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ORIGINAL ARTICLE

Evaluation of cases of necrotizing soft tissue infections

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ABSTRACT:

Background: A range of disease entities known as necrotizing soft tissue infections (NSTIs) are distinguished by widespread, quickly spreading soft tissue necrosis, which often affects the fascia and subcutaneous tissue but can also impact the skin and muscles. The present study was conducted to evaluate cases of necrotizing soft tissue infections. **Materials & Methods:** 50 patients of necrotizing soft tissue infections of both genders were selected and depending on the severity of the disease, all patients received aggressive resuscitation, surgical debridement with re-exploration if necessary. **Results:** Out of 50 patients, 28 were males and 22 were females. The site of infection was perineum in 6 and 3, trunk in 5 and 1, upper limb in 5 and 2 and lower limb in 18 and 10 in survivors and non- survivors respectively. Laboratory variables showed anaemia in 19 and 8, leukocytosis in 11 and 9, raised creatinine in 9 and 3, hyponatremia in 7 and 5, raised LFT in 12 and 7. Physiologic variablesshowed systolic blood pressure (>120/80) (mm of Hg) in 4 and 2, pulse rate >110 in 3 and 6, temperature >100°F in 9 and 7 in survivors and non- survivors respectively. The difference was significant (P< 0.05). Comorbidities among survivors and non- survivors were diabetes mellitus in 5 and 4, COPD in 3 and 2, PVD in 2 and 4 and hypertension in 4and 3 patients respectively. The difference was significant (P< 0.05). **Conclusion:** These findings suggest that early detection and treatment of NSTI may enhance the prognosis of this dangerous condition. NSTIs continue to have a high mortality and morbidity rate even with the use of adequate antibiotic therapy, rigorous debridement, and rapid resuscitation. A worse outcome was linked to elevated creatinine, and a delay in the first debridement.

Keywords: diabetes mellitus, necrotizing soft tissue infections, surgical debridement

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INTRODUCTION

A range of disease entities known as necrotizing soft tissue infections (NSTIs)are distinguished by widespread, quickly spreading soft tissue necrosis, which often affects the fascia and subcutaneous tissue but can also impact the skin and muscles.[1] Around 500 BC, Hippocrates wrote the earliest description of it.[2] Since 1871 and since 1924, necrotizing fasciitis has been documented in medical texts and surgical literature, respectively.[3] Mortality rises with the depth of the initial site of infection and is directly correlated with the timing of intervention. Mortality varies from 73% to 8.7%. The fatality rate from streptococcal toxic shock syndrome might reach 80%.[4]

Increasing age, diabetes mellitus, peripheral vascular disease, obesity, chronic renal failure, HIV, alcoholism, intravenous drug abuse, abscess, blunt or penetrating trauma, insect bite, surgical incision, and postponing surgical debridement are some of the individual factors that have been linked to an increased mortality rate from NSTI.[5] Unfortunately, it has not been possible to definitively identify risk factors for mortality due to the limited number of patients reported in the majority of NSTI series.[6]In 25% to 50% of patients, no clear inciting incident has been found despite the abundance of risk indicators. The therapy of patients in the Surgery Section depends on early diagnosis, a regimen of aggressive debridement with re-exploration, nutritional assistance, broad spectrum antibiotics, and robust resuscitation.[7]The present study was conducted to evaluate cases of necrotizing soft tissue infections.

MATERIALS & METHODS

The study was carried out on50 patients of necrotizing soft tissue infections of both genders. All gave their written consent to participate in the study.

Data such as name, age, gender etc. was recorded.NSTIs that happened after a recent surgical incision were referred to as post-operative NSTIs. WBC count > 10,000c/cu.mm was considered leucocytosis; Hb < 10g/dl was considered anemia; and sodium < 134 mg/dl was considered hyponatrenia. Depending on the severity of the disease, all patients received aggressive resuscitation, surgical debridement with re-exploration if necessary, intravenous antibiotics such as carbapenems or cephalosporins, along with metronidazole and clindamycin, the dosage of which was modified based on the patient's renal function, nutritional support, and early soft tissue coverage. Later, the antibiotics were switched based on the sensitivity and culture reports.Results thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Total- 50		
Gender	**Male**	**Female**
Number	28	22

Table I shows that out of 50 patients, 28 were males and 22 were females.

