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General Surgery

ROLE OF LRINEC SCORE IN MANAGEMENT OF SOFT TISSUE INFECTIONS

Durai Rajan Thiyagarajan	Assistant Professor, Department Of General Surgery, K.A.P.V Government Medical College, Trichy.
Rajeswari Appanamuthu Mari*	Senior Resident, Department Of General Surgery, K.A.P.V Government Medical College, Trichy. *Corresponding Author
Durairajan Vaithiyanathan	Junior Resident, Department Of General Surgery, K.A.P.V Government Medical College, Trichy.
Aravamudhan Vasudevan	Junior Resident, Department Of General Surgery, K.A.P.V Government Medical College, Trichy.

ABSTRACT **OBJECTIVE:** Necrotising fasciitis is a surgical emergency. Early operative intervention makes a reliable outcome. LRINEC score was introduced in 2004 for the early recognition of necrotizing fasciitis.We collected our Hospital data to validate LRINEC scoring system for diagnosis of necrotizing fasciitis among soft tissue infections. **MATERIAL AND METHODS:** This is a prospective observational study conducted in Mahatma Gandhi Government Hospital, Trichy. Patient presenting with symptoms suggestive of soft tissue infection will undergo clinical examination and investigations. LRINEC score applied for each study subjects. Confirmatory diagnosis for necrotizing fasciitis were done from histopathology of all patients. Patient followed up for 3 months. **CONCLUSION:** Surgical debridement is the primary treatment of necrotizing fasciitis and antimicrobial therapy constitutes adjuvant therapy. LRINEC score identify high risk patients to guide novel therapeutic strategy to identify patient for future trials.

KEYWORDS : Laboratory Risk Index For Necrotizing Fasciitis, Soft Tissue Infections

INTRODUCTION

Necrotising fasciitis is a group of highly lethal infections that causes rapidly spreading necrosis of fascia and subcutaneous tissues, sometimes involving muscles and skin. Mixed pattern of organisms are responsible: coliforms, staphylococcus, bacteroides spp., anaerobic streptococci and peptostreptococci all been implicated acting in synergy. Patients are almost always immunocompromised with conditions such as Diabetes mellitus. The wound initiating the infection may have been minor, but severely contaminated wounds are more likely to be the cause.

The key to successful treatment lies in early diagnosis and appropriate management. This condition is catastrophic if missed. Even with surgery mortality is 20- 40%. Delay in diagnosis increases mortality, and those who survive need more extensive surgery, reconstruction and often amputation.With early diagnosis outcome is much improved and significant long-term disability is reduced or prevented.

76 patients including both males and females with the diagnosis of soft tissue infections were studied and various conclusions arrrived accordingly.

MATERIALS AND METHODS

Patients presenting with soft tissue infections were clinically examined and subjected to proforma. LRINEC scoring system was applied to each patient with soft tissue infections in accordance with the infection and exclusion criteria of the study after getting informed and written consent.

Patients presenting with soft tissue infections during the course of study were included.

Patients below 15 years or above 75 years, patients undergone surgical debridement previously, patients with boils or furuncle with no evidence of cellulitis were excluded

DEMOGRAPHIC DATA OF STUDY GROUP

PARAMETERS	PERCENTAGE(%)
Male	77.6
Female	22.3
Diabetic <180mg/dL	69.7
>180mg/dL	30.3
Hb(g/dL) >13.5	15.7
11 -13.5	36.8
<11	47.3
Elevated CRP <150	63.1
>150	36.8
Total count <15000	23.7
15000-25000	67.1
>25000	9.2
Sodium(mEq/L) >135	48.7
<135	51.3
Creatinine SS<1.6	51.3
>1.6	48.7

DISCUSSION

Necrotiing fasciitis is an infection of the deeper tissues that results in progressive destruction of the muscle fascia and overlying subcutaneous fat. Muscle tissue is frequently spared because of its generous blood supply.(1) Infection typically spreads along the muscle fascia due to its relatively poor blood supply initially the overlying tissue can appear unaffected.(2) It is this feature that makes necrotizing fasciitis difficult to diagnose without surgical intervention. Early recognition of necrotizing infection is critical.(3) Rapid progression to extensive destruction can occur leading to systemic toxicity,limb loss and or death. Both clinical clues and diagnostic tools should be used in combination to help make an early diagnosis.(4)

