ORIGINAL ARTICLE

Prediction of mortality in necrotizing fasciitis: comparative evaluation of established prognostic scores and a novel scoring system in a retrospective cohort

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ABSTRACT

BACKGROUND: Necrotizing fasciitis (NF) is a rare but serious surgical emergency that progresses rapidly, requires urgent operative intervention, and carries a high mortality rate. Current prognostic scoring systems may have limited predictive power for mortality across different patient groups. The aim of this study was to identify clinical, laboratory, and radiological factors associated with mortality in patients with necrotizing fasciitis. In addition, the study aimed to provide a foundation for the development of a practical prognostic scoring system that could support early risk stratification in clinical practice.

METHODS: This retrospective cohort study examined data from 65 patients diagnosed with NF between January 2021 and December 2024. A modified scoring system was created by integrating the Charlson Comorbidity Index and the total body surface area ratio (Samsun Charlson Comorbidity Index, SaCCI). Sarcopenia was assessed using the psoas muscle index. Using receiver operating characteristic (ROC) analysis, the mortality predictive performance of the modified scoring system was calculated and compared with existing systems.

RESULTS: The SaCCI score demonstrated higher prognostic accuracy than existing systems in predicting mortality, achieving the highest discriminatory power with an area under the curve (AUC) of 0.885. Higher SaCCI scores were associated with a significantly increased risk of mortality. Sarcopenia and delayed surgical intervention were also associated with mortality.

CONCLUSION: The SaCCI score shows promise as an effective tool for predicting early mortality risk in patients with necrotizing fasciitis. The validity of this scoring system, which may inform clinical decision-making, should be confirmed by further multicenter studies.

Keywords: Necrotizing fasciitis; prognosis; sarcopenia; body surface area; risk assessment.

INTRODUCTION

Necrotizing fasciitis (NF) is a rapidly progressive, serious, and life-threatening soft tissue infection characterized by widespread necrosis and systemic inflammation of the fascial tissues. It can occur in various body areas, particularly the perineal region, extremities, and abdominal wall. Despite advances in intensive care and surgical techniques, NF is still associated with high mortality rates. Recent studies have reported mortality rates between 20% and 35%.[1,2]

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Various prognostic scoring systems have been developed to support clinical decision-making and risk stratification in Fournier's gangrene (FG), a type of NF. Among the most commonly used are the Fournier's Gangrene Severity Index (FGSI), the Uludağ FGSI (UFGSI), and the Simplified FGSI (SFGSI).[3,4] The Laboratory Risk Indicator for Necrotizing Fasciitis (LRINEC) score, originally designed to aid in diagnosis, has also been used to predict mortality in some studies.[5] These scoring systems have only been used in cases of Fournier's gangrene confined to the perineal region. Additionally, several studies have demonstrated limitations of these scoring systems regarding their prognostic performance. For example, two studies reported sensitivity and specificity for the LRINEC score ranging from 27% to 43% and 83% to 93%, respectively, while for the FGSI, these rates were 82% and 58%, respectively.[5,6] Due to their variable prognostic performance, the reliability of existing scores in identifying high-risk patients has been increasingly questioned in recent studies.[5,6]

In recent reviews and meta-analyses, sarcopenia has been significantly associated with mortality, complication rates, and length of hospital stay in necrotizing soft tissue infections, as in many surgical conditions.[7-9] Similarly, the affected total body surface area (TBSA) ratio has been identified as a prognostic variable influencing clinical outcomes and has been associated with mortality, as it quantifies the extent of infection.[10,11] However, these parameters are not systematically included in existing prognostic scoring systems.

In this context, the present study aimed to investigate clinical, laboratory, and radiological factors associated with mortality in patients diagnosed with necrotizing fasciitis who required emergency surgical intervention. In addition to identifying prognostic indicators, we also sought to construct a composite scoring system by integrating the most relevant predictors, with the goal of improving mortality risk stratification in clinical practice. This approach was designed to offer a more practical and tailored alternative to existing models.

