased LOS in this specific patient group.

INTRODUCTION

Acute pancreatitis (AP) is an acute inflammatory process of the pancreas, characterized by abdominal pain and elevated pancreatic enzyme levels in the blood. The most common causes of AP are alcohol, hypertriglyceridemia, hypercalcemia, drug-related, autoimmune disease, and genetic and anatomic anomalies.[1] According to the revised Atlanta criteria, acute pancreatitis is examined histopathologically in three groups as interstitial, edematous, and acute necrotizing types, and in three groups as mild, moderate, and severe acute pancreatitis according to the severity of the disease. Local or systemic complications and organ failure are not seen in mild acute pancreatitis. In moderate acute pancreatitis, there is transient organ failure that resolves within 48 hours and/or local-systemic complications that do not continue for more than 48 hours, whereas in severe acute pancreatitis, there is permanent failure involving one or more organs.[2] Many scoring systems have been developed, consisting of physical examination findings, laboratory, and imaging methods to evaluate the severity of acute pancreatitis and its complications. The Ranson

criteria,[3] Acute Physiology and Chronic Health Inquiry (APACHE II) scoring,[4] and Bedside Index of Severity in Acute Pancreatitis (BISAP) scoring, which also includes the Systemic Inflammatory Response Syndrome (SIRS) criteria, are the widely used AP scoring systems today.[5] In addition, Modified Glasgow II Scoring (IMRIE) is a one-time scoring at the 48th hour after the patient's admission to the hospital.[6]

Due to the complexity of the existing scoring systems, the Harmless Acute Pancreatitis Score (HAPS) has been developed, which evaluates both physical examination findings and hematocrit (HCT) and creatinine values at admission.[7] The Balthazar score was developed based on computed tomography (CT) imaging findings and is frequently used in the diagnosis and evaluation of complications of AP.[8] In addition, Computerized Tomography Severity Score (CTSI) scoring can be performed by adding the necrosis rate on CT to the Balthazar score, and it has been shown that it has high diagnostic accuracy in the evaluation of severe acute pancreatitis and can be used reliably in the early prediction of complications.[9] However, none of these scoring systems alone is sufficient to assess prognosis.

Diabetes mellitus (DM), a chronic metabolic disorder, is a rapidly growing global problem with major social, health, and economic consequences. DM causes the development of many complications, both acute and chronic, and is also known to be an important risk factor for many other diseases.[10] High glucose levels in patients with diabetes are suggested to induce oxidative stress in the pancreas as well as in various tissues of the body.[11] In addition, comorbid factors such as obesity and hypertriglyceridemia have also been associated with acute pancreatitis.[12,13] However, the number of studies comparing AP scoring systems in diabetics and non-diabetics is limited. In our study, we aimed to compare the pancreatic scoring systems in mild-moderate acute pancreatitis patients with and without T2DM and factors effective on the length of hospital stay (LOS) in this specific patient group.

MATERIALS AND METHODS

In our study, patients who were followed up with the diagnosis of AP in the internal medicine inpatient clinic between January 2018 and 2021 were evaluated retrospectively. The diagnosis of AP in these patients was confirmed by demonstrating the presence of two of the three basic criteria in accordance with the revised Atlanta criteria: typical abdominal pain in terms of pancreatitis, an increase in blood levels of amylase or lipase more than three times the upper limit, and significant imaging findings suggesting pancreatitis.

Patients with mild and moderate acute pancreatitis aged over 18 years who were not pregnant and were followed up for at least 48 hours in the internal medicine inpatient clinic were included in our study. Severe acute pancreatitis patients were excluded due to ICU follow-up. Patients diagnosed as having biliary pancreatitis in imaging methods, patients with a hospitalization period of under 2 days, patients without CT imaging during hospitalization, and patients diagnosed as having chronic pancreatitis were excluded. In addition, patients with severe acute pancreatitis were excluded from the study. Mild acute pancreatitis was defined for patients that had no concomitant organ failure and no local or systemic complications, and their Ranson, BISAP, and Imrie scores were <3. Moderate acute pancreatitis was characterized by transient organ failure (less than 48 hours) or the presence of local or systemic complications, and Ranson, BISAP, and Imrie scores ≥3. Severe acute pancreatitis was defined as persistent organ failure lasting longer than 48 hours.

