

THE OUTCOMES OF NECROTIZING SOFT TISSUE INFECTIONS WESTERN UTTAR-PRADESH: A PROSPECTIVE STUDY

¹Dr. Palash Agrawal,²Dr. Arvind Kumar Maurya, ³Dr. Akhil Kumar Gupta

¹Junior resident, Department of General Surgery, Muzaffarnagar Medical College, Muzaffarnagar, Uttar Pradesh, India

²Associate Professor, Department of General Surgery, Muzaffarnagar Medical College, Muzaffarnagar, Uttar Pradesh, India

³Professor & HOD, Department General of Surgery, Muzaffarnagar, Medical College, Muzaffarnagar, Uttar Pradesh, India

Corresponding Author: Dr. Arvind Kumar Maurya (akmaurya54@gmail.com)

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Abstract

Aim:The outcome of necrotizing soft tissue infection in Western UttarPradesh-A Prospective Study.

Material and Methods: This study was conducted at Muzaffarnagar medical college Muzaffarnagar UP from Sept 2019to Sept 2021.50 patients with clinical features of Necrotic soft tissue infection were admitted and twice daily dressing and debridement with broad spectrum antibiotics.

Results: 58 patients with features of necrotic soft tissue infection were admitted during study period showed Lower Limb Involvement (57%) followed by perianal region an scrotum(23%). Diabetes (74%) was the most common co morbidity found and was associated with increased risk of mortality, which previous studies also confirmed. In this study mean duration of admission was 24.9days.10patients died during treatment due to severe sepsis. In this study rta is the 3rd common cause of nsti during this study period(8.9%).with 40% patients healed with no need for grafting(lund and browders chart of burn).

Conclusion: 40-60 years aged were most commonly involved. As the duration of stay increases the mortality tends to increase early debridement with twice daily dressing with antibiotic coverage determine the outcome of the patients with necrotic soft tissue infections.

Keywords:XXXXXXXXXXXXXXXXXXXXXXXXXXXX

Introduction

Necrotizing Fasciitis is defined as Synergistic spreading infection of facial planes. Necrotizing Fasciitis (NSTI), also known as necrotizing soft tissue infections that results in the death of parts of soft tissues^[1]. It is a severe disease of sudden onset that spreads rapidly^[1]. Symptoms usually include dusky(ashy) skin in the affected area, severe pain, fever, and features of shock^[1].Affected areas include Submandibular and sub lingual spaces (Ludwig's Angina),Thoracic and abdominal wall(Meleney's Synergistic gangrene),lower abdomen and perineum(Fournier's Gangrene). Lower limb and Perineum are common ^[2].

The worldwide incidence is at 0.4 per 100,000^[4].Mortality is up to 80% without intervention and 30-50% with intervention. Delay in intervention is associated with poor outcome. The risk factors for NSTI are diabetes mellitus illicit drug use (steroids, chemotherapeutic agent), malnutrition, prolonged bed rest and HCV and HIV are rest among others. Prevalence isreported higher in the extremes of age. Most studies carried out have looked at few patients spread over several years^[3,4]. Poor economic conditions, delays in referral, long distance to tertiary hospital were found to be the main problems patients had to face ^[5].

Aim: To describe the early outcome and management protocol of necrotizing fasciitis amongst patients at Muzaffarnagar Medical College Muzaffarnagar UP INDIA. Patients with necrotizing fasciitis were admitted after informed written consent and aggressive debridement with broad spectrum antibiotic coverage was given.

Material & Methods: A prospective case series study conducted at MUZAFFARNAGAR MEDICAL COLLEGE AND HOSPITAL from Sept 2019 to Sept 2021 for period of 2 years including all cases coming to Emergency and Surgery Opd. A total of 58 with features of NSTI were consecutively admitted after clinical evaluation, laboratory and microbiological tests were performed. Twice daily dressing with hydrogen Peroxide and 10% Betadine along with aggressive debridement was under broad-spectrum antibiotics intravenously.

Study design

This was a prospective case series study

Study place

The study was carried out at MUZAFFARNAGAR MEDICAL COLLEGE AND HOSPITAL MUZAFFARNAGAR UTTAR-PRADESH, from Sept 2019 to Sept 2021 for a period of 2 years.

