Original Research Article

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The association between laboratory risk indicator for necrotizing fasciitis score with clinical signs and symptoms of necrotizing fasciitis: a retrospective study

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ABSTRACT

Background: The term necrotizing soft tissue infection encompassing simple pyoderma to life threatening infection, varying with regards to anatomical location, tissue involvement and offending organism. Early diagnosis of necrotizing-STI is important for timely surgical intervention, but physical findings can vary, so misdiagnosis is common. By using WBC, CRP, haemoglobin, Na, creatinine, glucose and clinical examination we can distinguish NF from other STI.

Methods: This was a retrospective and randomized study in the Geetanjali Medical College and Hospital affiliated to Geetanjali University from January 2017 to January 2019 during this period total 66 patients with soft tissue Infection were admitted and included. Clinical details and investigations were recorded from the case sheet and were analyzed with WBC, CRP, Hb, Na, creatinine and glucose.

Results: The most commonly affected age group was 46-60 years with male preponderance. Most common cause of STI was Trauma 66.66% of the patients having Primary Site Lower Limb in 12.12% and as per LRINEC score 50% of the patients have low risk, 37.87% of the patients have high risk and strongly in favour of NF and 12.12% of the patients have intermediate risk.

Conclusions: The LRINEC score is a good tool for NF risk stratification and patients are advised to be careful for presence of NF if LRINEC score is≥6.

Keywords: Laboratory risk indicators of necrotizing fasciitis, Necrotizing fasciitis, Poly microbial infections, Soft tissue infection

INTRODUCTION

Necrotizing fasciitis (NF) is a fulminating soft tissue infection, generally caused by virulent bacteria producing toxins. It encompasses simple pyoderma to life threating Infection varying according to anatomical location, tissue involvement and offending organism. Earliest record of necrotizing fasciitis was described by Baurienne, who in 1764 described progressive soft tissue necrotizing gangrene of male genitalia. It was 1st described by Jones in 1871 and coined it as hospital gangrene. It is

associated with a fulminant course and high mortality. These infections are characterized by rapidly progressive inflammation and necrosis. Clinical course of the infection process is influenced by the virulence of the microbes and of the inoculum, complicating even the most minor elective or emergency procedures for trauma. Deep fascia is the primary site of pathology but subsequently Fasciia and muscles get involved.³ Early local symptoms pain, erythema, swelling, skin color changes, bronzed skin and Induration. Crepitation is present in case of infection by gas producing organism.⁴

Rupture of thin vessels leads to epidermolysis, dermal gangrene.⁵

Systemic manifestation altered mental state, confusion, tachycardia, tachypnea, fever, leukocytosis, hyperglycemia, metabolic acidosis, sepsis. The LRINEC score is a robust score capable of detecting even clinically early cases of necrotizing fasciitis. The variables used are routinely measured to assess severe soft tissue infections. Patients with a LRINEC score of>6 should be carefully evaluated for the presence of NF.5

- Maximum score-13.
- Score of >/6 raise the suspicion of necrotizing fasciitis.
- Score of >/8 strongly predictive of this disease.

Factors of LRINEC score		Points
CRP (mg/l)	<150	O
	≥150	4
Leucocytes (×10°/l)	<15	0
	15–25	1
	>25	2
Hemoglobin (g/dl)	>13.5	О
	11-13.5	1
	<11	2
Sodium (mmol/l)	≥135	О
	<135	2
Creatinine (mmol/l)	≤141	0
	>141	, 2
Glucose (mmol/l)	≤10	0
	>10	1

Figure 1: LRINEC scores with point distribution.

METHODS

This study was conducted as a retrospective and randomized study in the department of general surgery, Geetanjali Medical College and hospital affiliated to Geetanjali University from January 2017 to January 2019 during this period 66 patients with soft tissue Infection came to hospital were included in the study. Ethical clearance taken from Geetanjali University on 1 February 2019 GU/HREC/EC/2019/16.

Inclusion criteria

Patient with necrotizing soft tissue infection irrespective of age, sex, race, location of infection, patient of DM, neurological disease, vascular disorders like PVD, DVT etc. patients with history of trauma, prior surgery, intravenous drug abusers, a transfer of patient with necrotizing soft tissue infection will be defined as initially evaluated at other institution then sent tour institution prior to surgical debridement were included in the study.

