Journal of Carcinogenesis
Covering Genesis to Therapeutics

Journal of Carcinogenesis, ISSN: 1477-3163
2026; Vol 25: Issue 1, https://carcinogenesis.com/

Diagnostic Accuracy of the LRINEC Score for Necrotizing Fasciitis Using Histopathology as the Gold Standard

Ali Bahadur[1], Muneeba Amin[2], Ghulam Mustafa Mahmood[3], Huzaifa Abeer[4], Ghazia Rehman[5], Mohammad Masood Ur Rauf Hiraj Khan[6]

[1]PG Trainee, General Surgery, Nishtar Hospital Multan, Multan, Pakistan

[2,3,4,5]Internal Medicine, King Edward Medical University, Lahore, Pakistan

[6]Professor, General Surgery, Nishtar Hospital, Multan, Pakistan

Corresponding Author: Ali Bahadur,

PG Trainee, General Surgery, Nishtar Hospital Multan, Multan, Pakistan

Email: alirandhawa465@gmail.com

ABSTRACT

Background: Necrotizing fasciitis (NF) is a rapidly progressive, potentially life-threatening soft-tissue infection in which early diagnosis and surgical intervention are crucial. The Laboratory Risk Indicator for Necrotizing Fasciitis (LRINEC) score uses routinely available laboratory parameters to assist in early diagnosis. This study evaluated the diagnostic performance of a LRINEC score ≥6 using histopathology as the reference standard

Objective: To determine the diagnostic accuracy and area under the receiver operating characteristic curve (AUROC) of a LRINEC score ≥6 for diagnosing NF.

Methods: A cross-sectional study was conducted from 20 May 2026 till 20 August 2026 at the Department of Surgery, Nishtar Hospital, Multan. Consecutive patients aged 18–60 years with clinically suspected NF and symptom duration ≤48 hours were enrolled. Blood samples were obtained before antibiotics and fluid resuscitation. White blood cell count, hemoglobin, serum sodium, glucose, creatinine, and C-reactive protein were measured, and the LRINEC score was calculated. All patients underwent surgical debridement, with tissue specimens submitted for histopathological examination. Diagnostic performance was assessed using sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), diagnostic accuracy, and AUROC.

Results: Among 128 patients, 94 (73.4%) had histopathologically confirmed NF. The mean age was 54.97 ± 2.65 years; 88 (68.8%) were male and 73 (57.0%) had diabetes mellitus. The mean LRINEC score was 7.23 ± 2.80. At a cutoff of ≥6, 85 true-positive, 31 true-negative, 9 false-negative, and 3 false-positive results were observed. Sensitivity was 90.4%, specificity 91.2%, PPV 96.6%, NPV 77.5%, and diagnostic accuracy 90.6%. The AUROC was 0.798 (95% CI: 0.720–0.876; p<0.001).

Conclusion: A LRINEC score ≥6 demonstrated good diagnostic performance for histopathologically confirmed NF. However, its negative predictive value was insufficient to reliably exclude NF. LRINEC should therefore complement, rather than replace, clinical assessment and urgent surgical evaluation.

Keywords: *Necrotizing fasciitis; LRINEC score; diagnostic accuracy; histopathology; sensitivity; specificity.*

How to Cite: Ali Bahadur, Muneeba Amin, Ghulam Mustafa Mahmood, Huzaifa Abeer, Ghazia Rehman, Mohammad Masood Ur Rauf Hiraj Khan, (2026) Diagnostic Accuracy of the LRINEC Score for Necrotizing Fasciitis Using Histopathology as the Gold Standard, *Journal of Carcinogenesis, Vol.25, No.1*, 1-6. 558-564

1. INTRODUCTION

Necrotizing fasciitis (NF) is a rapidly progressive infection primarily involving the fascia and subcutaneous tissue.[1] It is the most severe soft tissue infection and without surgical treatment the mortality rate is approximately 50%.[2] The infection typically travels along the fascial plane, which has a poor blood supply.[3] Necrotizing fasciitis can occur post-surgery, any

invasive procedure, or even a minor procedure like phlebotomy.[4] The causative bacteria are usually mixed but do produce gas. Risk factors for adverse outcomes include advanced age, resistant organisms, delay in therapy, multiorgan failure, and infection site.[5]