Demographic characteristics, smoking status, alcohol use, comorbid diseases, and drug use of the patients were recorded. Laboratory parameters such as blood glucose, blood gases, hemoglobin, hematocrit, albumin, blood urea nitrogen (BUN), calcium, magnesium, amylase, lipase, thyroid-stimulating hormone (TSH), C-reactive protein (CRP), procalcitonin (PCT), total cholesterol, high-density lipoprotein (HDL) cholesterol, low-density lipoprotein (LDL) cholesterol, triglycerides, glycated hemoglobin (HbA1c), and leukocyte counts were recorded. CT imaging findings and length of stay were analyzed. Ranson, SIRS, BISAP, Imrie, HAPS, Balthazar, and CTSI scores at admission were calculated according to the previously described formula.[11] All parameters were compared between patients with and without diabetes. The study was approved by Kartal Dr. Lütfi Kırdar City Hospital Ethics Committee (date/number: 14.04.2021, 2021/514/199/2).

Statistical Analyses

Statistical analysis was performed using the SPSS 25.0 (Statistical Package for the Social Sciences) program. Descriptive statistics (mean, standard deviation, median, minimum, maximum, percentage values) of the data were calculated. Student's t-test was used to compare parameters between groups of normally distributed quantitative data. Mann-Whitney U test was used for comparison of non-normally distributed parameters between groups. The Chi-square (χ^2) test was used for comparisons of qualitative data. Linear regression analysis was performed to analyze the relationship between the presence of diabetes and the scoring systems. The results were evaluated with a statistical significance of $p<0.05$ at the 95% confidence interval.

RESULTS

A total of 100 patients with acute pancreatitis were enrolled in the study. Among 100 patients, 51 had DM, and 49 patients did not have diabetes. Patients with diabetes were older and had higher BMI, systolic blood pressure, and comorbidities ($p<0.05$). Patients with and without diabetes were similar in terms of sex, alcohol use, and smoking history ($p>0.05$). As expected, patients with diabetes had higher fasting blood glucose (FBG) and HbA1c ($p<0.05$). Similarly, acute pancreatitis patients with dia-

betes had higher serum triglyceride, leukocyte, CRP, and procalcitonin levels (p<0.05). Serum amylase levels were slightly higher in non-diabetic patients (p<0.05) (Table 1).

We compared the scoring results of acute pancreatitis patients according to the presence of diabetes in Table 2. Ranson 0-hour scores, SIRS, BISAP, and Imrie scores were significantly higher in diabetes (p<0.05 for all). HAPS, Balthazar, and CTSI scores were similar in diabetics and non-diabetics (p>0.05 for all).

Among severity scores, only the CTSI score is significantly higher in patients with >7 days LOS (p<0.004). In addition, while there is no difference in LOS according to the presence of DM (p=0.840), mean HbA1c values were higher in patients with a longer duration of hospitalization (p=0.037). Male patients had a higher hospitalization duration (p=0.026). Serum triglyceride values are higher in patients with longer LOS (p=0.004) (Table 3).

We performed binary logistic regression analysis regarding the effective factors on LOS in patients with mild and moderate severity AP (Table 4). As a result of regression analysis, male sex and higher CTSI score are related to the increased LOS (OR=0.266, p=0.037 vs. OR=1.579, p=0.022).

