ORIGINAL ARTICLE

Don't waste time with scoring systems to predict mortality in Fournier's Gangrene, regulate blood sugar and defy death!

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ABSTRACT

BACKGROUND: Fournier's Gangrene (FG) is a rare, life-threatening necrotizing fasciitis of the perineum and genitourinary regions with high morbidity and mortality rates. Despite advancements in healthcare, FG remains a challenge due to its rapid progression and the need for aggressive intervention. This study aims to investigate the factors influencing mortality in FG patients, assess the effectiveness of laboratory parameters and scoring systems, and emphasize the role of blood glucose regulation in improving survival.

METHODS: This retrospective study included 36 patients diagnosed with FG at Bolu Abant Izzet Baysal University Medical Faculty Hospital between January 2014 and September 2024. Patients with incomplete data, a history of isolated perineal, gynecological or perianal surgeries unrelated to FG, and those under 18 years of age were excluded. For all patients, Neutrophil-Lymphocyte Ratio (NLR), Platelet-Lymphocyte Ratio (PLR), Lymphocyte-Monocyte Ratio (LMR), CRP-Albumin Ratio (CAR), and Prognostic Nutritional Index (PNI), Inflammatory Prognostic Index (IPI), Systemic Inflammation Index (SII), Combined Urology and Plastics Index (CUPI)", Laboratory Risk Indicator for Necrotizing Fasciitis (LRINEC), Fournier's Gangrene Severity Index (FGSI), and Uludağ Fournier's Gangrene Severity Index (UFGSI) scores were calculated. A comparison was made between the results obtained from laboratory parameters and scoring systems and the effect of blood sugar regulation on survival. Statistical analyses were performed using SPSS 27.

RESULTS: The mean age of the patients was 64.67±13.25 years, with a male-to-female ratio of 3:1. Diabetes Mellitus (DM) was present in 61.1% of cases and 66.7% of deceased patients. The mortality rate was 16.7%. Elevated blood glucose levels at admission were significantly associated with mortality (p=0.024). The cut-off value of 186.5 mg/dL for glucose predicted mortality with 83.3% sensitivity and specificity. Scoring systems such as LRINEC and CUPI also demonstrated predictive utility, but glucose was found to be a simpler, faster marker. Among inflammatory markers, Neutrophil-Lymphocyte Ratio (NLR) was significant (p=0.016) with a cut-off of 14.04, showing 83.3% sensitivity and 76.7% specificity.

CONCLUSION: FG is a rapidly progressing disease requiring early diagnosis and multidisciplinary management. While scoring systems and inflammatory markers are valuable for predicting mortality, blood glucose level stands out as a simple, rapid, and effective predictor. Ensuring blood sugar regulation can significantly improve prognosis and survival in FG patients, underscoring the need for immediate attention to glucose levels in clinical practice.

Keywords: Blood sugar; diabetes mellitus; Fournier's Gangrene; glucose; laboratory parameters; mortality; scoring systems.

INTRODUCTION

Necrotizing fasciitis (NF) is a rare disease characterized by inflammation of soft tissue that spreads rapidly along the fascial planes and often requires emergency surgical intervention.[1] Fournier's gangrene (FG) is a severe, life-threatening necrotizing fasciitis of the perineum and genitourinary regions of polymicrobial origin.[2-4] FG was first described in 1883 by

Cite this article as: Bolat F, Keyif MF, Şit M, Çatal O, Özer B, Erkol MH. Don't waste time with scoring systems to predict mortality in Fournier's Gangrene, regulate blood sugar and defy death! Ulus Travma Acil Cerrahi Derg 2025;31:472-479.

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Ulus Travma Acil Cerrahi Derg 2025;31(5):472-479 DOI: 10.14744/tjtes.2025.40921

Submitted: 12.12.2024 Revised: 06.03.2025 Accepted: 12.04.2025 Published: 05.05.2025

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French dermatologist and venereologist Jean Alfred Fournier as necrotizing fasciitis of the perineum and perianal region.[5]

FG is closely related to socioeconomic status and is more common in communities with low income and education levels and its frequency increases after the age of 50.[2] Etiologically, the infection is mostly of colorectal and perianal, gynecological, urological and dermatological origin.[2] FG is a rare condition mostly seen in men and can develop secondary to advanced age, diabetes mellitus (DM), chronic alcoholism, smoking, chronic renal failure, peripheral artery disease, immunosuppressive disease, malignancy, trauma, gynecological and urological surgery and perianal surgery.[5,6] DM has been detected in 20–70% of FG patients and has been closely associated with mortality.[2] This situation shows us the importance of high glucose levels at the time of admission and shows that blood sugar regulation is very important in reducing mortality.