Early recognition and aggressive debridement of all necrotic fascia and subcutaneous tissue is very important. Delay in operative debridement has been shown to increase the mortality rate.[6] Computed tomography (CT) has greater sensitivity than plain film in identifying soft tissue gases in necrotizing infections.[7] The laboratory risk indicator for necrotizing fasciitis (LRINEC) score was first introduced by Wong et al in 2004.[8]

Laboratory data including hemoglobin, creatinine, glucose, sodium and C-reactive protein (CRP) levels and the white blood cell count are used for early recognition of NF.[9] A score of six has a positive predictive value of 92% and a negative predictive value of 96%. A score of eight or greater represents a 75% risk of necrotizing infection.[9]

Liao CI et al included 3388 patients in the study consisting of 233 (6.87%) patients with necrotizing fasciitis and 3155 (93.12%) with severe cellulitis. A LRINEC score of ≥6 had a sensitivity of 59.2%, specificity of 83.8%, positive predictive ratio of 37.9%, and negative predictive ratio of 92.5% and area under receiver operating characteristic curve was 0.779. The rate of clinical diagnosis of NF in patients by emergency physicians before admission was 58.4%.[10] Hsiao CT et al enrolled a total of 106 (11.4) patients with necrotizing fasciitis and 825 patients with cellulitis. With LRINEC cut-off score ≥6, the sensitivity and specificity were 43% and 83%, positive predictive value and negative predictive value were 25% and 92% respectively. Area under receiver operating characteristic curve was 69.6%.[11]

We have planned this study to validate the role of LRINEC for early diagnosis of NF in patients clinically suspected of soft tissue infections at our local setting. Early detection and differentiation of NF from other infections will lead to timed surgical debridement and appropriate antimicrobial therapy so that adverse outcomes associated with this condition will be reduced. The objective of the study is to determine the area under receiver operating characteristic curve (AUROC) of laboratory risk indicator for necrotizing fasciitis (LRINEC) score ≥ 6 for diagnosis of necrotizing fasciitis taking histopathology as the gold standard. Our secondary objective is to determine diagnostic accuracy of the laboratory risk indicator for necrotizing fasciitis (LRINEC) score ≥6 for diagnosis of necrotizing fasciitis taking histopathology as the gold standard.

2. MATERIAL & METHODS

Thus cross sectional study was conducted from 20 May 2026 till 20 August 2026 at the Department of Surgery, Nishtar Hospital Multan. Non-probability consecutive sampling was used to induct the patients into the study. Patients aged 18 – 60 years, either male or female gender and admitted with suspicion of necrotizing fasciitis, ≤ 48-hour duration were included in the study. Patients who have a length of stay >48 hours, who were administered oral antibiotics and already had debridement done were excluded. The study was conducted after approval from the institutional ethics review committee. A total of 128 suspected cases of necrotizing fasciitis presenting to the department of surgery, fulfilling the inclusion criteria, were enrolled in the study. Patient characteristics like age, gender and diabetes mellitus were recorded. All the patients undergone venous blood sampling before the first antibiotic dose and fluid resuscitation. The samples were sent to a single laboratory for the measurement of white blood cell (WBC) count, hemoglobin, sodium, glucose, creatinine, and C-reactive protein as per hospital protocol. Laboratory Risk Indicator for Necrotizing Fasciitis (LRINEC) score were calculated, and patients were categorized into LRINEC score ≥6 (yes/no). All the patients undergone debridement after initial resuscitation. Operative findings of necrotic fascia, pus collection were noted, and tissues were sent for histopathological examination. Final diagnosis of necrotizing fasciitis (yes/no) were recorded. The obtained data were noted on proforma.