Table 1. Demographic, laboratory, and clinical characteristics of patients according to the presence of T2DM

	Non-diabetics n=49	Diabetics n=51	p value
Age (years)	54±17.52	61±15.12	0.016
Male, n (%)	26 (53.06)	25 (49.01)	0.843
BMI (kg/m2)	28±4.59	31±5.33	0.002
Alcohol use, n (%)	8 (16.32)	5 (9.80)	0.371
Smoking history, n (%)	16 (32.65)	11 (21.56)	0.261
Clinical			
Fever (°C)	37±0.48	37±0.44	0.315
Pulse (rate/m)	84±11.42	82±14.96	0.293
Respiration Rate	17±2.65	18±3.18	0.059
Oxygen Saturation	97±2.65	96±2.62	0.149
SBP (mmHg)	125±15.12	132±18.00	0.011
DBP (mmHg)	77±11.07	75±9.86	0.449
LOS (days)	7±4.42	7±3.28	0.627
Co-morbidities (n/%)	15 (30.61)	33 (64.70)	0.001
Laboratory findings			
FBG (mg/dl)	130.33±50.10	246.88±137.72	0.001
HbA1C (%)	5.69±0.45	8.02±2.15	0.001
T.Cholesterol (mg/dL)	180.80±50.91	251.43±78.49	0.096
LDL- C (mg/dL)	116.19±42.31	115.52±44.53	0.952
HDL-C (mg/dL)	41.49±14.94	51.79±45.58	0.984
TG (mg/dL)	132.63±98.55	534.74±375.61	0.001
TSH (mIU/L)	1.44±1.19	1.49±1.42	0.673
Leukocytes (µl)	11309±4151,69	13592±5250,45	0.011
CRP (mg/l)	88.43±89.82	128.92±97,26	0.031
Pct (µg/l)	1.82±4.99	2.37±4.41	0.003
AST (IU/l)	115.84±182.92	131.94±199.58	0.87
LDH (U/l)	290.86±158.74	335.57±254.67	0.388
Albumin (g/dl)	3.79±0.53	3.98±0,45	0.061
BUN (mg/dl)	15.50±8.27	18.89±10.74	0,055
Calcium (mg/dl)	9.03±0.65	9.05±0.71	0.859
Magnesium (mg/ml)	1.86±0.12	1.83±0.19	0.172
Amylase (U/l)	1899.33±1202.20	1506.25±1228.52	0.048
Lipase (U/l)	1250.29±1133.16	996.05±382.38	0.711

Statistical significance: p<0.05. Abbreviations; DM: diabetes mellitus; BMI: Body mass index; SBP: systolic blood pressure; DPB: diastolic blood pressure; LOS: Length of hospital stay; FBG: Fasting blood glucose; T. Cholesterol: total cholesterol; LDL-C: low density lipoprotein cholesterol; HDL-C: high density lipoprotein cholesterol; TG: triglycerides; TSH: thyroid stimulating hormone; AST: Aspartate transaminase; BUN: Blood urea nitrogen; CRP: C-Reactive Protein; Hba1c: Hemoglobin A1c; LDH: Serum lactate dehydrogenase; Pct: Procalcitonin; TSH: Thyroid Stimulating hormone.

Table 2. Comparison of scoring systems according to the presence of T2DM

	Non-DM n=49	DM n=51	p-value
Ranson-0.hour	1.04±0.98	2.04±1.09	0.001
SIRS	0.53±0.76	0.98±0.84	0.004
BISAP	0.78±1.12	1.10±1.01	0.028
IMRIE	1.43±1.20	2.27±1.34	0.001
HAPS	0.78±0.67	0.78±0.73	0.936
Balthazar	1.57±1.30	2.04±1.33	0.087
CTSI	1.96±2.05	2.29±1.66	0.253

BISAP: Bedside Index for Severity in Acute Pancreatitis; CTSI: Computed Tomography Severity Index; HAPS: Harmless Acute Pancreatitis Score; SIRS: Systemic inflammatory response syndrome.