Inclusion criteria

1. During this study all the patients coming to emergency and Opd During 2019-2021.
2. Spreading Infections, Loss of sensation.
3. Post-Surgical Patients having dusky discoloration, pain, discharge from suture site/operative wound.

Exclusion criteria

1. Patients with NF who requested for discharge before admission were excluded.
2. Gas gangrene (also known as clostridialmyonecrosis and myonecrosis) is a bacterial infection that produces tissue gas in gangrene. This gangrene usually is caused by *Clostridium perfringens* bacteria. Immunocompromised condition such as HIV, Chemotherapy.
3. Abscess (An abscess is a painful collection of pus, usually caused by a bacterial infection).

Investigations: Blood for the following investigations was drawn from each patients and is sent for haemoglobin, TLC, DLC, platelet count, random blood sugar, blood urea, serum creatinine, PT-INR/BT-CT.

Microbiology: Pus culture was taken from site of discharge is transported via sterile dispo to the microbiology laboratory immediately in both aerobic and anaerobic conditions for gram staining, and culture and sensitivity tests.

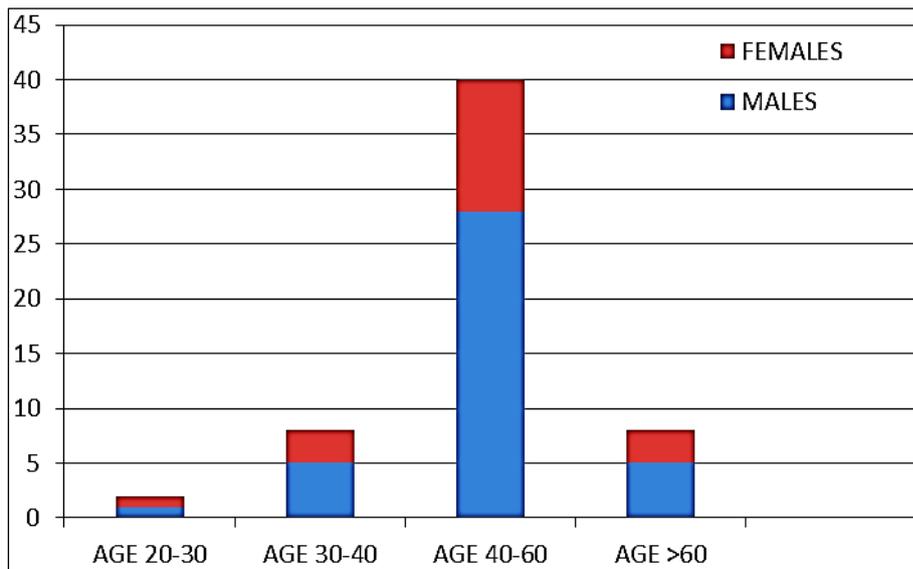
Tissue biopsies were taken margin of the apparently of skin and the affected site by making a deep incision (2 cm) up to and including the deep fascia. Noting the ease with which this layer separates from the underlying layers and the lack of bleeding at the incision site. Aseptic technique was used. Tissue biopsy specimens were transported in sterile containers with formalin to the histopathology laboratory for hematoxylin-eosin staining.

S. No.	Prevalence Of gram positive cocci according to our hospital record (37/58)	Prevalence of gram negative bacilli according to our hospital record (21/58)
1	Staphylococcus pyogenes (42%)	Pseudomonas (35%)
2	Staphylococcus Aureus (34%)	E.coli (27%)
3		Klebsiella (20%)
4	Other Gram+ (1%)	Proteus (1%)

*due to different sampling techniques there is low incidence of gram Negative microorganism