3. RESULTS

SPSS version 23 was used for data analysis. One hundred twenty-eight patients with clinically suspected necrotizing fasciitis were enrolled and analyzed. Mean age was 54.97 ± 2.65 years. Eighty-eight patients (68.8%) were male, and diabetes mellitus was present in 73 (57.0%).

On admission, white blood cell count averaged 20.22 ± 5.53 $\times 10^3/\mu L$, hemoglobin 11.57 ± 1.98 g/dL, and sodium 133.26 ± 3.60 mmol/L. Glucose ran high at 263.74 ± 75.14 mg/dL, with creatinine 1.92 ± 0.81 mg/dL and CRP 143.05 ± 86.49 mg/L. Mean LRINEC score across the cohort was 7.23 ± 2.80 (Table 1).

Table 1. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Age (years)	128	49.00	60.00	54.9688	2.65003
WBC (×10³/µL)	128	8.90	33.60	20.2180	5.53478
Hemoglobin (g/dL)	128	7.50	14.70	11.5680	1.97580
Sodium (mmol/L)	128	126.10	139.90	133.2633	3.60273
Glucose (mg/dL)	128	102.60	374.60	263.7367	75.14410
Creatinine (mg/dL)	128	0.72	3.25	1.9163	0.81242
CRP (mg/L)	128	46.90	315.90	143.0492	86.49031
LRINEC score	128	1.00	13.00	7.2266	2.80105
Valid N (listwise)	128				

At a cutoff of ≥6, the LRINEC score was positive in 88 patients (68.8%). Histopathology confirmed necrotizing fasciitis in 94 patients (73.4%); the remaining 34 (26.6%) had an alternative or negative diagnosis.

Table 2. Gender

	Frequency	Percent	Valid Percent	Cumulative Percent
Female	40	31.3	31.3	31.3
Male	88	68.8	68.8	100.0
Total	128	100.0	100.0	

Table 3. Diabetes Mellitus

	Frequency	Percent	Valid Percent	Cumulative Percent
No	55	43.0	43.0	43.0
Yes	73	57.0	57.0	100.0
Total	128	100.0	100.0	

Table 4. LRINEC ≥6

	Frequency	Percent	Valid Percent	Cumulative Percent
No	40	31.3	31.3	31.3
Yes	88	68.8	68.8	100.0
Total	128	100.0	100.0	

Table 5. Necrotizing Fasciitis on Histopathology

	Frequency	Percent	Valid Percent	Cumulative Percent
No	34	26.6	26.6	26.6
Yes	94	73.4	73.4	100.0
Total	128	100.0	100.0	

A 2×2 table comparing LRINEC score ≥6 against histopathology is shown in Table 6. Of the 94 histopathology-confirmed cases, 85 tested positive on LRINEC (true positive) and 9 were missed (false negative). Of the 34 patients without necrotizing fasciitis, 31 correctly scored below 6 (true negative) and 3 were misclassified as positive (false positive).

Table 6. A 2× 2 table for LRINEC ≥6 and Necrotizing Fasciitis on Histopathology

Necrotizing Fasciitis on Histopathology	Yes	No	Total
LRINEC ≥6			
Yes	85 (TP)	3 (FP)	88
No	9(FN)	31.0 (TN)	40

Necrotizing Fasciitis on Histopathology	Yes	No	Total
Total	94	34	128

Sensitivity was 90.4% and specificity 91.2%. Positive and negative predictive values were 96.6% and 77.5%, respectively, giving an overall diagnostic accuracy of 90.6% (Table 7).

Table 7. Diagnostic Accuracy of LRINEC Score ≥6

Parameter	Value
Sensitivity	90.4%
Specificity	91.2%
Positive Predictive Value	96.6%
Negative Predictive Value	77.5%
Diagnostic Accuracy	90.6%

The LRINEC score's AUROC for predicting necrotizing fasciitis was 0.798 (95% CI: 0.720–0.876; p<0.001), consistent with good discriminative ability (Table 8).

