

Clinical Profile and Outcome of Necrotizing Fasciitis

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ABSTRACT

Background: Necrotizing fasciitis is soft tissue infection which spreads through the fascial planes. It is a surgical emergency with its rapid onset and varied occult characteristic can cause diagnostic delays resulting in high mortality and morbidity. **Objectives:** To study the clinical profile and evaluate the determinants of outcome in patients with necrotizing fasciitis. **Methods:** A descriptive study of patients admitted and operated in the surgical units of Nepalgunj Medical College and Teaching Hospital Kohalpur with a diagnosis of necrotizing fasciitis from January 2013 to December 2015. **Results:** Total of 45 patients were included in the study. There were 27(60%) male and 18(40%) female, male to female ratio being 1.5: 1. The patient's age ranged from 2 to 76 years with mean age being 48.04±19.62 years. 38(84.44%) patients had no predisposing factor however trauma was the triggering factor in 4(8.89%) cases followed by surgery and insect bite. Diabetes mellitus 26(57.78%) and alcohol dependence 5(11.11%) cases were the most common co morbid condition associated with the disease. The lower limb 28(62.22%) was the most common site followed by upper limb, scrotum, perineum, trunk and abdomen. The growth was polymicrobial in 24(53.33%), mono microbial in 16(35.56%) and sterile in 5(11.11) cases. Staphylococcus aureus was predominant in 24(53.33%) cases followed by Streptococcus, E coli, Klebsiella, Enterococcus. The main procedure was debridement with secondary suturing 23(51.11%) and debridement with grafting in 18(40%) patient. Amputation was done in 2(4.44%) and secondary wound healing was observed in 2(4.44%) patients. 39(86.67%) cases improved with the above management while mortality was observed in 3(6.67%). 3(6.67%) cases left against medical advice so outcome was unknown **Conclusion:** On the basis of our study we concluded that high index of suspicion and awareness of the clinical presentation is required to diagnose this condition early. Diabetes mellitus is the most common co-morbid condition associated with necrotizing fasciitis. The presence of multiple co morbid conditions and delayed presentation reduces the survival rate. Early diagnosis and debridement, broad spectrum antibiotics with organ supportive intensive care will improve morbidity and mortality.

Key words: Diabetes mellitus, debridement, necrotizing fasciitis

INTRODUCTION

Necrotizing fasciitis is fatal life threatening soft tissue infection which is progressive and spreads rapidly through the fascial planes. It is a surgical emergency with increased mortality rate. The varied clinical presentation includes pain out of proportion to the physical finding, haemorrhagic bullae, edema, subcutaneous bleeding, ulcer and gangrene. Presence of systemic manifestation like hypotension, fever, tachycardia, tachypnea and mental disturbances further adds to the morbidity and mortality. Mortality rate has not changed significantly for several decades, and still remains high, ranging from 24-34%¹.

The term necrotizing fasciitis was coined by Wilson² in 1952 and referred it to as any infection of the soft tissue that is associated with necrosis requiring operative intervention. The purpose of the present study was to evaluate the common clinical presentation and the factors determining the mortality and morbidity of this disease in this part of Nepal.

MATERIALS AND METHOD

A descriptive study was conducted at the surgical units of Nepalgunj Medical College and teaching hospital Kohalpur from January 2013 to December 2015. All patients presenting with necrotizing fasciitis were included in the study. Clinical history and detailed examination, co morbidity, predisposing factor, duration of symptoms, site of involvement was noted. Biochemical parameters like white blood cell count, hemoglobin, renal parameters, serum levels of sodium, albumin and sugar at the time of admission was recorded. The presence of grayish necrotic fascia, demonstration of a lack of resistance of normally adherent muscular fascia to blunt dissection, lack of bleeding of the fascia during dissection, the presence of foul-smelling "dish-water" pus with obliterative thrombosis of arteries and veins were used for the diagnosis of the disease.

Patients were managed initially with broad spectrum antibiotics followed by culture-based antimicrobials along with

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debridement and repeated as required till the devitalized tissues were completely removed. Daily dressings followed by either secondary suturing or grafting of the wound were done. The time from admission to operative treatment, type of operative intervention, the culture and sensitivity reports, the need for amputation, the duration of hospitalization and mortality rate were recorded

RESULTS

Total of 45 patients were included in the study. There were 27(60%) male and 18(40%) female, male to female ratio being 1.5: 1. The patient's age ranged from 2 to 76 years with mean age being 48.04±19.62 years. The highest number of patients, 13(28.89%) were in the age group of 51 to 60 years as shown in table I.

Age in years	Number(n=45)	Percentage
1-10	3	6.67
11-20	3	6.67
21-30	3	6.67
31-40	2	4.44
41-50	8	17.78
51-60	13	28.89
61-70	11	24.44
71-80	2	4.44

Table I: Age distribution

Out of 45 patients, 38(84.44%) had no predisposing factor. Among the predisposing factor trauma was the most common cause in 4(8.89%). Other factors being surgery and insect bite as shown in table II.

Predisposing factor	Number(n=45)	Percentage
Idiopathic	38	84.44
Trauma	4	8.89
Surgery	2	4.44
Insect bite	1	2.22

Table II: Predisposing factor with frequency

The associated co morbidities as shown in table III revealed that diabetes mellitus was the most common which was found to be in 26(57.78%) patients followed by alcohol dependance in 5(11.11%) cases. However no co morbidities were found in 7(15.56%) cases. The lower limb 28(62.22%) was the most common site followed by upper limb, scrotum, perineum, trunk and abdomen. All patients had pain, tenderness, erythema and warm skin. 19(42.22%) also had bulla formation.