Table II Assessment of parameters

Parameters	Variables	Survivors (34)	Non- survivors (16)	P value
Site of infection	Perineum	6	3	0.57
	Trunk	5	1	
	Upper limb	5	2	
	Lower limb	18	10	
Laboratory variables	Anaemia	19	8	0.04
	Leukocytosis	11	9	
	Raised creatinine	9	3	
	Hyponatremia	7	5	
	Raised LFT	12	7	
Physiologic variables	SBP(>120/80)	4	2	0.05
	Pulse rate >110	3	6	
	Temperature >100°F	9	7	

Table II, graph I shows that site of infection was perineum in 6 and 3, trunk in 5 and 1, upper limb in 5 and 2 and lower limb in 18 and 10 in survivors and non- survivors respectively. Laboratory variables showed anaemia in 19 and 8, leukocytosis in 11 and 9, raised creatinine in 9 and 3, hyponatremia in 7 and 5, raised LFT in 12 and 7. Physiologic variables showed systolic blood pressure (>120/80) (mm of Hg)in 4 and 2, pulse rate >110 in 3 and 6, temperature >100°Fin 9 and 7in survivors and non- survivors respectively. The difference was significant (P< 0.05).

Graph I Assessment of parameters

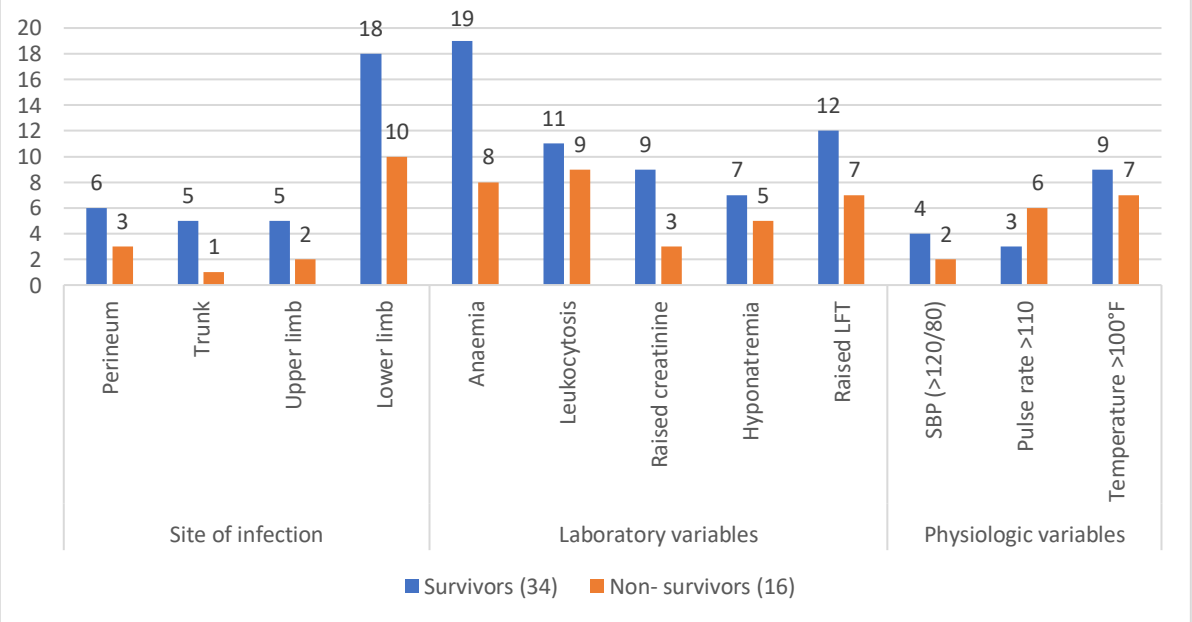

Table III Comorbidities

Comorbidities	Survivors (34)	Non- survivors (16)	P value
Diabetes mellitus	5	4	0.05
COPD	3	2	
PVD	2	4	
Hypertension	4	3	

Table III shows that comorbidities among survivors and non- survivors were diabetes mellitus in 5 and 4, COPD in 3 and 2, PVD in 2 and 4 and hypertension in 4 and 3 patients respectively. The difference was significant (P< 0.05).