MATERIALS AND METHODS

This retrospective cohort study was conducted at a tertiary referral center. The study protocol was reviewed and approved by the Local Ethics Committee (Approval No: GOKAEK 2024/20/13, Date: 20.11.2024). Given the retrospective design and the fact that all procedures were part of routine care, the requirement for informed consent was waived. The study was conducted in accordance with the principles of the Declaration of Helsinki.

A total of 78 patients were initially identified, of whom 13 were excluded due to incomplete clinical or radiological data. The final analysis included 65 patients diagnosed with necrotizing fasciitis. The study period was defined as January 2021 to December 2024. Electronic medical records before 2020 were not reliably accessible, and the year 2020 was excluded due to the potential confounding impact of the Coronavirus Disease 2019 (COVID-19) pandemic on emergency surgical practice. The diagnosis of necrotizing fasciitis was based on clinical suspicion (rapidly progressive soft tissue infection with systemic signs), supported by laboratory findings and imaging studies (computed tomography [CT] and/or magnetic resonance imaging [MRI]), and was definitively confirmed during emergency surgical exploration. Intraoperative findings such as fascial necrosis, grayish "dishwater" fluid, lack of bleeding of the fascia, and easy blunt dissection along tissue planes were considered diagnostic. Histopathological confirmation was obtained in all cases. All patients were started on broad-spectrum empiric antibiotic therapy upon admission, and hemodynamic stabilization was achieved. Surgical debridement was performed in all eligible patients to control infection, and repeat debridements were performed when necessary. Intensive care support was provided to patients requiring intensive care.

Patient demographics (age, gender), comorbidities, clinical findings, laboratory parameters, imaging findings, and treatment details were screened through the hospital automation system and the Turkish Ministry of Health's e-Pulse system and recorded. Patients with incomplete medical records were excluded from the study. Scores were calculated using the Charlson Comorbidity Index, Necrotizing Fasciitis Laboratory Risk Indicator (LRINEC), Fournier Gangrene Severity Index (FGSI), Uludağ FGSI (UFGSI), and Simplified FGSI (SFGSI) scoring systems. Additionally, inflammatory markers such as neutrophil-to-lymphocyte ratio (NLR), platelet-to-lymphocyte ratio (PLR), systemic immune-inflammation index (SII), and lymphocyte-to-CRP ratio (LCR) were assessed.

The affected total body surface area (TBSA) was calculated based on the extent of necrotic tissue identified on contrast-enhanced computed tomography scans. Necrotic areas were manually marked on CT images to calculate the total affected surface area, and this value was then compared to the patient's total body surface area. These measurements were also verified by comparison with the extent of necrosis reported in the operative reports. TBSA was divided into two groups: <3% and ≥3%. This cutoff was determined to be the optimal cutoff value providing the highest balance of sensitivity and specificity for mortality based on receiver operating characteristic (ROC) curve analysis. Psoas muscle area (PMA) was measured on CT images at the level of the third lumbar vertebra, and the psoas muscle index (PMI) was calculated by dividing the patient's height in meters squared.

Parameters found to have a statistically significant relationship with mortality were combined with existing scoring systems to develop modified scoring systems. The performance of the modified scoring systems in predicting mortality was evaluated and compared with the original scores. Each scoring system was combined with the affected total body surface area ratio (<3%: 0 points, ≥3%: 1 point) to create composite indices. The performance of these combinations in predicting mortality was evaluated and compared with the original scores, considering the balance between specificity and sensitivity.