Thus many studies have reported on diagnosis of soft tissue infections. The most accurate diagnostic scoring system to date is the Laboratory Risk Indicator for Necrotizing Fasciitis score (FIGURE.1) of more than or equal to 6 was 93 % sensitive and 92% specific for necrotizing fasciitis in Singaporean population but achieved only 74% sensitivity and 81% specificity in UK validation study (H Y Sultan et al, unpublished UK data, 2011).(5)

Mainstay for investigation and treatment remains surgical exploration. The decision to explore the soft tissues should be made early. An incision over the site of maximal skin change is needed to assess the underlying tissues.(6) Healthy subcutaneous fat and fascia indicates that for the resection is not needed, and the morbidity to the patient is limited to a short scar.(7)

However if exploration shows necrotic fascia, fat or the “dishwater” appearance of liquefied necrotic tissue reception can be done until healthy tissues are reached. This can be facilitated by the “finger sweep test” (necrotic fascia loses its adherence to surrounding tissues and the plane opens abnormally easily until the limit of the disease is reached.(8) Where doubt over the appearances persists, send

specimens for histology to look for evidence of necrosis and microbiology for culture and Gram staining.(9)

Having established the diagnosis, treatment should be instituted immediately. The patient should be resuscitated according to his or her clinical state and may even require Intensive Care support. Intravenous antibiotics should be started at the same time and be changed according to sensitivity. Patient should be taken to theatre without delay and have aggressive surgical debridement. Further surgical exploration 24 to 48 hours later is mandatory to ensure that infectious process has not extended.(10) Repeated debridement may be necessary (as dictated by the state of the wound) until the infection has been controlled adequately. The goal of operative management is to perform aggressive debridement of all necrotic tissue until healthy viable bleeding tissues is reached.(11) Tissue obtained in the operating room should be sent for gram stain and culture.Subsequently, the wound is covered with a sterile dressing, re-evaluated in the operating room approximately 24 hours later, and aggressively debrided again if necrotic tissue is present. The wound is closed after all necrotic tissue is completely debrided.(12)

In present study in 76 patients, relation of LRINEC score in diagnosis of severity of soft tissue infections depicted.Relation of LRINEC scoring and mortality of patients with soft tissue infections predicted.And finally LRINEC scoring and histopathology outcomes after debridement were also studied.

CONCLUSION

Necrotising soft tissue infections are relatively infrequent but highly lethal infections. They encompass a wide variety of soft tissue infections associated with necrosis that shares the same diagnostic and treatment principles. In our study, patients with LR score less than 6 having less severe infections and also their mortality rate is low when compared to patients with LR score more than 6.Establishing the diagnosis of necrotizing soft tissue infections is one of the biggest challenges in treating patients with necrotizing soft tissue infections. Surgical debridement is the primary means of treating necrotizing soft tissue infections and antimicrobial therapy and physiologic monitoring and support constitutes adjuvant therapies. LRINEC score that identify high risk patients serve to guide novel therapeutic strategy and to identify patients for future trials

FIGURE.1.LRINEC score

Variable, Units	β	Score
C-Reactive Protein, mg/L		
<150	0	0
≥150	3.5	4
Total white cell count, per mm^3		
<15	0	0
15–25	0.5	1
>25	2.1	2
Hemoglobin, g/dL		
>13.5	0	0
11–13.5	0.6	1
<11	1.8	2
Sodium, mmol/L		
≥135	0	0
<135	1.8	2
Creatinine, μmol/L		
≤141	0	0
>141	1.8	2
Glucose, mmol/L		
≤10	0	0
>10	1.2	1

FIGURE.2. Table shows HPE results for the operated group.

LRINEC vs HPE		coagulous necrosis	necrosed skin, fascia	neutrophils infilration	NIL	Total	%
<6	45	4	12	4	25	45	59.21
>6	31	6	15	10	0	31	40.79
Total	76	10	27	14	25	76	100.00

FIGURE.3.Table shows importance of LRINEC score in diagnosing necrotising fasciitis from other soft tissue infections.

LRINEC vs Diagnosis		cellulitis	Fournier's gangrene	Necrotising fasciitis	Total	%
<6	45	25	6	14	50	26.32
>6	31	0	4	27	31	40.79
Total	76	25	10	41	76	100.00

FIGURE.4. Table shows significance of LRINEC score in reducing mortality among study group.

LRINEC vs MORTALITY	ALIVE	DEAD	Total	%
<6	45	45	0	45	59.21
>6	31	27	4	31	40.79
Total	76	72	4	76	100.00

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