DISCUSSION

Acute pancreatitis (AP) is one of the common emergencies that can result in morbidity and mortality. There are various results on the etiology, severity, complications, and mortality rates of AP.[14] Although scoring systems have been developed to estimate the severity of the disease, no single scoring system gives the best results, and each has limitations in different aspects.[15] For this reason, different scoring systems based on comorbidities and AP severity have been preferred. Diabetes has special importance in the patient group with AP due to its increasing frequency. In our study, we evaluated the differences in scoring systems in showing the severity of AP in patients with and without diabetes, as well as the effective factors on LOS.

Patients with diabetes have an increased risk of acute

Table 3. Laboratory parameters and acute pancreatitis severity scores according to the length of hospital stay

	LOS > 7days n=41	LOS < 7days n=59	p value
Age (years)	58.20±17.89	56.74±15.97	0.255
Gender (male) n (%)	26 (63.41)	25 (42.37)	0.026
BMI (kg/m^2)	28.52±17.89	29.70±5.63	0.052
DM n (%)	20 (48.78)	31 (52.54)	0.840
FBG (mg/dl)	196.34±110.15	183.41±124.55	0.592
HbA1c %	7.05±2.30	6.71±1.74	0.037
BUN (mg/dl)	18.46±9.76	16.33±9.62	0.611
CRP (mg/l)	125.04±101.87	97.40±100.75	0.579
Procalcitonin (ng/ml)	2.08±5.61	2.11±5.65	0.982
Amylase (U/l)	1924.66±1243.49	1553.67±1200.28	0.317
Lipase (U/l)	1035.75±1046.63	1180.82±1197.66	0.443
Triglycerides (mg/dl)	309.54±519.44	215.61±301.77	0.004
RANSON	1.56±1.14	1.52±1.16	0.924
SIRS	0.78±0.72	0.74±0.89	0.051
BISAP	1.05±1.11	0.87±1.04	0.793
IMRIE	2.00±1.34	1.75±1.33	0.865
HAPS	0.83±0.66	0.75±0.72	0.233
CTSI	2.80±2.29	1.70±1.30	0.004
Baltazar	2.07±1.36	1.62±1.28	0.815

LOS: length of stay; BMI: body mass index; FBG: fasting blood glucose; BUN: Blood urea nitrogen; CRP: C-reactive protein; SIRS: Systemic Inflammatory Response Syndrome; BISAP: Bedside Index of Severity in Acute Pancreatitis; IMRIE: Modified Glasgow II Scoring; HAPS: Harmless Acute Pancreatitis Score; CTSI: Computerized Tomography Severity Score.

Table 4. Binary Logistic regression analysis for effective factor on LOS in mild-moderate AP patients

				95% C.I. for EXP (B)	
	B	p	O.R.	Lower	Upper
Gender (Male)	1.326	0.037	0.266	0.076	0.924
HbA1c %	-0.140	0.946	0.986	0.658	1.477
Triglycerides	0.001	0.610	1.000	0.999	1.002
CTSI	0.457	0.022	1.579	1.068	2.333

OR: odds ratio; CI: confidence interval; CTSI: computerized tomography severity score; AP: acute pancreatitis; LOS: length of stay. Statistical significance at p<0.05.

pancreatitis.[16] However, conflicting results have been reported on the hospital mortality risk of patients with diabetes with AP. A retrospective study in Taiwan showed that patients with AP and DM had a lower risk of hospital mortality.[17] In a study by Zhao et al.,[18] patients with AP with a previous history of DM or HbA1c levels higher than 6.5% had higher mortality than those without DM. In our study, patients with AP and DM had significantly higher blood glucose levels at admission than those without DM. In addition, the average HbA1c value of patients with diabetes was 8.02%. The mean LOS was 6.65±3.88 days in our study. In a study published by Ertaş et al.,[19] the hospitalization periods of individuals with edematous and necrotizing pancreatitis were 6.7±4.5 and 6.2±5.3 days, respectively, similar to our findings. On the other hand, our study revealed that patients with diabetes had higher scores in acute pancreatitis severity scores. However, there was no difference between the groups with and without diabetes in terms of LOS. Regression analysis showed that higher CTSI scores and male gender were related to the length of hospital stay longer than seven days. While BISAP and PANC3 scores have been suggested for early prediction of LOS,[20] there are limited data regarding the utility of prognostic severity scores for predicting LOS.

