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SHORT ARTICLE

Necrotiziting Facsiitis – A Case Series

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Abstract:

Necrotizing Fasciitis is a rapidly progressing soft tissue infection primarily involving the superficial fascia and subcutaneous tissue. In this case series, we reviewed the clinical presentation of the Necrotising fasciitis cases, the critical role of early diagnosis, to assess the important predictor of mortality and importance of LRINEC scores in proven cases. The data was collected prospectively and retrospectively for 16 consecutive patients who were admitted at our institution with Necrotising Fascitis between January 2010 and April 2018. Patients were subdivided in to two sub groups, survived (n= 12) and deceased (n=4).The both groups were assessed in terms of age, gender, predisposing factors and the difference between the LRINEC score. Age ranged from 30 to 77 years (average age 54.6). The most common associated comorbidity was DM in 6, followed by IVDU in 3 patients. We noted mean LRINEC score 9.5 in those patients who survived and 9.75 with mortality group. Group statistics revealed the age is an important factor for predicting high mortality and diabetes mellitus being the most common comorbid condition. We noted that streptococci and staphylococci remain the virulent and commonest organism. We noted that LRINEC score is an important to predict the morbidity and mortality as the mean score was 9.5 (range 6-12), but no significant difference in the LRINEC score noted in the deceased vs survived group. We strongly recommend the high clinical suspicion, prompt investigations and resuscitation with appropriate antimicrobial therapy followed by expedited surgical debridement to reduce the morbidity and mortality.

Keywords: Necrotising fasciitis, Mortality, Morbidity, LRINEC score

Introduction

Necrotising fasciitis is a rare but potentially fatal disease [1]. Necrotizing Fasciitis (NF) is a rapidly progressing soft tissue infection primarily involving the superficial fascia and subcutaneous tissue. It is caused by Streptococcus pyogens or polymicrobial infection of aerobic and facultative anaerobic bacteria. NF has been divided into four types based on the organism [2]. Type I is Poly microbial and usually caused by an Aerobic and facultative anaerobic bacteria. Type II is monomicrobial caused by Group A β-hemolytic streptococci. Type III is caused by gram negative rods of marine origin, Marine Vibrio vulnificus and Type IV is caused by MRSA.

However, it is difficult to differentiate from other superficial skin conditions such as cellulitis, bruising secondary to the trauma [3]. The physicians must have a high level of suspicion and low threshold for surgical referral when encountered with cases of pain, fever, and erythema.

In this case series, we aim to review the clinical presentation of the Necrotising fasciitis cases, the critical role of early diagnosis, to assess the important predictor of mortality and importance of LRINEC scores in proven cases, the need for urgent surgical intervention and the outcome.

Methods

The data was collected prospectively and retrospectively from the computerised and file records for 16 consecutive patients who were admitted in our hospital for limb Necrotising Fascitis between January 2010 and April 2018. We excluded diabetic foot infections, extensive skin cellulitis conditions which are well known to the health care providers and Considered as necrotizing cellulitis extending deeper in than the skin and subcutaneous tissues. All patients were clinically assessed, investigated and considered for immediate surgical debridement.

Patients were subdivided in to two sub groups, survived (n= 12) and deceased (n=4).

The both groups were assessed in terms of age, gender, predisposing factors and the difference between the LRINEC score.The Collected data included patient's demographics, clinical presentations, site of infection, type of comorbidities, microbiological and laboratory findings. Necrotising Fascitis was diagnosed with high index of clinical suspicion and laboratory assessment on arrival and during the hospital stay with repeated clinical and other investigations. When clinical assessment and surgical exploration were equivocal, the final diagnosis of NF in our study was made based on confirmatory histopathologic analysis. Also, a Gram staining at primary debridement is obtained and intraoperative tissue samples were sent to confirm the pathogen for appropriate antimicrobial therapy. LRINEC score was calculated using laboratory results of six parameters C-reactive protein (CRP), white blood cell count, Haemoglobin, sodium level, creatinine and glucose levels (Table 2). The use these parameters to classify the results gives us better understanding of the epidemiology.