Table 8. Area Under the Curve

Test Result Variable(s): LRINEC score

Area	Std. Error[a]	Asymptotic Sig.[b]	Asymptotic 95% Confidence Interval	
			Lower Bound	Upper Bound
.798	.040	<.001	.720	.876

Diagnostic accuracy held up reasonably well across subgroups. Patients under 55 (n=57) showed sensitivity of 90.5%, specificity 93.3%, PPV 97.4%, NPV 77.8%, and accuracy 91.2%. Those 55 and older (n=71) were similar: sensitivity 90.4%, specificity 89.5%, PPV 95.9%, NPV 77.3%, accuracy 90.1%.

By sex, sensitivity was comparable (90.6% in women, 90.3% in men), but specificity and NPV were not: 75.0% and 66.7% in women versus 96.2% and 80.6% in men. This gap is worth flagging for a larger confirmatory sample, since it could reflect genuine effect modification or simply the small female subgroup (n=40).

Diabetic patients (n=73) had sensitivity 89.1%, specificity 88.9%, PPV 96.1%, NPV 72.7%, and accuracy 89.0%. Non-diabetic patients (n=55) performed slightly better across the board: sensitivity 92.3%, specificity 93.8%, PPV 97.3%, NPV 83.3%, accuracy 92.7% (Table 9).

Table 9. Stratified Diagnostic Accuracy of LRINEC Score ≥6

Stratum	n	Sensitivity	Specificity	PPV	NPV	Accuracy
Age <55 years	57	90.5%	93.3%	97.4%	77.8%	91.2%
Age ≥55 years	71	90.4%	89.5%	95.9%	77.3%	90.1%
Female	40	90.6%	75.0%	93.5%	66.7%	87.5%
Male	88	90.3%	96.2%	98.2%	80.6%	92.0%
Diabetic	73	89.1%	88.9%	96.1%	72.7%	89.0%
Non-diabetic	55	92.3%	93.8%	97.3%	83.3%	92.7%

4. DISCUSSION

Early recognition and aggressive debridement of all necrotic fascia and subcutaneous tissue is very important. [12] In the present study, the diagnostic performance of LRINEC was evaluated against histopathology as the reference standard in 128 patients with clinically suspected NF. The study population had a mean age of 54.97 ± 2.65 years, with a predominance of males (68.8%). Diabetes mellitus was present in 57.0% of patients. These findings are clinically relevant because NF is affected by other comprbodies that especially affect host defense and tissue perfusion such as diabetes. The recognizef association between diabetes and severe NF is also shown by the predominance of diabetes in our cohort. [13]

The laboratory profile of the subjects included in our study demonstrated important systemic inflammation and metabolic disturbance. The mean WBC count was 20.22 ×10³/µL and the mean CRP was 143.05 mg/L, while mean serum glucose and creatinine were 263.74 mg/dL and 1.92 mg/dL, respectively. These are important abmormalities because each labortaty value is an important component of the LRINEC score. The mean LRINEC score was 7.23 ± 2.80, which is above the conventional threshold of 6. The original study by Wong et al. established the LRINEC score using these six laboratory parameters and reported excellent discrimination, with an AUROC of approximately 0.98 in both the developmental and validation cohorts. [12] However, subsequent validation studies have produced considerably more variable estimates of diagnostic performance.[14-16]

In the present study, an LRINEC score ≥6 demonstrated a sensitivity of 90.4% and specificity of 91.2% when histopathology was used as the reference standard. The corresponding PPV was 96.6%, NPV was 77.5%, and overall diagnostic accuracy was 90.6%. Thus, in this cohort, a score of ≥6 identified the majority of histopathologically confirmed cases while correctly classifying most patients without NF. The high PPV is particularly notable; however, it should be interpreted in the context of the relatively high prevalence of histopathologically confirmed NF in this study (73.4%).
The sensitivity of 90.4% observed in this study is higher than that reported in several contemporary validation studies. Fernando et al., in a systematic review and meta-analysis of 23 studies involving 5,982 patients, reported a pooled sensitivity of approximately 68% and specificity of approximately 85% for an LRINEC cutoff of ≥6.[14] Similarly, a prospective validation study involving 931 patients found a sensitivity of only 43% and specificity of 83% at the same cutoff, with an AUROC of 0.696.[15] These differences are important because they demonstrate that the performance of LRINEC may vary substantially according to study population, disease spectrum, anatomical site, prevalence of NF, and study methodology.