All statistical analyses were performed using IBM SPSS Statistics for Windows, version 28.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics were used to summarize the data. The normality of distribution of continuous variables was assessed using the Shapiro–Wilk test. Normally distributed variables were expressed as mean ± standard deviation (SD), while non-normally distributed variables were expressed as median and range (minimum–maximum). Categorical variables were presented as number and percentage (%). Comparative analyses were performed according to mortality status. Multiple comparison procedures were limited to the categorical variables "etiology" and "site of infection." As no statistically significant differences were found among subgroups, post hoc analyses or correction methods (e.g., Bonferroni) were not applied. This approach was chosen to avoid unnecessary adjustment in the absence of significant findings, in line with standard statistical practice. Comparisons between two independent groups were performed using the Mann–Whitney U test for non-normally distributed data and Student's t-test for normally distributed data. Categorical variables were compared using the Chi-square test or Fisher's exact test, when appropriate. ROC curve analysis was performed to evaluate the prognostic value of various clinical and laboratory parameters in predicting mortality. The area under the curve (AUC), sensitivity, specificity, and optimal cut-off values were calculated for each score. The optimal cut-off value for the Samsun Charlson Comorbidity Index (SaCCI) score and the other scores was determined using ROC curve analysis, and a threshold of ≥3.5 was selected based on the Youden Index. In all statistical analyses, $p<0.05$ was considered significant.

RESULTS

The mean age of the study population was 59.6±13.0 years, and 53.8% of the patients (n=35) were male. The mean age of female patients was 64.8±11.4 years, while this value was 55.1±12.8 years in males (p=0.002). Of all patients, 63.1% (n=41) had diabetes mellitus, and 36.9% (n=24) had hypertension. The mortality rate was 26.8% (n=11) in diabetic patients and 20.8% (n=5) in those without diabetes. There was no significant difference in mortality rates according to the presence of diabetes (p=0.588). The mortality rate in patients with hypertension was 33.3% (n=8) and 19.5% (n=8) in those without hypertension. No significant difference was found between these two groups in terms of mortality (p=0.212). The median duration of hospital stay was 17 days (range: 1-95). While the median length of stay in patients who died was 20.5 days (range: 5-95), it was 15 days (range: 1-58) in survivors (p=0.092). The most common etiological factor was spontaneous onset of the disease (87.7%, n=57). The proportion of postoperative and trauma-related cases was 6.2% (n=4) each. Sixty patients (92.3%) had at least one comorbid disease, while only 7.7% (n=5) had no comorbid disease. The perianal region was the most commonly affected infection site (52.3%, n=34), followed by the lower abdomen (10.8%, n=7), genital area (13.8%, n=9), gluteal region (9.2%, n=6), upper abdomen (4.6%, n=3), upper thigh (6.2%, n=4) and back (3.1%, n=2). The positivity rate in microbiological cultures was 50.8% (n=33). The sepsis rate was 36.9% (n=24). The overall mortality rate was 24.6% (n=16), while the survival rate was 75.4% (n=49) (Table 1).

Table 1. Clinical characteristics of the study population

Variable	N	%
Etiology		
Spontaneous	57	87.7
Postoperative	4	6.2
Trauma	4	6.2
Comorbidities		
Yes	60	92.3
No	5	7.7
Site of Infection		
Genital	9	13.8
Gluteal	6	9.2
Lower abdomen	7	10.8
Perianal	34	52.3
Upper abdomen	3	4.6
Upper back	2	3.1
Upper thigh	4	6.2
Microbiology culture		
Positive	33	50.8
Negative	32	49.2
Sepsis		
Yes	24	36.9
No	41	63.1
Mortality		
Yes	16	24.6
No	49	75.4

Right and left psoas muscle area measurements were found to be significantly lower in deceased patients. The mean right psoas muscle area was 6.0±1.9 cm^2 in deceased patients and 7.7±2.5 cm^2 in survivors (p=0.015). The left psoas muscle area was 5.5±1.9 cm^2 in deceased patients and 7.1±2.6 cm^2 in survivors (p=0.032). Similarly, the total psoas muscle index was found to be significantly lower in deceased patients (434.8±148.6 vs. 524.9±140.2, p=0.031). However, the Charlson Comorbidity Index (median 5 [1-9] vs. 2.5 [0-10], p<0.001), LRINEC score (9 [6-13] vs. 7 [1-11], p=0.001), FGSI score (6 [1-18] vs. 3 [0-15], p=0.003), UFGSI score (8 [4-23] vs. 5 [1-16], p=0.001), and SFGSI score (3.5 [0-10] vs. 2 [0-6], p=0.003) were significantly higher in patients who died compared to survivors (Table 2).