The debridement is the key of the surgical management. The debridement was performed under general anaesthesia. Prior to incision, skin markings were drawn to delineate the healthy skin. A full thickness incision was made down to muscle.

The deep fascia was identified and a clinical diagnosis of necrotising fasciitis was made based on the intraoperative soft tissue findings. The extent of involvement was determined by probing the deep fascia layer. The debridement was extended proximally in a longitudinal manner until healthy fascia adherent to the overlying sub-cutaneous tissue and underlying muscle was identified. The soft tissue specimen was sent for aerobic/ anaerobic cultures and histology. In the cases where the isolated limb was involved, consideration was given to the early decision of amputation to improve the morbidity and mortality.

The data was analysed by using the IBM SPSS statistical software.

Table 1 - Illustrates the details of the patients

Age	Sex	Fever	Wcc	Co-morbidity	LRINEC score	Site	Organism	outcome
33	M	39	27.5	IVDU, Hep C	10	Leg	strepto milleri, mixed anaerobes	Recovered
30	F	38.9	17.2	IVDU	9	Leg	strepto milleri, mixed anaerobes	Recovered
65	M	39.4	16.1	DM	11	Leg	strepto milleri, mixed anaerobes	Recovered
76	M	38.8	4.7	DM	10	arm	Streptococci	Died
77	M	39.1	8.6	DM	7	Leg	serretia marcescens	Died
53	M	39.3	39.8	DM	11	Leg	mixed anaerobes	Recovered
68	F	39.2	1.6	nil	7	leg	staph epi, e coli	Recovered
53	M	39.5	31.3	nil	10	arm	Strepto A, Staph aureus	Recovered
39	M	39.1	19.4	nil	9	Leg	Staph aureus, mixed anaerobes	Recovered
62	F	38.9	22	nil	11	Leg	Strepto	Died
47	M	39.3	8.2	nil	6	Leg	Staph aureus	Recovered
67	M	38.9	9	DM	11	arm	Staph aureus	Recovered
51	M	39	22	snake bite	10	arm	serretia marcescens, mixed coliforms	Recovered
37	M	39.9	22.1	IVDU	12	arm	strepto milleri	Recovered

68	M	39.6	1.5	Ca colon on Chemo, DM	11	leg	strepto milleri, mixed anaerobes	Died
48	F	39.5	62.5	nil	8	Leg	Strepto	Recovered

Table 2

LRINEC SCORE – (Laboratory risk indicator for necrotising fasciitis score)

Parameters	Value	Score
C- reactive protein	<150	0
	>150	4
Leucocyte count	<15 - 25	1
	> 25	2
Haemoglobin	11.5 - 13.5	1
	< 11.5	2
Serum sodium	< 135	2
Serum creatinine	> 141	2
Serum Glucose	> 10	1

Results

The results collected for each of the 16 patients were age, gender, predisposing factors, presenting signs and symptoms, location of infection, laboratory findings, microbiological cultures, the type of therapy used, treatment outcome and number of days in the hospital. Age ranged from 30 to 77 years (average age 54.6). No children seen in this group. There were three females and thirteen males in this case series. The most common associated comorbidity was DM in 6, followed by IVDU in 3 patients. One patient developed infection post cobra bite and 5 patients did not have any significant medical background. One patient was immunosuppressed following recent chemotherapy. Regarding the site of infection, 11 cases of NF involved the lower extremities and 5 cases involved the upper extremities. Severe local pain with swelling and erythema were seen in all patients. Crepitus in 8 cases and Fever in all cases were observed on admission.

Leucocytosis was observed in 8 cases.

Group statistics revealed the age is an important factor for predicting high mortality.