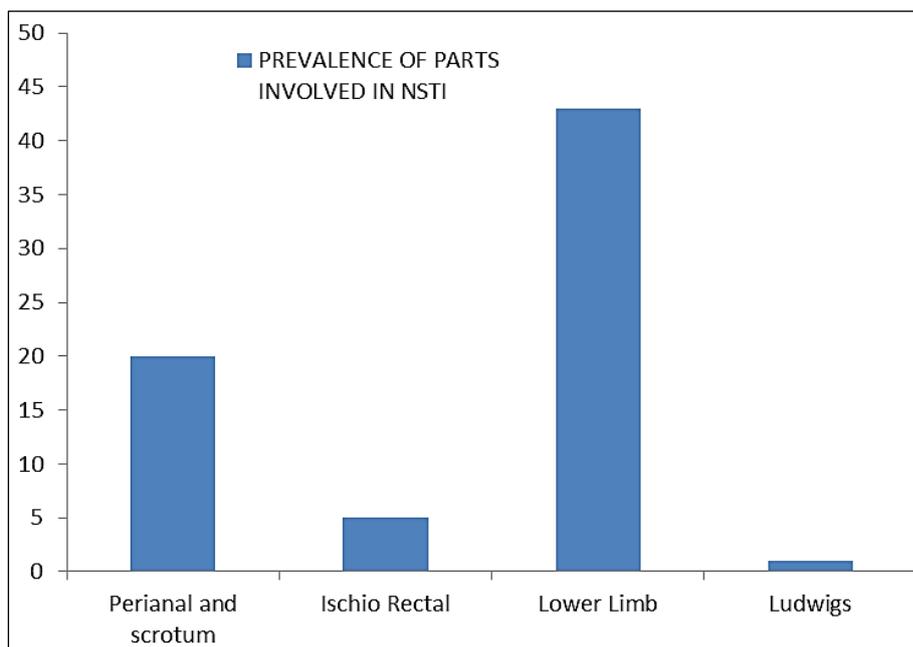
Gram positive organisms included enterococcus faecalis, corynebacteria species, and staphylococcus aureus. Gram negative organisms included escherichia coli (E.coli), klebsiella pneumonia, proteus mirabilis, providentia Stuartii, pseudomonas aeruginosa, Mycobacterium species, providenciairetteri, klebsiella oxytoca and acinetobacterbaumannii.

Results: Fifty Eight patients were recruited over a period of 2 year. More males were affected in the ratio of 3:1. The 40-70 years age group was most affected median age 52years (25-72). Attainment of healthy granulation tissue took 23 days on average. Mortality rate was 14% (8/58). Co-morbidities included HCV 10/58 (17%), DM(38/58) with No co morbidities 17/58.(9.8%) The commonest organisms were gram positive cocci (Staphylococcus pyogenes(42%) followed by Gram Negative bacilli (Pseudomonas (35%) and E.coli (20%). Split skin grafting was necessary in 42% (24/58) of patients and in 4 (2.3%) patient Amputation was done. The female: male ratio was 1:3 (Graph 1).



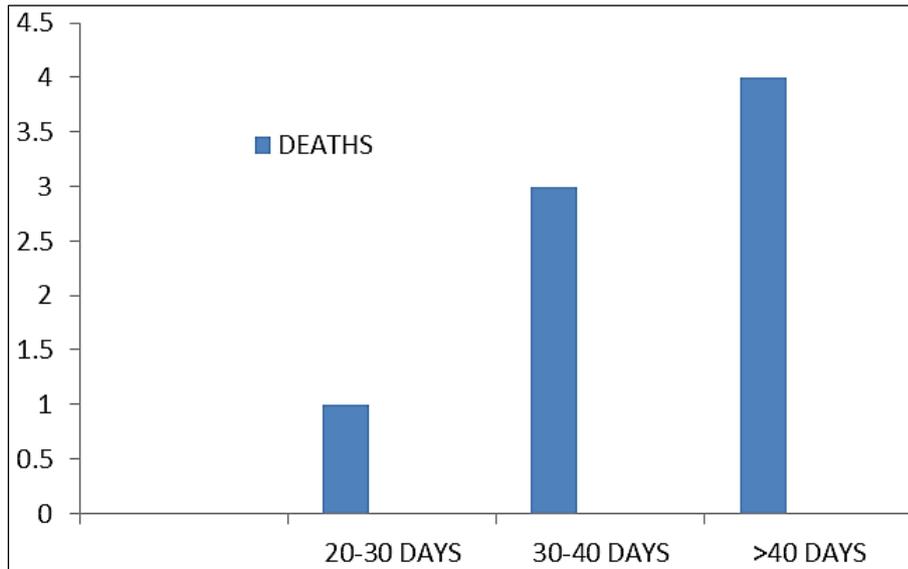
Graph 1: Relation between male and females of different age groups

Risk factors of necrotizing fasciitis: The risk factors of NSTI included Diabetes, alcohol intake, Debilitating injuries (road traffic accidents), severe comorbidities (bed ridden). In this study lower limb were the most affected body parts 33/58 (57%) followed by Scrotum and Perineum 23% (13/58) trauma cases associated with NSTI 4.6% (8/58) as shown in graph 2.