In the total body surface area analysis, 75.0% of patients with

Table 2. Comparison of laboratory and clinical parameters according to mortality

	Mean±SD or Median (Min-Max)		P Value
	Mortality	**No Mortality**	
CRP	260.9±90.5	221.3±113.6	0.209
PMA Right	6.0±1.9	7.7±2.5	0.015*
PMA Left	5.5±1.9	7.1±2.6	0.032*
Total PMI	434.8±148.6	524.9±140.2	0.031*
CCI5 (1-9)	2.5 (0-10)	<0.001*	
LRINEC	9 (6-13)	7 (1-11)	0.001*
FGSI	6 (1-18)	3 (0-15)	0.003*
UFGSI	8 (4-23)	5 (1-16)	0.001*
SFGSI	3.5 (0-10)	2 (0-6)	0.003*
NLR	13.7 (6.0-61.0)	10.2 (2.0-64.2)	0.157
LCR	0.005 (0.001-0.041)	0.006 (0.001-0.073)	0.157
SII	2057 (310-25193)	2334 (982-22177)	0.493
PLR	177.1 (16.0-1376.7)	226.4 (75.8-687.0)	0.185
Categorical Parameters	**n** **%**	**n** **%**	
Sex			
Male	7 43.8	28 57.1	
Female	9 56.3	21 42.9	0.351
Total BSA (%)			
<3	4 25.0	38 77.6	
>3	2 75.0	11 22.4	<0.001*
Sepsis			
Yes	12 75.0	12 24.5	
No	4 25.0	37 75.5	<0.001*
CKD			
Yes	13 81.3	49 100.0	
No	2 18.8	0 0.0	0.013*
Malignancy			
Yes	10 62.5	44 89.8	
No	6 37.5	5 10.2	0.020*

PMI: Psoas muscle index; CCI: Charlson Comorbidity Index; LRINEC: Laboratory Risk Indicator for Necrotizing Fasciitis; FGSI: Fournier's Gangrene Severity Index; UFGSI: Uludag Fournier's Gangrene Severity Index; SFGSI: Simplified Fournier's Gangrene Severity Index; NLR: Neutrophil-to-lymphocyte ratio; LCR: Lymphocyte-to-C-reactive protein ratio; SII: Systemic immune-inflammation index; PLR: Platelet-to-lymphocyte ratio; BSA: Body surface area; CKD: Chronic kidney disease. *Statistically significant at p<0.05.

an involvement rate above 3% died, compared with 22.4% of patients with a TBSA rate below 3% (p<0.001). Furthermore, the incidence of sepsis was significantly higher in patients who died. Sepsis was present in 75.0% of patients who died, compared to 24.5% of surviving patients (p<0.001). Chronic kidney disease (CKD) was also significantly more common in patients who died compared to survivors (81.3% vs. 0.0%, p=0.013). Similarly, the presence of malignancy was significantly associated with mortality. Malignancy was present in 62.5% of patients who died and in 10.2% of survivors (p=0.020) (Table 2).

Among the parameters evaluated, the Charlson Comorbidity Index showed the highest discriminatory power in predicting mortality, with an AUC of 0.794, 81.3% sensitivity, and 66.6% specificity at a cut-off value of 3.5 (p<0.001). The UFGSI score also demonstrated strong predictive performance,

reaching an AUC of 0.768 with 88.0% sensitivity and 63.0% specificity at a cut-off value of 5.5 (p=0.001). The LRINEC score had an AUC of 0.760 at a cut-off value of 7.5, providing 81.3% sensitivity and 54.2% specificity (p=0.002). Similarly, the FGSI (cut-off: 4.5) and SFGSI (cut-off: 1.5) scores were also statistically significant predictors of mortality, with AUCs of 0.746 for FGSI (p=0.003) and 0.742 for SFGSI (p=0.004).