Hyperglycemia is a common early feature of AP and is used in prognostic scoring systems. In our current study, we found that the presence of diabetes in patients with AP was related to SIRS as well as being related to Ranson and Imrie scores. Although the extent to which pre-existing DM may increase the severity of AP has yet to be determined, there is an association between stress hyperglycemia and adverse outcomes. The association between hyperglycemia and poor functional outcomes in critically ill patients has been demonstrated. In the ICU, hyperglycemia is strongly associated with outcomes in patients without pre-existing DM, but it is not associated with outcomes in patients with pre-existing DM.[21]

In a study by Buter et al.[22] in 2002 with a group of 121 patients, both organ dysfunction and SIRS scoring were associated with increased mortality. It was observed that early organ dysfunction generally improved and had no significant effect on mortality by itself, whereas worsening organ dysfunction was associated with mortality in more than half of the patients.[22] In our study, we showed that patients with diabetes scored higher in SIRS scoring. This may be due to the mild and moderate AP profile of the patients included in the study and the higher leukocyte count in patients with diabetes.

We observed that the Ranson score at admission was higher in diabetic patients. This may be due to the presence of blood glucose levels in scoring. The inability to calculate 48th-hour Ranson scores due to data insufficiency affects the reliability of the findings. However, the meta-analysis by De Bernardis et al.[23] published in 1999 on 211 studies conducted since 1974 showed that the Ranson criteria had a weak power to predict findings. In BISAP scoring, patients with diabetes scored higher than those without diabetes, but despite this significant difference, both patient groups are in the scoring range with low expected mortality. The meta-analysis by Gao et al.[24] of 10 studies, which was conducted between 1980 and 2014 and published in 2015, focused on the predictive value of BISAP scores to evaluate the clinical outcomes of AP. It was shown that the cut-off value of ≥3 points had moderate sensitivity and high specificity to predict mortality and severe AP. At the cut-off value of ≥2 points, it was observed that although the sensitivity increased for both results, the specificity decreased. It was suggested that a BISAP score of ≥3 was successful in predicting the mortality and severity of AP.[24] However, in our study, when 3 points and above were considered as the cut-off value, no difference was observed in patients with diabetes. This may be a result of the low number of the study group.

Imrie scores were higher in patients with diabetes when 3 or more points were considered as the cut-off value in the scoring. The reason for this may be that leukocyte counts and glucose levels occur together in Imrie scoring. On the other hand, no difference was observed in the patient groups in terms of HAPS, Balthazar, and CTSI scores. In the study of Lankisch et al.,[25] which included 394 patients, it was shown that HAPS scoring was more correlated in the course of non-severe disease. In a study on 149 patients, it was shown that both CTSI and modified CTSI scores were associated with disease severity parameters, and there was a correlation between imaging severity and poor clinical outcomes.[26] In another study, the thresholds for the prediction of severe AP were Ranson ≥3, BISAP ≥2, APACHE-II ≥8, and CTSI ≥3.[27]

Aging and pancreatitis is an important issue due to the aging population worldwide. In our study, the mean age of patients with diabetes was higher than that of non-diabetics. Yadav et al.[28] reported that the risk of AP increased gradually with age, and chronic pancreatitis mainly affected middle-aged individuals. In another retrospective study, the mean age of the patients was similar to our study.[29]