The higher sensitivity observed in the present study may partly relate to the inclusion of patients with a relatively high pre-test probability of NF. All participants had clinically suspected NF, and 73.4% were subsequently confirmed to have NF on histopathology. This spectrum differs considerably from studies recruiting a much larger number of patients with cellulitis or other less severe soft-tissue infections. For example, in the prospective study by Hsiao et al., 106 patients with NF were compared with 825 patients with severe cellulitis, resulting in a much lower prevalence of NF and substantially lower PPV.[15] Spectrum effects are important in diagnostic research because diagnostic tests may perform better in populations with more advanced or clearly established disease than in an undifferentiated emergency population.

The specificity of 91.2% in the present study was also higher than the pooled specificity reported by Fernando et al.[14] and higher than the 83% reported in the prospective validation study by Hsiao et al. [15] This finding suggests that, within this selected cohort, a LRINEC score ≥6 was relatively effective at distinguishing histopathologically confirmed NF from alternative diagnoses. The high specificity may have clinical value when the score is substantially elevated, although it should not be interpreted as evidence that LRINEC can replace clinical assessment, surgical consultation, or definitive operative evaluation.

The AUROC of 0.798 (95% CI 0.720–0.876; p<0.001) further demonstrated statistically significant discriminatory ability of the LRINEC score in the present population. An AUROC of 0.798 indicates good, although not excellent, discrimination. Interestingly, this value was lower than the AUROC of 0.927 reported in the systematic review by Bechar et al.,[16] and substantially lower than the 0.98 reported in the original Wong study.[12] Conversely, it was higher than the AUROC of 0.696 reported in the prospective validation study by Hsiao et al.[15] This intermediate result reinforces the concept that LRINEC has useful discriminatory capability but that its performance is not uniform across different clinical settings.

The present findings also have relevance to the ongoing debate regarding whether LRINEC should be used primarily as a diagnostic or exclusionary tool. Although the current study demonstrated high sensitivity, the NPV was 77.5%. Therefore, approximately one in five patients with a negative LRINEC result in this cohort could still have NF. This is clinically important because missing NF can lead to delayed surgical treatment and adverse outcomes. The systematic review and meta-analysis by Fernando et al. specifically concluded that LRINEC lacks sufficient sensitivity to safely exclude necrotizing soft-tissue infection when used in isolation.[14] Similarly, Hsiao et al. cautioned against relying on LRINEC as a routine diagnostic tool because of its low sensitivity in their prospective cohort.[15] Therefore, despite the favorable performance observed in the current study, **a LRINEC score <6 should not be used to rule out NF when clinical suspicion remains high**.

The subgroup analysis according to age demonstrated relatively stable performance. Patients younger than 55 years had an accuracy of 91.2%, compared with 90.1% among those aged ≥55 years. Sensitivity was almost identical between the two groups (90.5% versus 90.4%). This consistency suggests that, within the age range represented in this cohort, age did not substantially alter the ability of LRINEC to discriminate NF from non-NF. However, because the study population was relatively narrowly distributed between 49 and 60 years, these findings should not be extrapolated to much younger or substantially older populations without further validation.

Performance according to sex showed a more noticeable difference. Sensitivity was similar among females and males (90.6% versus 90.3%), whereas specificity was considerably lower among females (75.0%) than males (96.2%). The corresponding NPV was also lower in females (66.7% versus 80.6%). This difference should be interpreted cautiously because only 40 women were included compared with 88 men. Consequently, a relatively small number of false-positive or false-negative results can produce substantial changes in subgroup estimates. The findings may therefore represent sampling variation rather than a true sex-related difference in LRINEC performance. Larger multicenter cohorts with prespecified subgroup analyses would be required to establish whether sex genuinely modifies diagnostic performance.