The disease usually manifests itself with redness, pain and swelling in the urogenital and perianal region, while edema, discharge and crepitation accompany these symptoms. Due to the neglect of these initially seen symptoms, it progresses rapidly and hospital admission occurs with necrotizing infection of the soft tissue.[2,3,5]

Despite positive developments in health services and aggressive treatment approaches in recent years, FG continues to be seen as a rapidly progressing disease requiring repeated debridements with high mortality.[7] Early diagnosis is extremely important and rapid and effective treatment approaches are of critical importance in the process leading to mortality.

There are three basic stages in treatment: early diagnosis and hemodynamic resuscitation; rapid and effective surgical debridement and removal of necrotic tissues; and appropriate antibiotic therapy.[2] The presence of concomitant diseases such as DM causes mortality rates to increase, which makes early diagnosis and surgical intervention important. Therefore, in order to predict mortality, rates such as neutrophil-lymphocyte ratio (NLR), platelet-lymphocyte ratio (PLR), lymphocyte-monocyte ratio (LMR), CRP-albumin ratio (CAR) obtained from simple laboratory tests and prognostic nutritional index (PNI), inflammatory prognostic index (IPI), systemic inflammation index (SII), combined urology and plastics index (CUPI), laboratory risk indicator for necrotizing fasciitis (LRINEC), Fournier's gangrene severity index (FGSI) and Uludağ Fournier's gangrene severity index (UFGSI) scoring systems have been developed.[1,2,4,7,8]

The aim of the study is to investigate the factors affecting mortality in FG patients, to compare the efficiencies of laboratory parameters and scoring systems, to provide guidance to clinicians for patient management with the obtained results and, most importantly, to investigate ways to increase survival rates by performing rapid and effective intervention.

MATERIALS AND METHODS

The study was approved by the Bolu Abant Izzet Baysal University Medical Faculty Hospital Ethics Committee (Approval Number and Date: 2024/299–19/11/2024). Data from all cases treated with an FG diagnosis between January 2014 and September 2024 were retrospectively reviewed. Patients over the age of 18 who were diagnosed with FG as a result of examination and evaluation were included in the study. Patients with a history of perineal and perianal operations for inflammatory diseases were screened. A total of 1,319 patients were found. Patients with a history of surgery for isolated diseases of the perineal and perianal region, such as perianal abscess (n=377), perianal fistula (n=369), anal fissure (n=272), benign lesions of the anal and perineal region (n=6) and various diseases of the genital system such as Bartholin's cyst (n=220) and patients with a diagnosis of malignancy; patients with immunosuppressive disease and/or under immunosuppressive treatment; other patients who did not meet Jean Alfred Fournier's definition of FG; and patients whose data could not be accessed or were incompletely accessed from the hospital automation system (n=39) were excluded from the study. This study was conducted in accordance with the ethical principles of the Declaration of Helsinki.

The patient data were obtained using the hospital automation system (KARMED®). The patients were retrospectively screened and patients whose demographic data, preoperative and postoperative records, laboratory tests and radiological data could be fully accessed were included in the study. In addition, the study included patients who developed in the acute period and were rapidly intervened; no distinction was made between those with and without DM disease in the perioperative period. Therefore, the HbA1c level, which reflects the average glucose value of the last 2-3 months, was not included in the laboratory parameters.

For all patients, neutrophil-lymphocyte ratio (NLR), platelet-lymphocyte ratio (PLR), lymphocyte-monocyte ratio (LMR), CRP-albumin ratio (CAR) and prognostic nutritional index (PNI), inflammatory prognostic index (IPI), systemic inflammation index (SII), urology and plastics index (CUPI), laboratory risk indicator for necrotizing fasciitis (LRINEC), Fournier's gangrene severity index (FGSI) and Uludağ Fournier's gangrene severity index (UFGSI) scores were calculated. A comparison was made between the results obtained from laboratory parameters and scoring systems and the effect of blood sugar regulation on survival.

In order to minimize the effect of other independent conditions on glucose levels, patients with multiple organ failure, severe sepsis, septic shock and patients who received blood product replacement were taken into consideration when determining the study group and were excluded from the study.

Statistical Analysis

Statistical analyses were performed using the IBM SPSS Statistics 27 package program. The Kolmogorov-Smirnov test was applied to determine whether the data showed normal distribution. The Independent Samples t-test was applied for parameters showing normal distribution and the Mann-Whitney U test was applied for data not showing normal distribution. The Pearson Chi-Square test was applied for analysis of categorical data and Fisher's Exact Test was used in cases where the necessary conditions were not met. ROC curve analysis was performed to calculate the effect levels and cut-off values of the variables. The statistical significance of the analysis results obtained was evaluated with the p-value and $p<0.05$ values were considered statistically significant. With 80% statistical power and a significance level of $\alpha=0.05$, the minimum required sample size to detect an effect size of d=0.80 using the Mann-Whitney U test for independent groups (assuming the parent distribution is Laplace) was calculated as 36.

