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VALIDATION OF LRINEC SCORING SYSTEM FOR DIAGNOSIS OF NECROTIZING FASCIITIS IN PATIENTS PRESENTING WITH SOFT TISSUE INFECTIONS

General Surgery

KEYWORDS:

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ABSTRACT

INTRODUCTION: Necrotising fasciitis is one the highly lethal infections that causes rapidly spreading necrosis of fascia and subcutaneous tissue which leads to high morbidity and mortality. With early diagnosis, outcome can be much improved so that long term disability can be significantly reduced or prevented.

AIM: To validate the LRINEC scoring system for the diagnosis of necrotising fasciitis among patients with soft tissue infections.

METHODS: This was a prospective study which included patients who were admitted with soft tissue infections in Govt. Rajaji hospital, Madurai for a period of one year. These patients were subjected to LRINEC scoring system and results were interpreted.

RESULTS: The present study comprised of 76 cases who were presented with necrotizing soft tissue infections as per the inclusion and exclusion criteria. Male gender, older age group predominantly in soft tissue infections.Present study showed that LRINEC score is capable of detecting early cases of necrotizing fasciitis among patients with severe soft tissue infections. Positive predictive value for the LRINEC scoring system was 94.7% with a sensitivity value of 95.6% in the present study. 51 patients with soft tissue infections were debrided based on LRINEC scoring system.

CONCLUSION: Early operative debridement was demonstrated to reduce mortality among patients with this condition. The LRINEC score is a robust index that is capable of detecting early cases of necrotizing fasciitis and is simple enough for routine use. LRINEC scoring system is an important adjunctive tool in diagnosing necrotizing soft tissue infections.

INTRODUCTION:

Necrotizing fasciitis (NF) is a rapidly progressive infection primarily involving the fascia and subcutaneous tissue. It is the most severe soft tissue infection and without surgical treatment the mortality rate is approximately 50%. Early recognition and aggressive debridement of all necrotic fascia and subcutaneous tissue are very important. Delay in operative debridement has been shown to increase the mortality rate [1-7]. 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.. Most studies validated the score system for Vibrio necrotizing soft-tissue infection [9-11]. Two studies discussed its prognostic value with NF [12,13]. We collected hospital data from govt rajaji hospital to further validate whether the LRINEC score can be used for early recognition of NF.

Methods and Materials

76 patients admitted to the govt Rajaji hospital,Madurai, with the symptoms of soft tissue infections for the period of last one year were included in the prospective study . We obtained approval from the hospital administrators and ethical committee to conduct this study and received the participant's written consent. Patients presenting with soft tissue infections were clinically examined and subjected to a proforma. LRINEC scoring system was applied to each patient with soft tissue infections.

Value	LRINEC score points
C reactive protein, mg/L	
<150	0
>150	4
WBC count, cells/mm³	
<15	0
15-25	1
>25	2
Haemoglobin level, g/dL	
>13.5	0
11-13.5	1
<11	2
Sodium level, mmol/L	
≥ 135	0
< 135	2
Creatinine level, mg/dL	
≤ 1.6	0
> 1.6	2
Glucose level, mg/dL	
≤ 180	0
> 180	1

LRINEC: Laboratory risk indicator for necrotizing fasciitis

Fig.1 LRINEC SCORE

Results

TABLE-1: Table shows CRP significance in the study. 28 patients were CRP level >150 mg/L out of 76 patients.

CRPvs DEBRIDEMENT		DEBRIDED(+)	NON DEBRIDE(-)	Total	%
< 150	48	26	22	48	63.16
> 150	28	25	3	28	36.84
Total	76	51	25	76	100.00

TABLE-2: Table showing increased total count among patients with soft tissue infections.

TC vs DEBRIDEMENT		DEBRIDED(+)	NON DEBRIDE(-)	Total	%
< 15	18	8	10	18	23.68
15 - 25	51	38	13	51	67.11
> 25	7	5	2	7	9.21
Total	76	51	25	76	100.00

TABLE-3: Table shows significance of anemia among patients with soft tissue infection.

HB vs DEBRIDEMENT		DEBRIDED(+)	NON DEBRIDE(-)	Total	%
> 13.5	12	9	3	12	15.79
11 - 13.5	28	16	12	28	36.84
< 11	36	26	10	36	47.37
Total	76	51	25	76	100.00

TABLE-4: Table shows relevance of serum sodium among the study group.

Na vs DEBRIDEMENT		DEBRIDED(+)	NON DEBRIDE(-)	Total	%
> 135	37	21	16	37	48.68
< 135	39	30	9	39	51.32
Total	76	51	25	76	100.00

TABLE-5: Table shows relevance of Sr.creatinine among the study group.