DISCUSSION

Pain, anxiety, and diaphoresis are classic signs of NSTI that get worse quickly. In the 48 hours before symptoms appear, there may have been a history of trauma or a rupture in the skin's continuity, and there will be soreness that goes beyond redness, which is extremely typical. However, only 10–40% of patients have a traditional background when they first arrive.[8,9] Although discomfort is typically out of proportion to physical findings, some patients may have little to no pain.[10] The most typical symptoms of an NSTI are localized erythema and edema.

Only when equivalent skin ischemia takes place—typically later in the course of the disease—will skin alterations become noticeable.[11,12]The present study was conducted to evaluate cases of necrotizing soft tissue infections.

We found that out of 50 patients, 28 were males and 22 were females.Kalaivani V[13]assessed the factors contributing to mortality due to NSTI. Methods: A retrospective review of the records of all patients with NSTI involving fascia, skin or muscle. Sixty patients records were reviewed. Fifty-one patients (85%) were males and nine (15%) were females. Mean age was 46.57 years (+/- 20.60) ranging from 15–83 years. All the patients were treated by debridement & wide spectrum antibiotics. Mono-microbial aetiology being found in 27 patients (63.3%) and polymicrobial culture was isolated in 13 patients (36.7%), with E-coli and staphylococci being the most common organisms to be isolated. In most patients, multiple debridement was done. The overall mortality rate was estimated to be 25%. Age, aetiology, diabetes mellitus, hypoalbuminemia, alcohol, site of infection, bacteriology etc. were the risk factors associated with mortality, that were evaluated. Diabetes mellitus was the most common associated risk factor found in 32 patients (53.3%), though not statistically significant. Increasing age, raised serum creatinine (>1.2mg/dl, p-value = 0.023) and delayed surgical intervention(>24 hours p value= 0.006) were the risk factors associated with Mortality in NSTI that were statistically significant.

We found that site of infection was perineum in 6 and 3, trunk in 5 and 1, upper limb in 5 and 2 and lower limb in 18 and 10 in survivors and non- survivors respectively. Laboratory variables showed anaemia in 19 and 8, leukocytosis in 11 and 9, raised creatinine in 9 and 3, hyponatremia in 7 and 5, raised LFT in 12 and 7. Physiologic variablesshowedsystolic blood pressure (>120/80) (mm of Hg) in 4 and 2, pulse rate >110 in 3 and 6, temperature >100°F in 9 and 7 in survivors and non- survivors respectively. Espandar R et al[14]studied twenty-four histopathologically proven necrotizing fasciitis patients to assess the prognostic factors that indicate the outcome. Mortality rate was 20.8%. Twelve patients (50%) improved, while seven patients (29.2%) were complicated by limb loss. Mortality rates related to upper and lower limb involvement were similar (20% vs. 22.2%). The rates of gangrene and amputation in patients with diabetes mellitus were significantly higher than other comorbidities. Patients with gram-positive infections had significantly lower rates of amputation (15.4% vs. 54.5%, $P = 0.04$). Mean band cell count and serum potassium level were significantly higher in the nonsurvivors same as leukocyte count in the patients with gangrene, while serum sodium level was significantly lower in nonsurvivors.

We found that comorbidities among survivors and non- survivors were diabetes mellitus in 5 and 4, COPD in 3 and 2, PVD in 2 and 4 and hypertension in 4 and 3 patients respectively. Fazeli S et al[15]evaluated prevalence of variables including predisposing factors, clinical and paraclinical findings, distribution of tissue involvement and mortality rate in 102 patients of necrotizing fasciitis. Prevalence of this disease was higher in males than females with the rate of 2.6:1. Diabetes mellitus was the most common predisposing disease. Genital region was the most common site of involvement. Muscles were involved in 25.5% of cases. Nonspecific erythema was the main dermatological manifestation. The most common organism was Enterococcus faecalis and mortality rate was 10.8%.

The shortcoming of the study is small sample size.

CONCLUSION

Authors found that early detection and treatment of NSTI may enhance the prognosis of this dangerous condition. NSTIs continue to have a high mortality and morbidity rate even with the use of adequate antibiotic therapy, rigorous debridement, and rapid resuscitation. A worse outcome was linked to elevated creatinine, and a delay in the first debridement.

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