RESULTS

A total of 36 patients were included in the study. The mean age was 64.67±13.25 years (range=31–86). The female-to-male ratio was found to be 1:3. A total of 22 patients (61.1%) had DM. Half of the patients were smokers.

When the system records were examined, it was observed that 75% of the patients applied to the hospital within the first 10 days, while the average time between the onset of complaints and application to the hospital was calculated as 9.42±7.03 days. The average hospital stay was calculated as 24.39±26.47 days (range=3–140; 94 and 140 were extreme values).

Mortality was 16.7% (n = 6). The mean age of the 6 patients who lost their lives was 65.50±9.85 and it was observed that the female-to-male ratio among these patients was the same as the average in the study (1:3). Four of the patients who lost their lives (66.7%) had DM and 66.7% were smokers. The average hospital admission time of the patients who lost their lives was 9.17±3.43 days (this value for survivors was 9.47±7.0) and the average hospital stay was 16.5±17.02 days (this value for survivors was 25.97±27.93). No significant difference was found between the survivors and the deceased in terms of average hospital admission times (p=0.549). When the hospital stay times were examined, although the average for survivors was higher, no significant relationship was found between the two groups (p=0.243).

The mean blood glucose level of patients treated for FG was calculated as 174.69±101.51 mg/dL (range=59–513) when they were admitted to the hospital, while 14 (38.9%) of the patients had a blood glucose level of ≥180 mg/dL. The mean blood glucose level of patients who lost their lives was 237.5±93.37 mg/dL (range=159–420), while this value was calculated as 162.12±99.71 mg/dL (range=59–513) for patients who were discharged after treatment. Although the blood glucose level measured at the time of first admission was significantly higher in the group of patients who lost their lives, this difference was also found to be statistically significant (p=0.024). These results show that blood sugar regulation has a significant effect on survival (Figure 1).

When the vital signs of the patients included in the study were examined during their hospital admissions: the average body temperature was 36.84±0.49 °C, while this value was 37.0±0.33 °C in the deceased patient group. The average heart rate was 94.89±19.46 bpm, while this value was 102.11±29.83 bpm in the deceased patient group. The average respiratory rate was 20.46±2.99, while this value was 24.56±4.55 in the deceased patient group. When the significant relationship between the vital signs of the surviving patient group and the deceased patient group was investigated, a significant relationship was found for respiratory rate (p=0.005), but no significant relationship was found for body temperature (p=0.257) or heart rate (p=0.522).

Blood results of the patients receiving treatment with the diagnosis of FG were examined during their first admission to the hospital and a normal distribution test was applied. The Independent Samples t-test was applied for parameters showing normal distribution (HGB, HTC, MONO, ALB, CRP, Na, Ca and HCO_3) and the Mann-Whitney U test was applied for parameters not showing normal distribution (WBC, PLT, LYM, NEU, INR, glucose, ALP, total bilirubin, urea, creatinine and K). When the results were examined, CRP (p=0.023), WBC (p=0.007), NEU (p=0.006), glucose (p=0.024), ALP (p=0.030), urea (p=0.006), creatinine (p=0.012) and K (p=0.043) were found to be significant and when multiple comparison analysis was performed, WBC (adj-p=0.042), NEU (adj-p=0.042) and urea (adj-p=0.042) were also found to be significant (Table 1).

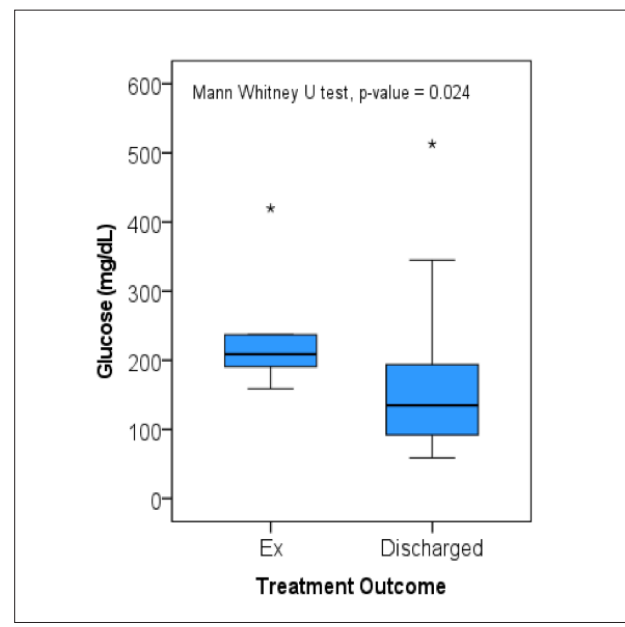

Figure 1. Comparison of glucose between study groups.