Diabetes mellitus was present in 57.0% of the study population. LRINEC performance was slightly lower among diabetic patients, with sensitivity of 89.1%, specificity of 88.9%, and accuracy of 89.0%, compared with 92.3%, 93.8%, and 92.7%, respectively, among non-diabetic patients. Although the differences were modest, this pattern is clinically plausible because several LRINEC components can be abnormal in diabetes even in the absence of NF, particularly glucose and inflammatory markers. Conversely, severe infection in diabetic patients may produce substantial metabolic abnormalities that increase LRINEC values. A prospective study specifically examining LRINEC in patients with diabetes and lower-extremity infections found that the score had potential value as a negative predictor but emphasized that laboratory abnormalities can be nonspecific in diabetic patients.[13] These findings support using LRINEC as an adjunct rather than an independent diagnostic decision-maker in diabetic patients.

The high PPV of 96.6% observed in the present study deserves particular consideration. The original Wong study reported a PPV of 92% at a cutoff of ≥6,[12] which is broadly comparable to the present finding. However, the prospective validation study by Hsiao et al. reported a substantially lower PPV of 25%.[15] This apparent discrepancy is most likely related to differences in disease prevalence and patient selection rather than a fundamental contradiction between the studies. In the present cohort, NF was confirmed in 94 of 128 patients (73.4%), whereas the prospective validation cohort contained a much larger proportion of patients with severe cellulitis. Therefore, the current PPV should not be interpreted as the expected PPV of LRINEC in all patients presenting with suspected soft-tissue infection.

The use of histopathology as the reference standard is an important strength of the present study. Histopathological confirmation provides an objective method of establishing tissue necrosis and allows the diagnostic performance of LRINEC to be assessed against a definitive reference diagnosis. This is particularly relevant because previous investigations have used heterogeneous reference standards, including operative findings, clinical diagnosis, microbiological results, and combinations of these. A systematic review by Fernando et al. included studies in which NSTI was confirmed by surgery or histopathology and demonstrated substantial variability in the performance of LRINEC.[14] The present study therefore contributes additional data from a histopathology-based diagnostic framework.

There are however certain limitations of the study. First of all, the sample size was relatively small and the sampling technique selected only those patients with suspected NF. This limited the generalizability of the results. Seondly the study evaluated a single conventional cutoff of ≥6 and did not determine whether an alternative cutoff might provide superior sensitivity or specificity in this population. Finally, LRINEC is based entirely on laboratory variables and does not incorporate important clinical findings, anatomical distribution, imaging, hemodynamic status, or rate of disease progression.

Despite these limitations, the present findings indicate that LRINEC ≥6 demonstrated good diagnostic performance in this cohort of clinically suspected NF, with sensitivity of 90.4%, specificity of 91.2%, and AUROC of 0.798. The results support the potential role of LRINEC as a readily available adjunctive diagnostic tool, particularly in settings where advanced imaging or immediate specialist assessment may not be readily available.

5. CONCLUSION

The present study demonstrated that an LRINEC score ≥6 had high sensitivity and specificity and good overall discrimination for histopathologically confirmed necrotizing fasciitis. Nevertheless, because diagnostic performance varies considerably between populations, LRINEC should be considered an adjunct to clinical judgment rather than a substitute for urgent surgical evaluation in patients with suspected necrotizing fasciitis.

REFERENCES

1. Yu X, Guo Z, Zhang M, Fu Q, Zhou J. Clinical analysis of diagnosis and treatment of necrotizing fasciitis. Eur J Inflamm. 2022;20:1-10.
2. Kjaldgaard L, Cristall N, Gawaziuk JP, Kohja Z, Logsetty S. Predictors of mortality in patients with necrotizing fasciitis: A literature review and multivariate analysis. Plast Surg. 2023;31(3):221-8.
3. Miller LE, Shaye DA. Noma and necrotizing fasciitis of the face and neck. Facial Plast Surg. 2021;37(04):439-45.