Co morbidities	Number(n=45)	Percentage
Diabetes mellitus	26	57.78
Alcohol addiction	5	11.11
Anemia	2	4.44
Immunosuppressant	2	4.44
IV drug abuse	1	2.22
Liver disease	1	2.22
Renal disease	1	2.22
No comorbidities	7	15.56

Table III: Associated co morbidities with frequency

The bacteriological study revealed that growth was polymicrobial in 24(53.33%) and mono microbial in 16(35.56%) patients, however in 5(11.11%) cases it was sterile. The common growth of organism found was Staphylococcus aureus in 24(53.33%) cases followed by Streptococcus, E coli, klebsiella, Enterococcus. Pseudomonas was isolated in a single case. Staphylococcus aureus was the most predominant organism found in polymicrobial growth in 18(40%) cases whereas Group A Beta hemolytic streptococci was predominant organism in monomicrobial growth in 12(26.67%) cases.

Out of 45 patients, 23(51.11%) patients underwent debridement with secondary suturing and debridement with grafting was done in 18(40%) patients. Amputation was done in 2(4.44%) patients to control the rapidly progressing infection. Secondary wound healing was observed in 2(4.44%) patients.

The aggressive and early intervention led to the improvement in 39(86.67%) cases. Mortality was observed in 3(6.67%) cases out of which two had uncontrolled diabetes mellitus and one patient had renal disease. The cause of death was sepsis and multi organ failure in these cases. Outcome in 3(6.67%) patients were unknown as they left against medical advices.

DISCUSSION

Necrotizing fasciitis is progressive fulminant bacterial infection of subcutaneous fat which spreads rapidly through the fascial plane causing extensive tissue damage. It is a surgical emergency and has a cumulative rate of mortality of 34%(6-76%)³. Similar finding of mortality of 21.9% was noted by Anogoue et al⁴ in his systemic review of necrotizing fasciitis. The difficulty of making early diagnosis and lack of cutaneous manifestation delays the surgical intervention leading to increased morbidity and mortality.

The majority of patients presented with pain which was out of proportion to apparent physical finding. Tenderness, erythematous and warm skin was present in all cases which is similar to the clinical profile described by Hasham et al⁵ and Hassell et al⁶ in their studies. Clinically pain precedes skin changes by 24-48 hours and apparently normal looking skin is

seen during the early pathological stages despite extensive infection underlying the fascia. An intermediate stage characterized by the formation of small bullae was noted as the disease progressed. Large haemorrhagic bullae, skin ulceration crepitation and motor and sensory deficits were late signs; often called as the “hard sign” of disease⁷.

Patients with necrotizing fasciitis may have some initiating factor such as trauma, surgery, scratch or bites⁸. However in our study 84.44%(38) patients had no predisposing cause while in remaining cases trauma 8.89%(4), surgery 4.44%(2) and insect bite in 2.22%(1) was found as an initiating factor which is in accordance with study done by Garg et al⁹.

Wong et al.¹⁰ in 2003 found that diabetes mellitus(71%) was the most common co morbidity followed by alcoholism(10.4%) which was similar to our study in which 26(57.78%) and 5(11.11%) had diabetes mellitus and alcoholism respectively. Out of 45 cases; 7(15.56%) had no associated disease. Anemia, chronic renal disease and use of immunosuppressant were other factor.

In our study, the lower limb was most commonly affected site in 62.22% (28) cases followed by upper limb 13.33% (6), scrotum 8.89%(4) perineum 6.67% (3) trunk 6.67% (3) and abdomen 2.22%(1). Similar findings were noted by Frazee et al¹¹ in 2008 and Nisbet et al¹² in 2012 where the involvement of extremities was seen in 73.7% and 70% respectively

The pattern of growth in our study was of polymicrobial 53.33% (24) followed by monomicrobial in 35.56% (16). 11.11% (5) of cases did not show growth. The common organisms found were *Staphylococcus aureus* in 53.33% (24) cases followed by *Streptococcus*, *E coli*, *Klebsiella*, *Enterococcus*. *Pseudomonas* was isolated only in a single case. *Staphylococcus aureus* was the most predominant organism found in polymicrobial growth in 40% (18) cases whereas Group A Beta hemolytic *Streptococci* was common in monomicrobial growth in 26.67% (12) cases. Similar profile of growth of organism was found by Elliot et al.¹³ and Brook et al.¹⁴ in their studies respectively.

In present study 51.11% (23) patient underwent debridement with secondary suturing and debridement with grafting in 40% (18) patient. Amputation was done in 4.44%(2) patient to control the rapidly progressing infection. Secondary healing of wound was observed in 4.44%(2) patients. Similar was the outcome in the study conducted by Madhumita et al.¹⁵ in 2011 where 48% of the patients underwent debridement with secondary suturing while 42% of the patients required skin grafting.

Our preference for the aggressive and early intervention led to the improvement in 86.67% (39) cases. Mortality was observed in 6.67% (3) cases out of which two had uncontrolled diabetes mellitus and one patient had renal disease. The cause of death was sepsis and multi organ failure in those cases. Outcome in

6.67%(3) patients were unknown as they left against medical advices. The mortality rate in studies conducted by Wong et al.¹⁰ and Elliot et al.¹³ was similar to our study.

CONCLUSION

Necrotizing infection remains one of the most devastating soft tissue polymicrobial infections in surgical practice. It is more common in middle aged group with diabetes mellitus being the most common morbidity associated with it. A high index of suspicion should be made if there is rapidly progressing swollen tender erythematous lesion with bulla and crepitation. Early surgical debridement under broad antibiotic coverage with dressing is the cornerstone of therapy. The presence of multiple comorbidity and delay in the diagnosis and intervention increases the morbidity and mortality.

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