Table 1. Comparison of laboratory parameters between study groups

Parameters	Ex (n=6)	Discharged (n=30)	p-value[a]	Adjusted p-value[b]
HGB	10.2±4.39	11.47±2.05	0.271	0.542
HTC	31.08±14.38	34.12±6.06	0.393	0.544
MONO	0.88±0.54	0.9±0.45	0.918	0.918
ALB	27.5±5.13	28.39±5.56	0.719	0.809
CRP	248.62±73.76	166.5±77.39	**0.023**	0.083
Na	137±5.4	135.4±4.3	0.430	0.553
Ca	7.77±1.25	8.17±0.92	0.363	0.544
HCO3	12.5±8.23	16.73±4.99	0.100	0.225
WBC	27 (16.02-37.82)	13.05 (9.1-19.97)	**0.007**	**0.042**
PLT	389.5 (232.25-433.25)	272.5 (224.25-449.25)	0.470	0.564
LYM	1.02 (0.58-2.42)	1.22 (0.76-1.84)	0.766	0.811
NEU	25.31 (13.33-35.18)	9.66 (7.23-17.51)	**0.006**	**0.042**
INR	1.33 (1.17-1.71)	1.25 (1.14-1.41)	0.372	0.544
ALP	178 (122-232.75)	116 (85-140.75)	**0.030**	0.090
TotalBilirubin	0.7 (0.5-2.01)	0.59 (0.43-0.84)	0.308	0.544
Urea	152 (84.25-198.5)	44 (26.75-93.25)	**0.006**	**0.042**
Creatinine	3.32 (1.68-3.81)	0.95 (0.82-1.31)	**0.012**	0.054
K	4.85 (4.4-5.63)	4.3 (3.87-4.6)	**0.043**	0.111

Values are expressed as mean±sd or median (25th and 75th percentile). [a]Where mean±sd is given independent samples t-tests is used; where median (25th and 75th percentile) is given Mann–Whitney U test is used. [b]Bold p-values indicate statistical significance based on Benjamini-Hochberg adjustment for multiple testing. Bold p-values indicate statistically significant difference between three groups at α=0.05. HGB: Hemoglobin; HTC: Hematocrit; MONO: Monocytes; ALB: Albumin; CRP: C-Reactive Protein; Na: Sodium; Ca: Calcium; HCO3: Bicarbonate. WBC: White Blood Cells; PLT: Platelet; LYM: Lymphocytes; NEU: Neutrophils; INR: International Normalised Ratio; ALP: Alkaline phosphatase; K: Potassium.

Table 2. Comparison of scoring systems between study groups

Scoring Systems	Ex (n=6)	Discharged (n=30)	p-value[a]	Adjusted p-value[b]
CUPI	8.7±15.5	34.7±9.1	**0.002**	**0.011**
UFGSI	1.6±6	8.4±2.3	**0.004**	**0.015**
PNI	6.1±9.4	35.7±6.1	0.782	0.879
CAR	1.8±4.1	8.1±2.9	**0.025**	**0.041**
FGSI	9.5 (5-15.8)	5 (3-7.3)	**0.026**	**0.041**
LRINEC	10 (8.8-11.3)	7 (3.5-8)	**0.002**	**0.011**
IPI	185.6 (100.7-324.1)	55 (15.7-118.3)	**0.012**	**0.033**
SII	5202.9 (3585.1-10532.5)	2538.2 (1433.9-4483.1)	**0.046**	0.063
PLR	229.3 (112.3-587.5)	235.8 (161.2-364.7)	0.799	0.879
NLR	17.6 (13.5-39)	8.8 (4.2-14)	**0.016**	**0.035**
LMR	1.7 (0.7-4.3)	1.3 (1-2.3)	0.899	0.899

Values are expressed as mean±sd or median (25th and 75th percentile). [a]Where mean±sd is given independent samples t-tests is used; where median (25th and 75th percentile) is given Mann–Whitney U test is used. [b]Bold p-values indicate statistical significance based on Benjamini-Hochberg adjustment for multiple testing. Bold p-values indicate statistically significant difference between three groups at α=0.05. CUPI: Combined Urology and Plastics Index; UFGSI: Uludağ Fournier's Gangrene Severity Index; PNI: Prognostic Nutritional Index; CAR: CRP Albumin Ratio; FGSI: Fournier's Gangrene Severity Index; LRINEC: Laboratory Risk Indicator for Necrotizing Fasciitis; IPI: Inflammatory Prognostic Index; SII: Systemic Inflammation Index; PLR: Platelet Lymphocyte Ratio; NLR: Neutrophil Lymphocyte Ratio; LMR: Lymphocyte Monocyte Ratio.