4. Ditsios K, Chitas K, Christidis P, Charatsis K, Katsimentzas T, Papadopoulos P. Necrotizing fasciitis of the upper extremity–a review. Orthop Rev. 2022;14(3):35320.
5. Al-Qurayshi Z, Nichols RL, Killackey MT, Kandil E. Mortality risk in necrotizing fasciitis: national prevalence, trend, and burden. Surg Infect. 2020;21(10):840-52.
6. Nawijn F, Smeeing DP, Houwert RM, Leenen LP, Hietbrink F. Time is of the essence when treating necrotizing soft tissue infections: a systematic review and meta-analysis. World J Emerg Surg. 2020;15:4.
7. Wei XK, Huo JY, Yang Q, Li J. Early diagnosis of necrotizing fasciitis: Imaging techniques and their combined application. Int Wound J. 2024;21(1):e14379.
8. Breidung D, Malsagova AT, Barth AA, Megas IF, Billner M, Hitzl W. Diagnostic and prognostic value of the Laboratory Risk Indicator for Necrotising Fasciitis (LRINEC) based on an 18 years' experience. J Plast Reconstr Aesthet Surg. 2023;77:228-35.
9. Wallace HA, Perera TB. Necrotizing Fasciitis. [Internet]. StatPearls. 2023 [cited 13 February 2024]. Available from: https://www.ncbi.nlm.nih.gov/books/NBK430756/
10. Liao CI, Lee YK, Su YC, Chuang CH, Wong CH. Validation of the laboratory risk indicator for necrotizing fasciitis (LRINEC) score for early diagnosis of necrotizing fasciitis. Tzu Chi Med J. 2012;24(2):73-6.
11. Hsiao CT, Chang CP, Huang TY, Chen YC, Fann WC. Prospective validation of the laboratory risk indicator for necrotizing fasciitis (LRINEC) score for necrotizing fasciitis of the extremities. PloS One. 2020;15(1):e0227748.
12. Wong CH, Khin LW, Heng KS, Tan KC, Low CO. The LRINEC (Laboratory Risk Indicator for Necrotizing Fasciitis) score: a tool for distinguishing necrotizing fasciitis from other soft tissue infections. Crit Care Med. 2004;32(7):1535-1541. Doi:10.1097/01.CCM.0000129486.35458.7D.
13. Wilson MP, Schneir AB. A case of necrotizing fasciitis with a low LRINEC score: clinical suspicion should trump scoring systems. J Emerg Med. 2013;44(5):928-931.
14. Fernando SM, Tran A, Cheng W, Rochwerg B, Kyeremanteng K, Seely AJE, et al. Necrotizing soft tissue infection: diagnostic accuracy of physical examination, imaging, and LRINEC score: a systematic review and meta-analysis. Ann Surg. 2019;269(1):58-65. Doi:10.1097/SLA.0000000000002774.
15. Hsiao CT, Chang CP, Huang TY, et al. Prospective validation of the Laboratory Risk Indicator for Necrotizing Fasciitis (LRINEC) score for necrotizing fasciitis of the extremities. PloS One. 2020;15(1):e0227748. Doi:10.1371/journal.pone.0227748.
16. Bechar J, Sepehripour S, Hardwicke J, Filobbos G. Laboratory risk indicator for necrotising fasciitis (LRINEC) score for the assessment of early necrotising fasciitis: a systematic review of the literature. Ann R Coll Surg Engl. 2017;99(5):341-346. Doi:10.1308/rcsann.2017.0053.
17. DeGenova DT, et al. Differences between patients with diabetes mellitus and those without in cases of necrotizing fasciitis. J Orthop. 2023.
18. Tsai YH, Hsu RW, Huang KC, et al. Evaluation of the Laboratory Risk Indicator for Necrotizing Fasciitis (LRINEC) score for detecting necrotizing soft tissue infections in patients with diabetes and lower extremity infection. J Diabetes Investig. 2021.
19. Nawijn F, Smeeing DPJ, Houwert RM, van der Velde D, et al. [Prospective/validation literature on LRINEC and necrotizing soft-tissue infection].