Notably, the PMI score was also significant. However, at a cut-off value of 369, the AUC was 0.682 (p=0.029). This finding indicated an inverse relationship, meaning that lower PMA values were associated with a higher risk of mortality. Although sensitivity was high (87.8%), specificity was quite low (31.3%) (Table 3, Fig. 1).

By integrating the total body surface area involvement ratio into scoring systems, the predictive performance of some parameters was improved. The combination of the Charlson Comorbidity Index and the TBSA score showed the highest discriminatory power in predicting mortality. This combination achieved an AUC of 0.885, with 100.0% sensitivity and 70.3% specificity at a cut-off value of 3.5 (p=0.012). The combination of the LRINEC score and the TBSA score also demonstrated strong predictive ability, achieving an AUC of 0.838 with 100.0% sensitivity and 54.1% specificity at a cut-off value of 7.5 (p=0.028). The combination of the UFGSI and the TBSA score was also significant, with an AUC of 0.795, sensitivity of 93.8%, and specificity of 40.0% at a cut-off value of 4.5 (p<0.001). In contrast, the combination of the FGSI and TBSA score had a moderate AUC of 0.730 but did not reach statistical significance (p=0.135) (Table 4). The dashed line in the graph indicates the baseline representing no discriminatory power (AUC=0.5) (Fig. 2).

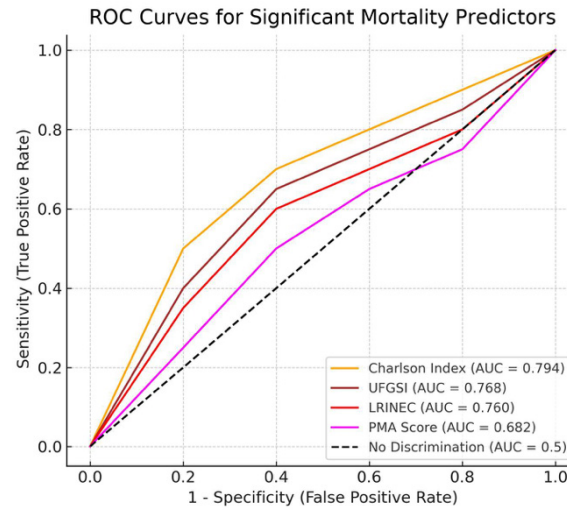

Figure 1. ROC curves of significant mortality predictors (CCI, LRINEC, FGSI, UFGSI, SFGSI, PMI). The dashed line indicates the reference (AUC=0.5).

In our study, a modified prognostic scoring system combining the Charlson Comorbidity Index and the TBSA score was developed and named the Samsun Charlson Comorbidity Index. ROC analysis revealed an AUC of 0.885 for the SaCCI score in predicting mortality (p=0.012). The optimal cut-off value was 3.5, providing high accuracy in predicting mortality with 100% sensitivity and 70.3% specificity. Accordingly, patients with a SaCCI score of ≥3.5 were considered high risk.

DISCUSSION

In this study, a modified prognostic scoring system, the SaC-

Table 3. Receiver operating characteristic (ROC) analysis of potential mortality predictors in patients

Parameter	Value	Sensitivity %	Specificity %	95% CI	AUC/p
CCI	3.5	81.3	66.6	0.672–0.916	0.794/<0.001*
LRINEC	7.5	81.3	54.2	0.637–0.882	0.760/0.002*
FGSI	4.5	75.0	69.0	0.607–0.885	0.746/0.003*
UFGSI	5.5	88.0	63.0	0.644–0.892	0.768/0.001*
SFGSI	1.5	81.3	50.0	0.596–0.888	0.742/0.004*
NLR	17.3	50.0	75.0	0.463–0.779	0.621/0.149
LCR	0.005	43.8	41.7	0.231–0.535	0.383/0.163
SII	2345.6	43.8	50.0	0.244–0.638	0.441/0.485
PLR	229.5	43.8	50.0	0.202–0.569	0.384/0.172
PMI	369	87.8	31.3	0.155–0.472	0.682/0.029
Hemoglobin	10.5	75.0	53.1	0.457–0.760	0.612/0.183
CRP	228	75.0	51.0	0.468–0.772	0.621/0.148