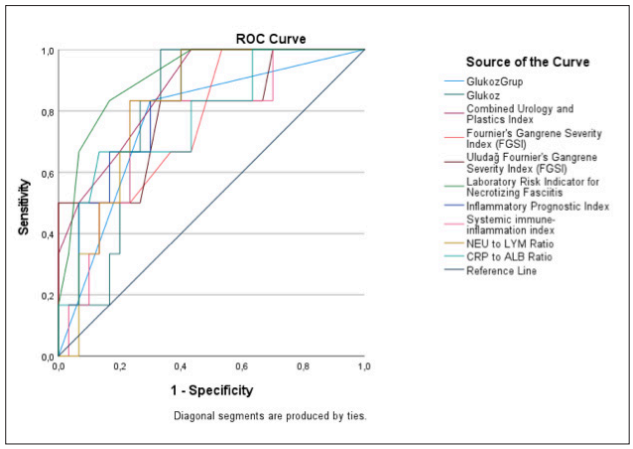

Figure 2. ROC Curve for scoring systems and laboratory parameters.

For each patient included in the study, CUPI, LRINEC, FGSI, UFGSI, PNI, IPI and SII scores and ratios such as NLR, PLR, LMR and CAR were calculated and mean, median, mode, standard deviation, minimum and maximum values were obtained and grouped separately for surviving and deceased patients. Then, a normal distribution test was applied for these data. The Independent Samples t-test was applied for parameters showing normal distribution (CUPI, UFGSI, PNI and CAR) and the Mann-Whitney U test was applied for parameters not showing normal distribution (FGSI, LRINEC, IPI, SII, PLR, NLR and LMR). The results obtained by performing multiple comparison analysis are shared in Table 2.

For each parameter, the area under the ROC curve (AUC), standard error (SE), p-value, cut-off value, sensitivity and specificity values were calculated and confidence intervals were measured separately. Although the obtained data were presented in figures and tables, when the results were examined, it was concluded that each of the scoring systems and laboratory parameters that were the subject of the study and were shown to be significant by various tests had very good discrimination power between the groups of those treated for FG who survived and those who lost their lives (Figure 2) (Table 3).

DISCUSSION

Fournier gangrene is a polymicrobial, rapidly spreading, necrotizing infection with high morbidity and mortality rates, usually seen in the elderly, originating from the skin and subcutaneous tissues of the perineum and external genital organs.[6] It can be seen in both sexes, but it is more common in men and those over 50 years of age.[3] The data obtained from our study showed that the mean age is high (64.67±13.25) and that it is encountered three times more frequently in men than in women. These results were found to be consistent with the literature.

Although many predisposing factors associated with FG have been determined, DM is the most important among these

Table 3. Area Under the Curve for scoring systems and laboratory parameters

Area Under the Curve								
				Asymptotic 95% Confidence Interval				
Test Result Variable(s)	Area	Std. Error[a]	Asymptotic Sig.[b]	Lower Bound	Upper Bound	Cut-off	Sensitivitiy (%)	Specificity (%)
Glukoz	0.794	0.074	0.024	0.650	0.939	186.5	83.3	73.3
CUPI	0.867	0.071	0.005	0.728	1.000	7.5	66.7	80
FGSI	0.789	0.101	0.027	0.592	0.986	6.5	66.7	63.3
UFGSI	0.786	0.110	0.029	0.571	1.000	12.5	66.7	70
LRINEC	0.911	0.056	0.002	0.802	1.000	8.5	83.3	83.3
IPI	0.828	0.075	0.012	0.680	0.975	107.14	66.7	70
SII	0.761	0.104	0.046	0.558	0.964	4195.77	83.3	76.7
NLR	0.817	0.073	0.016	0.673	0.961	14.04	83.3	76.7
CAR	0.781	0.105	0.032	0.575	0.986	7.79	66.7	66.7

The test result variable(s): Combined Urology and Plastics Index, Fournier's Gangrene Severity Index (FGSI), Uludağ Fournier's Gangrene Severity Index (FGSI), Laboratory Risk Indicator for Necrotizing Fasciitis, CRP to ALB Ratio has at least one tie between the positive actual state group and the negative actual state group. Statistics may be biased. [a]Under the nonparametric assumption. [b]Null hypothesis: true area = 0.5