Cr vs DEBRIDEMENT		DEBRIDED(+)	NON DEBRIDE(-)	Total	%
< 1.6	39	28	11	39	51.32

> 1.6	37	23	14	37	48.68
Total	76	51	25	76	100.00

TABLE-6: Table shows relevance of random blood sugar value among the study group.

LRINEC vs DEBRIDEMENT		DEBRIDED (+)	NON DEBRIDE(-)	Total	%
< 180	53	30	23	53	69.74
> 180	23	21	2	23	30.26
Total	76	51	25	76	100.00

TABLE-7: Table shows the LRINEC score for the study group

LRINEC vs DEBRIDEMENT		DEBRIDED(+)	NON DEBRIDE(-)	Total	%
<6		20	25	45	44.40
>6		31	0	31	100.0
Total		51	25	76	100.0

TABLE-8:Table shows importance of LRINEC score in diagnosing necrotising fasciitis from other soft tissue infections.

LRINEC vs DEBRIDEMENT	cellulitis	F.G	NF	Total	%
<6	45	25	6	14	50	26.32
>6	31	0	4	27	31	40.79
Total	76	25	10	41	76	100.0

FIG-2: Cylindrical chart shows significance of LRINEC score in diagnosing N.F

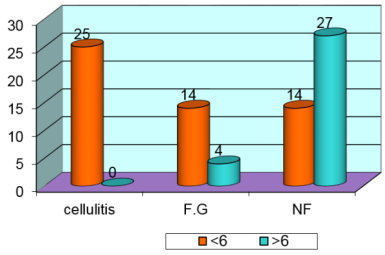
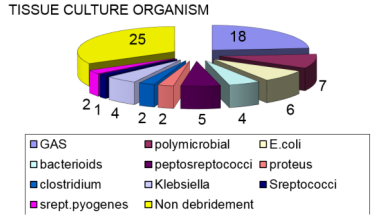


FIG-3: Figure shows tissue culture report for the study group.



DISCUSSION

The developmental study by Wong et al reported that a LRINEC score 6 or >6 had a sensitivity of 89.9%, specificity of 96.9%, positive predictive value of 92.0% and negative predictive value of 96.0% [8]. In 2009, Holland studied a group of 28 patients who had received surgery because of suspected NF. Ten patients were diagnosed with NF postoperatively. The results showed a sensitivity of 80%, specificity of 67%, positive predictive value of 57% and negative predictive value of 86% [9]. The present study comprised of 76 cases which presented with necrotizing soft tissue infections as per the inclusion and exclusion criteria. Present study showed that LRINEC score is capable of detecting early cases of necrotizing fasciitis among patients with severe soft tissue infections.

Positive predictive value for the LRINEC scoring system was 94.7% with a sensitivity value of 95.6% in the present study. 51 patients with soft tissue infections were debrided based on LRINEC scoring system. Common organisms like group A strpto cocci and poly microbial , pepto srepto cocci are involved in the tissue culture.

SUMMARY AND CONCLUSION

The present study comprised of 76 cases which presented with necrotizing soft tissue infections as per the inclusion and exclusion criteria.

- Present study showed that LRINEC score is capable of detecting early cases of necrotizing fasciitis among patients with severe soft tissue infections.
- Positive predictive value for the LRINEC scoring system was 94.7% with a sensitivity value of 95.6% in the present study. 51 patients with soft tissue infections were debrided based on LRINEC scoring system.
- Laboratory investigations required for the LRINEC scoring system are done on a routine basis for patients with soft tissue infections. These investigations were cheap and were readily available in the study area for the present study.
- Patients in the present study were stratified into high-, moderate-, and low-risk categories based on the LRINEC score for serious soft tissue infections warranting admission, intravenous antibiotics, and immediate further evaluation and allocation of resources.
- Common organisms like group A strpto cocci and poly microbial , pepto srepto cocci are involved in the tissue culture.
- LRINEC scoring system is helpful in stratifying patients into risk categories of possibility of necrotizing fasciitis, allocating resources and ultimately aiding in the early recognition of necrotizing fasciitis.
- The LRINEC score is essentially a measure of the biochemical and hematologic disturbances associated with systemic inflammatory response syndrome.
- Other soft tissue infections such as cellulitis and abscesses rarely cause an inflammatory state severe enough to cause such disturbances in the laboratory variables.
- The LRINEC score is a robust index that is capable of detecting early cases of necrotizing fasciitis and is simple enough for routine use.
- LRINEC scoring system is an important adjunctive tool in diagnosis of necrotizing soft tissue infections.

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