CCI: Charlson Comorbidity Index; PMI: Psoas muscle index; LRINEC: Laboratory Risk Indicator for Necrotizing Fasciitis; FGSI: Fournier's Gangrene Severity Index; UFGSI: Uludag Fournier's Gangrene Severity Index; SFGSI: Simplified Fournier's Gangrene Severity Index; NLR: Neutrophil-to-lymphocyte ratio; LCR: Lymphocyte-to-C-reactive protein ratio; SII: Systemic immune-inflammation index; PLR: Platelet-to-lymphocyte ratio. *Statistically significant at p<0.05.

Table 4. Receiver operating characteristic (ROC) analysis of combined mortality predictors including total body surface area (BSA)

Parameter	Value	Sensitivity %	Specificity %	95% CI	AUC/p
CCI+Total BSA	3.5	100.0	70.3	0.724-0.936	0.885/0.012*
LRINEC+Total BSA	7.5	100.0	54.1	0.716-0.922	0.838/0.028*
FGSI+Total BSA	3.5	75.0	51.4	0.648-0.912	0.730/0.135
UFGSI+Total BSA	4.5	93.8	40.0	0.680-0.911	0.795/<0.001*

CCI: Charlson Comorbidity Index; LRINEC: Laboratory Risk Indicator for Necrotizing Fasciitis; FGSI: Fournier's Gangrene Severity Index; UFGSI: Uludag Fournier's Gangrene Severity Index; BSA: Body surface area. *Statistically significant at p<0.05.

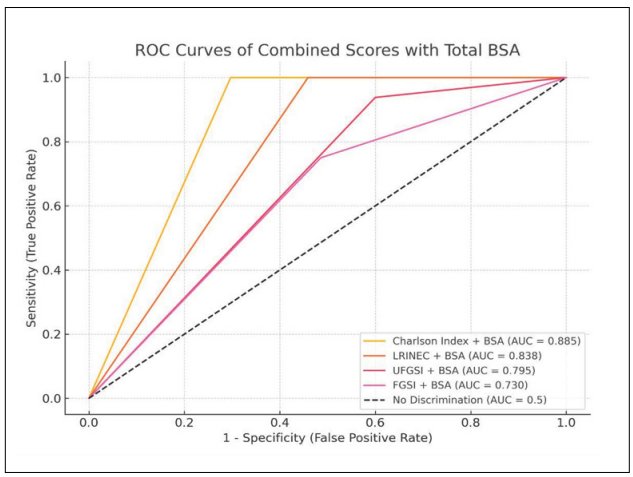

Figure 2. ROC curves of combined predictors including TBSA (CCI+TBSA, LRINEC+TBSA, UFGSI+TBSA, FGSI+TBSA), demonstrating improved discrimination in several combinations.

CI, was developed based on the combination of the Charlson Comorbidity Index and total body surface area to more accurately predict mortality in patients with necrotizing fasciitis, a surgical emergency in which delays in operative management can have fatal consequences. ROC analyses revealed that, with an AUC of 0.885, the SaCCI score demonstrated better prognostic accuracy than other scores.

In recent years, several studies have raised concerns about the limited discriminative power of traditional scoring systems in predicting mortality in necrotizing fasciitis. For example, Tran et al.[12] emphasized the variability in LRINEC performance and highlighted the need for more integrated models. Similarly, Bestari et al.[13] showed that both FGSI and quick Sequential Organ Failure Assessment (qSOFA) had moderate prognostic value in Fournier's gangrene. These findings support the rationale for developing composite tools such as the SaCCI that incorporate comorbidities and anatomical extent.