In the pathophysiology, cytokines, adipokines, damage-related molecular models, and unsaturated fatty acid-mediated lipotoxicity have been considered. The role of obesity in exacerbating pancreatic necrosis has been discussed. It has been shown that there may be pancreatic fat necrosis associated with obesity and that peripancreatic fat necrosis can worsen organ dysfunction independent of pancreatic necrosis.[30] In our study, patients with diabetes had higher BMI values than non-diabetics. In the study published by Khatua et al.[30] in 2017, it was suggested that obesity led to type 2 DM (T2DM), which secondarily caused an increase in the incidence of gallstones and hypertriglyceridemia, and that incretin-based treatments used in the treatment of DM, surgery, and endoscopic interventions for the treatment of obesity, caused an increase in the incidence of AP in the obese group.

Previous animal studies suggested that sustained hypertension increases pancreatic oxidative stress that might lead to pancreatic damage in hypertensive rats.[31] Further-

more, studies regarding acute pancreatitis in metabolic syndrome patients revealed that hypertension is more frequently seen in patients with severe acute pancreatitis.[32,33] Considering the blood pressure values of the patients at the time of admission, systolic blood pressure was found to be higher in patients with diabetes in our study. This situation may be an indicator of concomitant hypertension in patients with diabetes in our study, and therefore, the inability to control hypertension in these patients.

In several studies, patients with T2DM had comorbidities (e.g., obesity, heart failure, kidney disease, liver disease) that might increase the risk of severe AP and were strong predictors of premature death from AP.[34,35] In our study, of the total patients, 48.04% had hypertension, 17.65% had hyperlipidemia, 23.53% had cardiac disease, 9.80% had hypothyroidism, 5.88% had respiratory disease, and 3.92% had chronic renal disease. We observed that the presence of comorbidities did not affect the length of stay and mortality. In the study published by Murata et al.[36] in 2015, severe comorbidity resulted in higher hospital mortality and longer stay when evaluated using the Charlson Comorbidity Index in 1,090 hospitalized older patients in Japan. This conflicting finding could be attributed to the fact that the patients had mild-to-moderate pancreatitis and that the number of patients was low.

In our study, it was observed that triglyceride levels were higher in those with diabetes. It was previously reported that poorly controlled diabetes and diabetic ketoacidosis can trigger hypertriglyceridemia-associated acute pancreatitis.[37] In a review published by Thambiah et al.[38] in 2021, it was emphasized that an impaired lipid profile could be seen in poorly controlled type 1 diabetes and type 2 diabetes, even though it was well controlled, and that this situation was associated with insulin resistance rather than impaired glycemic control. In patients with diabetes, there is a significant increase in acute phase reactants such as CRP, PCT, and leukocyte values compared with patients without diabetes. The early and serial CRP level in AP is used as an indicator of the severity and progression of inflammation. Diabetes exacerbates systemic inflammation during pancreatitis, may have a major impact on the progression of pancreatitis at the local level, and may also increase systemic inflammatory parameters such as interleukin (IL)-6 concentrations in plasma.[39]

It is already known that serum amylase is a useful biochemical tool to diagnose acute pancreatitis. We observed that the amylase levels of the patients at admission were lower in diabetic patients. In the meta-analysis of Ko et al.,[40] which was published in 2020 and included 20 studies comprising 20,916 participants, individuals with type 2 diabetes had serum amylase levels 3.1 times lower, serum lipase levels 2.9 times lower, and serum trypsin levels 2.5 times lower than the upper limits of normal. These findings support the low levels of amylase and lipase in our study. Low amylase levels in patients with diabetes may indicate impaired exocrine functions of the pancreas.

We made a comparison by calculating the scores related to AP in diabetic and non-diabetic groups, but the lack of APACHE-II scoring, which has proven its power in many studies to predict the severity of AP, constituted the most important limitation of our study. Similarly, the 48th-hour Ranson score could not be calculated. The main reason for this was that the study was conducted retrospectively, and therefore, some laboratory parameters, especially blood gas, were not studied. Finally, due to the retrospective design of the study, a causative relationship cannot be established.