CUPI: Combined Urology and Plastics Index; FGSI: Fournier's Gangrene Severity Index; UFGSI: Uludağ Fournier's Gangrene Severity Index; LRINEC: Laboratory Risk Indicator for Necrotizing Fasciitis; IPI: Inflammatory Prognostic Index; SII: Systemic Inflammation Index; NLR: Neutrophil Lymphocyte Ratio; CAR: CRP Albumin Ratio.

factors.[2,3,6,9] While this condition may be related to neuropathy and vascular complications secondary to diabetes, maintaining stable blood glucose levels and proper glycemic control appears to be the most important factor. A total of 61.1% of the patients included in this study had DM and the rate of DM among the patients who lost their lives was calculated as 66.7%. This rate was found to be consistent with the literature. In addition, the blood glucose level of the deceased patients at the time of admission to the hospital was significantly higher than that of the other patient group and was not regulated.

The first clinical symptoms that appear in FG patients are pain, redness, itching and edema starting in the external genital organs, perineum and perianal region. The infection is polymicrobial and spreads rapidly. In different studies, the rate of spread has been reported as 1 inch/hour along the fascial planes.[9] Despite the positive developments in health services and aggressive treatment approaches in recent years, FG continues to be seen as a rapidly progressing disease requiring repeated debridements with high mortality.[7] If these early symptoms are not taken seriously, they may progress rapidly, with pain decreasing due to ongoing nerve damage. This can delay hospital admission, leading to postponed diagnosis and treatment, ultimately accelerating the progression toward a fatal outcome.

There are three basic stages in the treatment of FG: early diagnosis and hemodynamic resuscitation, rapid and effective surgical debridement and removal of necrotic tissues and appropriate antibiotic treatment.[2] In order to reach these stages, the diagnosis must first be made quickly. Mortality rates can be reduced with rapid diagnosis and effective intervention. Studies have shown that mortality will increase if the diagnosis time for FG patients exceeds 136 minutes and that if the waiting time before debridement increases from 24 hours to 48 hours, the survival rate decreases from 93.2% to 75.2%.[9]

Many scoring systems have been developed to predict mortality. Laboratory parameters have been investigated and comparisons have been made to show their superiority over each other. CUPI, FGSI, Uludağ FGSI, LRINEC, NLR, PLR and CAR are some of them and the most emphasized ones.[1,3,5,8,9] In 2018, Ghodoussipour et al.[10] developed the CUPI scoring system, which consists of age and eight laboratory parameters, to predict the duration of hospitalization and prognosis.[9] Laor et al.[11] collected data on demographic information, medical history, signs and symptoms, laboratory parameters, extent of disease and number of surgical debridements in FG patients and investigated which factors were more effective on mortality. They created the FGSI in 1995.[2,5,12,13] Yilmazlar and colleagues created the Uludağ FGSI as a modification of the FGSI in 2010 and reported that they found a 94% probability of death with a UFGSI score >9 and an 81% probability of survival with a UFGSI score ≤9.[2,5,13,14] In 2004, Wong and colleagues created a diagnostic risk scoring system for NF called LRINEC and reported that they obtained a 92% positive predictive value and a 96% negative predictive value with a cut-off value of 6 points.[1,5,12,15]

In our study, a predictive level of 66.7% sensitivity and 80% specificity was obtained with a cut-off value of 7.5 for the CUPI score, which is below the literature average. Similarly, for FGSI, a sensitivity of 66.7% and a specificity of 63.3% were obtained with a cut-off value of 6.5; and for UFGSI, a sensitivity of 66.7% and a specificity of 70% were obtained with a cut-off value of 12.5. These rates are also below the literature average. For the LRINEC score, a higher sensitivity (83.3%) and specificity (83.3%) value was obtained compared to other scoring systems (cut-off 8.5). Both the results obtained from our study and the literature data show that each scoring system has advantages over the others, but it is not always possible to use these scoring systems in clinical practice and it is also controversial to accept them as a practical method in FG patients, where early diagnosis and rapid intervention are very important.

The severity of the disease and the importance of early diagnosis and rapid intervention have led researchers to search for more practical and effective methods. CAR is one of these and it has been shown in various studies that CAR correlates with the severity of infection, effectively shows prognosis as an inflammatory marker and is used as a tool to predict prognosis in many malignant and inflammatory diseases. According to one study, it was determined that CAR predicted survival with a cut-off value of 2.8 and a specificity of 80.8% in FG patients.[4] This study found that CAR had a sensitivity of 66.7% and a specificity of 66.7% in predicting mortality with a cut-off value of 7.79.