Among these traditional scoring systems, the LRINEC score, introduced by Wong et al.,[14] remains one of the most widely used tools for diagnosing and stratifying NF. However, subsequent studies have suggested that the prognostic validity of the LRINEC may be limited, particularly in heterogeneous patient groups.[6] Conversely, some studies have reported that high-risk patients can be better identified when the LRINEC score is ≥7.[15] Similarly, other scoring systems such as the FGSI, UFGSI, and SFGSI have also been used, particularly in Fournier's gangrene, which involves the perineal region in NF, and significant differences in their performance have been observed.[4] In the present study, the AUC values of these systems ranged from 0.742 to 0.768, and the SaCCI score appeared to perform better than all of these scores.

The impact of the TBSA parameter on the performance of the SaCCI score is noteworthy. In the literature, Morais et al.[10] reported a significant increase in mortality rates in patients with an affected body surface area ratio of more than 3.25%. The same study also emphasized that the combination of LRINEC and TBSA significantly increased its predictive power. The SaCCI score is one of the few systems in which this parameter is integrated into clinical scoring.

In the present study, mortality was also associated with clinical factors such as sarcopenia, age, and timing of surgery. Sarcopenia, particularly when assessed using the psoas muscle index, was associated with an increased risk of mortality in necrotizing soft tissue infections. Castillo-Angeles et al.[7] reported that sarcopenia significantly increased mortality in this patient group. In our study, PMI was found to be significantly lower in patients who died. Although sarcopenia showed a statistically significant association with mortality, it was not included in the SaCCI score for several reasons. First, the measurement of sarcopenia using the psoas muscle index requires radiological analysis and manual tracing on CT images, which limits its routine applicability in emergency settings. Second, in our ROC analyses, sarcopenia did not demonstrate sufficient discriminative power to enhance the performance of the composite model. Therefore, it was deliberately excluded in favor of a more pragmatic scoring tool that could be applied universally without reliance on imaging-based muscle metrics.

Multicenter analyses have also demonstrated that easily accessible demographic parameters such as age have a strong impact on mortality. For example, a study by Gebran et al.[16] reported a 3.36-fold increased risk of mortality in individuals aged 80 years and older. Furthermore, a study by Jabbour

et al.[2] identified age as an independent prognostic factor in necrotizing soft tissue infections. As the Charlson Comorbidity Index reflects age-related comorbidity burden, the SaCCI score indirectly represents this effect.

In addition to its predictive performance, the SaCCI score offers several practical advantages in clinical application. It is calculated using only two parameters that are routinely available during the initial evaluation: the Charlson Comorbidity Index and the total body surface area affected. These values require no laboratory testing, advanced imaging, or special software, making the SaCCI both time-efficient and cost-effective. Its simplicity enables rapid bedside calculation, which is particularly beneficial in high-acuity emergency settings where early risk stratification is crucial.

This is especially relevant considering that the timing of surgical intervention is another critical factor influencing mortality. Systematic reviews have shown that debriding infected tissue within the first six hours can reduce mortality by up to 19%, whereas surgical delays can increase this rate by as much as 32%.[17,18] We believe that the SaCCI score, along with other established scoring systems, can contribute to the early identification of patients requiring urgent intervention.

Strengths and Limitations

This study has several limitations. First, its single-center, retrospective design may introduce selection bias and limit generalizability. Second, 13 of 78 patients (16.6%) were excluded due to missing data, which may affect the representativeness of the cohort. Third, the relatively small sample size (n=65) and low number of mortality events (n=16) reduce the power of subgroup analyses.

Additionally, TBSA assessment, although supported by intraoperative findings, may still carry interobserver variability. Prior studies have noted that common TBSA calculation methods often overlook individual differences such as age, sex, and body composition.[19] Finally, although sarcopenia was statistically associated with mortality, it was not included in the SaCCI score due to its limited practicality and insufficient contribution to model performance.

Nonetheless, this study also presents important strengths. To our knowledge, it is one of the few studies to propose a modified scoring system that combines both comorbidity burden and anatomical disease extent in necrotizing fasciitis. The SaCCI score uses only two routinely obtainable clinical parameters and demonstrated superior predictive performance compared to existing models. The incorporation of intraoperative findings to assess TBSA may also increase real-world applicability. Future multicenter prospective studies with larger cohorts are needed to validate these results and assess clinical utility in diverse settings.