Table 3

Outcome		N	Mean	Std. deviation	Std. error mean
Age	Mortality	4	70.75	7.089	3.544
	Recovered	12	49.25	12.941	3.736
WCC	Mortality	4	9.200	9.01369	4.50685
	Recovered	12	23.0583	16.23859	4.68768
LRINEC	Mortality	4	9.75	1.89297	0.94648
	Recovered	12	9.500	1.78377	0.51493

In all cases, the urgent gram staining was done and intraoperative samples were sent for microbiology.

In our case series, we noted streptococci is the commonest pathogen found in 9 cases, staphylococcus was seen in 4 cases, 2 cases had serretia marcescens and mixed anaerobes noted in 1 case. All the infections were treated in line with the Hospital's antimicrobial policy and advice. The LRINEC score P value was 0.098 for mortality group and 0.099 for morbidity group, noted to be significant. Hence LRINEC score is useful in diagnosis of Necrotising Fascitis.

Discussion

In this study we noted that streptococci and staphylococci remain the virulent and commonest organisms as discussed in the literature [4,5].

This condition is common in males, diabetes mellitus being the most common co morbid condition. A very high index of suspicion is needed for the early clinical diagnosis due to lack of clear clinical signs [6].

We also noted that LRINEC score is an important to predict the morbidity and mortality as the mean score was 9.5 (range 6-12). We noted 4 deaths in our case series, 3 of 4 patients had DM and streptococci as a main pathogen. The mean LRINEC score in these 4 cases was 10.2 (range 7 to 12). Hence, we concluded DM and streptococcal infection has highest mortality.

The rapid deterioration of the clinical signs and symptoms in Necrotising fasciitis differentiate this condition from diabetic foot.

In conclusion, Necrotizing fasciitis is life/limb threatening condition that results in gross morbidity and mortality if not treated in its early stages [7].

It is a surgical emergency and carries a high morbidity and mortality rate. We strongly recommend the high clinical suspicion, prompt investigations and resuscitation with appropriate antimicrobial therapy followed by expedited surgical debridement to reduce the morbidity and mortality [8,9].

Conclusion

Necrotizing fasciitis is a rare but potentially fatal disease. It is a surgical emergency with a high morbidity and mortality rate. This condition is more common in males, diabetes mellitus being the most common co morbid disease. A high index of suspicion is called for early diagnosis of this condition due to the paucity of specific skin findings. We strongly recommend the high clinical suspicion and LRINEC score can be used to diagnosis these cases and prompt surgical debridement without delay is the key to the treatment. We also noted that age is an important mortality predictor, hence the older patients should have judicious and escalated management plan in place to reduce the mortality.

References:

1.Bellapianta JM, Ljungguist K, Tobin E, Uhl R. Necrotising Fascitis. J Am Acad Orthop Surg 2009 Mar; 17(3): 174-82

2.Edlich RF, Winters KL, Woodard CR, Britt LD, Long WB 3rd. Massive soft tissue infections: necrotising fasciitis and purpura fulminans. J Long Term Eff Med Implants. 2005;15(1):57-65.

3.Elliott D, Kufera JA, Myers RA. The microbiology of Necrotizing soft tissue infections. Am J Surg. 2000; 179; 61-6.

4.Fontes RA Jr, Oglivie CM, Miclau T. Necrotising soft tissue infections. J Am Acad Orthop Surg 2000 May-Jun;8(3):151-8

5.Headley AJ. Necrotising soft tissue infection: a primary care review. Am Fam Physician. 2003 Jul 15;68(2):323-8

6.Kihiczak GG, Schwartz RA, Kapila R. Necrotising fasciitis: a deadly infection. J Eur Acad Dermatol Venereol 2006 Apr; 20(4):365-9

7.Lancerotto L, Tocco I, Salmoso, R, Vindigni V, Bassetto F. Necrotising Fascitis. Classification, Diagnosis and Management. J Trauma Acute Care Surg. 2012. Mar; 72:560-6

8.Puvanendran R, Huey JC, PasupathyS. Necrotizing fasciitis. Can FAM Physician. 2009 Oct;55(10):981-7.

9.Wilson B. Necrotising fasciitis. Am Surg. 1952;18(4):416–31.