There are many studies in the literature indicating that inflammatory parameters such as NLR, PLR and LMR can also be used to predict prognosis for FG patients. NLR and PLR are the parameters that are frequently emphasized in particular. Various studies state that the higher the NLR, the worse the prognosis of the patients and even that the mortality rate in patients with NLR > 8 is approximately 12 times higher than in those with NLR < 8.[3,8] In our study, it was concluded that NLR has the power to predict mortality with a cut-off value of 14.04, 83.3% sensitivity and 76.7% specificity. The result was evaluated in accordance with the literature. On the other hand, in this study, contrary to the data in the literature, PLR was not found to be significant. Similarly, LMR was also investigated, but no significant results were obtained.

The study also conducted analyses for PNI, IPI and SII scores and PNI was not found to be significant in predicting mortality. IPI predicted mortality with a cut-off value of 107.14, sensitivity of 66.7% and specificity of 70%, but since no other study could be found in the literature showing the relationship between FG and IPI, a comparison could not be made. Similarly, no study was found showing the relationship between SII and FG, which is used to predict prognosis for many

inflammatory diseases, including COVID-19. The study investigated the effectiveness of SII in predicting mortality and concluded that it had a sensitivity of 83.3% and a specificity of 76.7% with a cut-off value of 4,195.77.

Various scoring systems and laboratory parameters have been used and continue to be used to predict prognosis and mortality in FG. While scoring systems offer greater specificity, they are often complex, time-consuming to calculate and challenging to apply in clinical practice. Similarly, laboratory parameters, though faster than scoring systems, still require calculation and are not specific to FG. However, one parameter stands out as significantly faster, easier to obtain and requiring no calculation or interpretation: blood glucose levels. By simply assessing blood glucose, we can predict mortality more rapidly and take timely action through glycemic control to improve patient outcomes. This study has shown that blood glucose level can predict mortality with a cut-off value of 186.5, with 83.3% sensitivity and 83.3% specificity. When it is taken into account that 4 of the 6 patients who lost their lives had DM and the average blood glucose level of these patients was 237.5 ±93.37 mg/dL, it will be better understood how important blood sugar regulation is.

There is no clear consensus in the literature on the effectiveness of scoring systems used in Fournier gangrene. It is controversial which system is more appropriate for which patient and how high mortality predictions may affect clinical decisions. However, scoring systems have been shown to predict the need for more surgical intervention, length of hospital stay, risk of sepsis and complications related to the disease. In this respect, they can be useful, especially in early risk classification, prognosis assessment and treatment planning. However, it should not be forgotten that instead of making decisions based solely on these systems in patient management, they should be used together with clinical evaluation and physician experience.

Based on these findings, while we recognize the significance of all scoring systems, we would like to highlight the crucial role of monitoring blood glucose levels and maintaining glycemic control. These factors are essential for obtaining faster and more effective results, improving prognostic assessment and reducing mortality.

CONCLUSION

FG is a disease that usually occurs in the advanced age group, involves the external genital organs, perineum and perianal region, progresses rapidly and has a high mortality rate if not diagnosed early and if effective surgical intervention is not applied. Mortality rates can be reduced with early diagnosis and a multidisciplinary approach.

Mortality risk can be assessed using various scoring systems and laboratory parameters; however, these methods often present practical challenges due to their complexity, the time required for calculation and difficulties in interpretation and application. In contrast, blood glucose levels, a routinely measured parameter in clinical practice, offer a more accessible alternative. Given its widespread use and immediate availability, blood glucose monitoring may serve as a valuable tool in prognostic assessment, while effective glycemic control could contribute to improved patient outcomes. Prioritizing a simplified yet effective approach through blood glucose regulation may enhance the efficiency of clinical decision-making.

Limitations

The most important limitations of the study were that it was a single-center study and that the number of patients was small. The patients who were diagnosed with FG but were excluded from the study due to incomplete hospital records were also a limitation of the study.

Acknowledgments: We appreciate the participation of all patients in this study, as well as the assistance provided by the Department of General Surgery, Bolu Abant Izzet Baysal University Faculty of Medicine.

Ethics Committee Approval: This study was approved by the Bolu Abant Izzet Baysal University Medical Faculty Hospital Ethics Committee (Date: 19.11.2024, Decision No: 2024/299).

Peer-review: Externally peer-reviewed.

Authorship Contributions: Concept: F.B.; Design: F.B., M.F.K.; Supervision: M.Ş., M.H.E.; Materials: F.B., O.Ç.; Data collection and/or processing: F.B., M.F.K.; Analysis and/or interpretation: F.B., M.F.K., O.Ç.; Literature review: F.B., B.Ö.; Writing: F.B.; Critical review: M.Ş., B.Ö., O.Ç., M.H.E.