CONCLUSION

The Samsun Charlson Comorbidity Index, a modified scoring system based on the Charlson Comorbidity Index (CCI) developed to predict mortality in necrotizing soft tissue infections requiring emergency surgery, demonstrated stronger predictive performance compared to existing systems. The cut-off value of 3.5, in particular, stood out as a significant threshold that allows for early identification of high-risk patients. By enabling rapid recognition of patients in need of urgent operative intervention, SaCCI could support timely surgical decision-making in emergency settings. Prospective validation of this scoring system, which has high applicability in clinical decision-support processes, through multicenter, large-sample studies is crucial for its integration into clinical practice.

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Ethics Committee Approval: This study was approved by the Samsun University Ethics Committee (Date: 20.11.2024, Decision No: 2024/20/13).

Peer-review: Externally peer-reviewed.

Authorship Contributions: Concept: C.A.; Design: C.A.; Supervision: C.A., B.K.; Materials: M.Ö., M.G.; Data collection and/or processing: M.G.; Analysis and/or interpretation: İ.D.; Literature review: M.A.A.; Writing: C.A.; Critical review: M.A.A., B.K.

Conflict of Interest: None declared.

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ORİJİNAL ÇALIŞMA - *ÖZ*

Nekrotizan fasiitte mortalite öngörüsü: Mevcut prognostik skorların ve yeni bir skorlama sisteminin retrospektif kohortta karşılaştırmalı değerlendirmesi

AMAÇ: Nekrotizan fasiit (NF), hızlı ilerleyen, acil cerrahi müdahale gerektiren ve yüksek mortalite riski taşıyan nadir fakat ciddi bir cerrahi acildir. Mevcut prognostik skorlama sistemleri, farklı hasta gruplarında mortaliteyi öngörmede sınırlı kalabilmektedir. Bu çalışmanın amacı, nekrotizan fasiitli hastalarda mortalite ile ilişkili klinik, laboratuvar ve radyolojik faktörleri belirlemekti. Ayrıca, elde edilen bulgular doğrultusunda, klinik uygulamalarda erken risk sınıflamasına katkı sağlayabilecek pratik bir prognostik skorlama sistemi geliştirilmesine temel oluşturmak hedeflenmiştir.

GEREÇ VE YÖNTEM: Bu retrospektif kohort çalışmada, Ocak 2021 ile Aralık 2024 arasında, NF tanısı alan 65 hastanın verileri incelenmiştir. Charlson Komorbidite İndeksi ile total vücut yüzey alanı oranı entegre edilerek modifiye bir skorlama sistemi (Samsun Charlson Komorbidite İndeksi – SaCCI) oluşturulmuştur. Sarkopeni, psoas kas indeksi (PMI) ile değerlendirilmiştir. ROC analizi kullanılarak mortaliteyi öngörme performansı hesaplanmış ve mevcut skorlarla karşılaştırılmıştır.

BULGULAR: SaCCI skoru, mortaliteyi öngörmede mevcut sistemlere kıyasla daha yüksek prognostik doğruluk göstermiştir. ROC analizinde en yüksek ayırt edici güce ulaşarak AUC değeri 0.885 bulunmuştur. Yüksek SaCCI skorları, anlamlı şekilde artmış mortalite riski ile ilişkilendirilmiştir. Ayrıca sarkopeni ve gecikmiş cerrahi müdahale de mortalite ile ilişkili bulunmuştur.

SONUÇ: SaCCI skoru, nekrotizan fasiitli hastalarda mortalite riskini erken öngörmede etkili bir araç olma potansiyeli taşımaktadır. Klinik karar süreçlerine katkı sağlayabilecek bu skorlama sisteminin geçerliliği, çok merkezli ileri çalışmalarla teyit edilmelidir.

Anahtar sözcükler: Nekrotizan fasiit; prognostik değerlendirme; risk sınıflaması; sarkopeni; vücut yüzey alanı.

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