Graph 2: Prevalence of parts involved in NSTI

Outcomes of necrotizing fasciitis: There was generally a good outcome of patients with NSTI (86%). There were 10 deaths (5.8%), 7 males and 3 Females out of which 7 (70%) were diabetic as well as hypertensive. The dead were between age 42 to 65 years old. HCV positive were 13/58, (70%) diabetic 38/58, and these presented to hospital on average after 12 days of onset of the infection and died on average 21 days after onset of illness, and 2 (1.16%) patients had a fulminant course of the illness and died within few days of the diagnosis of necrotizing fasciitis following a debridement. The cause of death was septicemia shock in these patients (graph 3).



Graph 3: Outcomes of necrotizing fasciitis

Wound care: The need for wound coverage after attainment of healthy granulation tissue was necessary for 42/58 patients (74%). The 21/58 patients who did not require wound closure or coverage had a surface area of wound of less than 1% using the Lund-Browder chart. Patients with a surface area of the wound of more than 8% required wound closure or coverage

Discussion

We set out to describe necrotic soft tissue infections as it presents at Muzaffarnagar Medical College and Hospital Muzaffarnagar UP. A large number of NSTI was seen relative to the study duration. Previous studies done had more men with NSTI than females^[6], though some others showed no gender predilection, the actual age of incidence remains unknown. None of Neonates and the elderly alike were affected by the disease in this study^[7]. The extremes of ages are probably affected by virtue of their comparably low immunity and other comorbid conditions (mean age 52yrs).

The commonest inciting event was infection representing 57% of all cases (lower Limb necrotizing soft tissue infection) 23% Cases presents with involvement of Perineum and Scrotum.

The other inciting event in this study was trauma (8.9%) which included road traffic crashes, trauma by nails, blunt implements, pressure sores from PoP cast and post-surgery (<1%). Various studies reported trauma among the inciting events^[8]. In Rea's series^[9] trauma was the leading inciting event.

Other, predisposing risk factors included Diabetes (74%), alcohol abuse (21%), HCV (10%), Rta (8.9%). Earlier studies found the slight different risk factors common ^[10,11]. Other risk factors mentioned included vascular disease, obesity, and old age. The HCV prevalence in the WESTERN UP's general population is 2.5%.

Delayed diagnosis and intervention leads to extensive tissue destruction which leads to prolonged hospital stay and increased mortality ^[19]. In this study, the average hospital stay was 24.9 days(mean).

The mean duration for formation of healthy granulation tissue was 23.4 days, which shows that average days of admission. As the no of days of the hospitalization increases the mortality rate due to the disease increase due to sepsis.

Conclusion

58 patients with NSTI were admitted. 12(6.9%) patient were associated with high mortality with hospital stay (mean) 24.9 days. Cases with low morbidity with stay of average 20 days. There was a high preponderance of males to females (3:1), lower limbs(57%) were the more affected body part along with perineum(23%) (Poor hygienic condition). Microbiological studies proved that Staphylococcus pyogenes was most common Gram Positiveaerobes along with Pseudomonas followed by Gram Negative bacilliE.coli is most common was prevalent in our study.

During study 10 patients died due to severe sepsis. With the increase in immunosuppressive conditions (such as diabetes mellitus, cancer, alcoholism), necrotizing fasciitis has been seen to increase mortality. Local trauma to the affected site has been found commonly as a portal of entry for bacteria that initiate the infectious process¹ and is associated with high mortality and high morbidity with long hospital stay. There were few cases of road traffic accidents which presented with features of NSTI in emergency. Daily debridement with twice daily

dressings over Intravenous broad spectrum antibiotics after proper antibiotic sensitivity testing determines the outcome of the disease.

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