Conclusion

Among the scoring systems, Imrie, SIRS, and Ranson scores are higher in patients with diabetes with mild-moderate AP in comparison to non-diabetic patients. In addition, male gender and higher CTSI scores are associated with increased LOS in this specific patient group.

Ethics Committee Approval

The study was approved by the Kartal Dr. Lütfi Kırdar City Hospital Ethics Committee (Date: 14.04.2021, Decision No: 2021/514/199/2).

Informed Consent

Retrospective study.

Peer-review

Externally peer-reviewed.

Authorship Contributions

Concept: B.B.; Design: B.B.; Supervision: B.B.; Data: M.D.; Analysis: T.R.D.; Literature search: T.R.D.; Writing: M.D., H.E.; Critical revision: H.E.

Conflict of Interest

None declared.

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Nonbiliyer Akut Pankreatit ile Takip Edilen Diyabetik ve Non-diyabetik Hastaların Pankreatit Şiddet Skorları ve Hastane Yatış Sürelerinin Değerlendirilmesi

Amaç: Akut pankreatit (AP) seyrinde skorlama sistemlerini karşılaştıran birçok çalışma vardır, ancak diyabetli hastalarda skorlama sistemlerinin karşılaştırmalı analizleri sınırlıdır. Çalışmamızda birden fazla skorlama sistemi kullanan hastaları karşılaştırmayı ve diyabetli bireylerde hastanede kalış süresini (HKS) tahmin etmede tercih edilebilecek bir skorlama sisteminin olup olmadığını araştırmayı amaçladık.

Gereç ve Yöntem: Dahiliye kliniğinde AP ile takip edilen hafif ve orta şiddetli akut pankreatit hastaları geriye dönük olarak değerlendirildi. Diyabetli ve diyabetsiz hastalar demografik özellikleri, laboratuvar ve görüntüleme bulgularına göre iki grupta incelendi. Ranson, Sistemik İnflamatuvar Yanıt Sendromu (SIRS), Akut Pankreatitte Yatak Başı Şiddet İndeksi (BISAP), Modifiye Glasgow II Skorlaması (IMRIE), Zararsız Akut Pankreatit Skoru (HAPS), Balthazar ve Bilgisayarlı Tomografi Şiddet İndeksi (CTSI) skorları hesaplandı.

Bulgular: Diyabetli AP hastalarında serum trigliserit, lökosit, CRP ve prokalsitonin düzeyleri daha yüksekti ($p<0.05$). Diyabetik olmayan hastalarda serum amilaz düzeyleri biraz daha yüksekti ($p<0.05$). Diyabet varlığı, başvuru anında Ranson, SIRS ve Imrie skorları ile pozitif korelasyon gösterdi ($p<0.05$; $r=0.437$; $r=0.274$; $r=0.317$). Ciddiyet skorlarından sadece CTSI skoru >7 günden fazla yaşam süresi olan hastalarda anlamlı olarak daha yüksektir ($p<0.004$). Ayrıca DM varlığına göre HKS'ta farklılık görülmezken ($p=0.840$), HKS'si yüksek olan hastalarda ortalama HbA1c değerleri daha yüksekti ($p=0.037$). Regresyon analizi sonucunda erkek cinsiyet ve daha yüksek CTSI puanı artan HKS ile ilişkilidir (OR=0.266, $p=0.037$ vs OR=1.579, $p=0.022$).

Sonuç: Skorlama sistemlerinden IMRIE, SIRS, Ranson skorları hafif-orta şiddette AP diyabetli hastalarda diyabetik olmayan hastalara göre daha yüksektir. Ayrıca bu spesifik hasta grubunda erkek cinsiyet ve daha yüksek CTSI skorları artan HKS ile ilişkilidir.

Anahtar Sözcükler: Akut pankreatit şiddet skorları; diyabet; hastanede kalış süresi.