Conflict of Interest: None declared.

Financial Disclosure: The author declared that this study has received no financial support.

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ORİJİNAL ÇALIŞMA - *ÖZ*

Fournier Gangreni'nde mortaliteyi tahmin etmek için puanlama sistemleriyle vakit kaybetmeyin, kan şekerini düzenleyin ve ölüme meydan okuyun!

AMAÇ: Fournier Gangreni (FG), yüksek morbidite ve mortalite oranlarına sahip, perine ve genitoüriner bölgelerin nadir görülen, yaşamı tehdit eden bir nekrotizan fasiitidir. Sağlık hizmetlerindeki gelişmelere rağmen FG, hızlı ilerlemesi ve agresif müdahaleye ihtiyaç duyması nedeniyle bir zorluk olmaya devam etmektedir. Bu çalışmanın amacı, FG hastalarında mortaliteyi etkileyen faktörleri araştırmak, laboratuvar parametrelerinin ve bu alanda kullanılan skorlama sistemlerinin etkinliğini değerlendirmek ve kan şekeri regülasyonunun sağkalımı iyileştirmedeki rolünü vurgulamaktır.
GEREÇ VE YÖNTEM: Bu retrospektif çalışmaya, Ocak 2014 ile Eylül 2024 arasında Bolu Abant İzzet Baysal Üniversitesi Tıp Fakültesi Hastanesi'nde FG tanısı konulan 36 hasta dahil edildi. Eksik verileri olan, FG ile ilgisi olmayan izole perineal, jinekolojik veya perianal cerrahi öyküsü bulunan ve 18 yaşın altındaki hastalar çalışmaya dahil edilmedi. Tüm hastalar için Nötrofil Lenfosit Oranı (NLR), Trombosit Lenfosit Oranı (PLR), Lenfosit Monosit Oranı (LMR), CRP Albümin Oranı (CAR) ile Prognostic Nutritional Index (PNI), Inflammatory Prognostic Index (IPI), Systemic Inflammation Index (SII), Urology and Plastics Index (CUPI), Laboratory Risk Indicator for Necrotizing Fasciitis (LRINEC), Fournier's Gangrene Severity Index (FGSI) ve Uludağ Fournier's Gangrene Severity Index (UFGSI) skorları hesaplandı. Laboratuvar parametrelerinden ve skorlama sistemlerinden elde edilen sonuçlar ile kan şekeri regülasyonunun sağkalıma etkisi karşılaştırıldı. İstatistiksel analizler SPSS 27 kullanılarak yapıldı.
BULGULAR: Hastaların ortalama yaşı 64.67±13.25 yıl olup erkek/kadın oranı 3/1 idi. Diabetes Mellitus (DM) vakaların %61.1'inde ve hayatını kaybeden hastaların %66.7'sinde mevcuttu. Ölüm oranı %16.7 idi. Hastaneye başvuruda ölçülen yüksek kan şekeri seviyeleri, ölüm oranıyla anlamlı şekilde ilişkiliydi (p=0.024). Glukoz için 186.5 mg/dL'lik cut-off değeri, %83.3 duyarlılık ve özgüllükle mortaliteyi öngördü. LRINEC ve CUPI gibi skorlama sistemleri de prognozu öngörmede faydalı bulundu ancak glukozun daha basit ve hızlı bir belirteç olduğu tespit edildi. İnflamatuvar belirteçler arasında Nötrofil-Lenfosit Oranı (NLR), %83.3 duyarlılık ve %76.7 özgüllük ile 14.04 cut-off değeri üzerinden anlamlı bulundu (p=0.016).
SONUÇ: FG, erken tanı ve multidisipliner yönetim gerektiren, hızla ilerleyen bir hastalıktır. Skorlama sistemleri ve inflamatuvar parametreler mortaliteyi öngörmede değerli olsa da, kan glukoz düzeyi basit, hızlı ve etkili bir öngörücü olarak öne çıkmaktadır. Kan şekeri regülasyonunun sağlanması, FG hastalarında prognozu ve sağkalımı önemli ölçüde iyileştirebilir ve klinik uygulamada glukoz seviyelerine acil dikkat gösterilmesi gerektiğini vurgular.

Anahtar sözcükler: Diabetes Mellitus; Fournier Gangreni; glukoz; kan şekeri; laboratuvar parametreleri; mortalite; skorlama sistemleri.

Ulus Travma Acil Cerrahi Derg 2025;31(5):472-479 DOI: 10.14744/tjtes.2025.40921