Exclusion criteria

Burn patients, patient who had undergone radiotherapy or cancer chemotherapy, patients with family history of atopy, hypersensitivity and adverse drug reactions, all patients with CKD were excluded from the study.

Clinical details and investigations were recorded from the case sheet and were analyzed with WBC, CRP, Hb, Na, creatinine and glucose.

RESULTS

Table 1: Distribution according to composite score.

Composite score (LRINEC)	No. of patients	Percentage	Risk category
<6	33	50	Low
6-7	8	12.12	Intermediate
≥8	25	37.87	High
Total	66	100	

Total 50% of the patients have low risk factor (as their composite score is less than 6), 37.87% of the patients have high risk factor and strongly in favour of Necrotizing Fasciitis (as their composite score is less than or equal to 8) and 12.12% of the patients have Intermediate risk factor (as their composite score lies between 6-7).

Table 2: Distribution according to age.

Age in years	No. of patients	Percentage
15-30	7	10.6
31-45	14	21.21
46-60	22	33.33
61-75	19	28.78
Above 75	4	6.06
Total	66	100

Here, 33.33% patients were in age group 46-60 years, followed by 28.78% patients were in age group 61-75 years, 21.21% patients in age group 31-45 years, 10.6% patients in age group 15-30 years and 6.06% patients in age group above 75 years. 80.31% male and 19.69% female with male preponderance is seen.

Table 3: Distribution according to gender.

Gender	No. of patients	Percentage
Female	13	19.69
Male	53	80.31
Total	66	100

Table 4: Primary site involved.

Primary site	No. of patients	Percentage
B/L L.E	6	9.09
LE	44	66.66
Perineal	8	12.12
U.E	8	12.12
Total	66	100

Total 66.66% of the patients having primary site (LE), 12.12% of the patients having primary site (perineal), 12.12% of the patients having primary site (U.E) and 9.09% of the patients having primary site (B/L L.E).

DISCUSSION

In our study, 33.33% patients were in age group 46-60 years, followed by 28.78%. Patients were in age group 61-75 years, 21.21% patients in age group 31-45 years, 10.6% patients in age group 15-30 years and 6.06% patients in age group above 75 years. Mean age in our study is 53.64 (±15) 64 years. A similar study was done by Narayanswamy et al in the study 100 samples were observed from patients having soft tissue infections, who were included in the study that was based on the inclusion and exclusion criteria that is explained earlier. Observation showed that most common age group 40-60 years, while 61-70 years was the 2nd most common age group. Mean age group was 55.40±14.00 years.

Anaya et al has reported that NF commonly occurs in male with a ratio between male and female as 3:1, more frequently effecting the extremities.8 This can be attributed to the increased prevalence of practices like smoking, and diabetes among males compared to females. It was observed by Goldstein et al that male category was majorly dominating patients' sample with a 76% male and female 24% respectively. Resulting that the incidence of NF is higher in males when compared to females whereas in our study 80.31% male and 19.69% female with male preponderance which are almost similar. In our study we found 83.3% sensitivity, 76.67% specificity and with accuracy of 80.30%. These results are comparable with Wong et al with 89.9% sensitivity, 96.9% specificity and with accuracy of 81.08%. Therefore, LRINEC score has an impressive ability to predict need for early surgical intervention in NF group to decrease the morbidity and mortality associated with it.

Swain et al conducted a retrospectives study in 15 patient of NF the median age group was 51 years and 2/3rd were male. The incidence was more common on lower extremity and the organism isolated is group A *Streptococcus* in our study 80.31% male and 19.69% female with male preponderance which are almost similar.¹⁰

CONCLUSION

The LRINEC score is a good tool for NF risk stratification and patients are advised to be careful for

presence of NF if LRINEC score is ≥6. Always surgical emergency is noted in case of NF the correlation that exists between the statistically significant Modified LRINEC scoring system and prognosis of necrotizing fasciitis is very useful in decreasing mortality.

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