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Original Research Paper

General Surgery

CLINICAL STUDY OF PREDICTIVE FACTORS AND MANAGEMENT OF NECROTIZING FASCIITIS..

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ABSTRACT Necrotizing fasciitis or necrotizing soft-tissue infections (NSTIs) are infrequent but highly lethal infections. They can be defined as infections of any of the layers within the soft tissue compartment (dermis, subcutaneous tissue, superficial fascia, deep fascia, or muscle) that are associated with necrotizing changes. Aim of our study is to describe clinical,microbiological features, and outcomes of necrotizing fasciitis in 30 patients who were diagnosed with necrotizing fasciitis and admitted to ASRAMS, ELURU during the period of one year (1st October 2017- 30th September 2018).Early diagnosis and management with surgical debridement, antimicrobials, and supportive measures reduce morbidity and mortality. The present study deals with varied presentation, early diagnosis, and management of necrotizing fasciitis.

KEYWORDS : Necrotizing fasciitis, Microbial cultures, Debridement's

INTRODUCTION

Necrotizing fasciitis (NF) (NECK/roe/tie/zing Fash/ee/EYE/tis)

The term necrotizing fasciitis was first used by Wilson in 1952 to describe the most consistent feature of the infection, necrosis of fascia and subcutaneous tissue with relative sparing of underlying muscle**.** It is an uncommon but life threatening infection. It can affect all parts of body and the lower extremities are the most common sites of infection. The predisposing conditions are diabetes mellitus, peripheral vascular diseases, alcoholism, hypertension, renal insufficiency, cardiac failure and trauma. Prompt diagnosis and early treatment with adequate antibiotic with or without surgical intervention are vital because of high morbidity and mortality. We here in describe clinical, microbiological features, and outcomes of 30 patients diagnosed with necrotizing fasciitis during a consecutive one-year period and review the relevant literature.

Necrotizing fasciitislesions are entities frequently seen in daily surgical practice. These infections are marked by absence of clear local boundaries or palpable limits, which is responsible both for their severity and the frequent delay in recognizing their surgical nature. Necrotizing fasciitis is characterized by rapidly progressing inflammation and necrosis, ranging from necrosis of the skin to life threatening infection involving the fascia and muscle when it is called as Necrotizing myositis. most frequently caused by Streptococcus pyogenesand occasionally it can be caused by Staphylococcus aureus, E.coli, klebsiella species, Clostridium perfringens, clostridium septicum, Pseudomonas aeruginosa. There are several recognized risk factors. Patients who have compromised immunity such as patients with diabetes mellitus, cancer, peripheral vascular disease, and intravenous drug users, those who have recently undergone surgery, receiving steroids or other immunosuppressive treatments are all predisposed.

Main features of Necrotizing fasciitis are:

- Edema of the area with peaud'orange appearance
- Blistering and necrosis
- Crepitus of the tissues
- Pain out of proportion to the clinical findings
- Signs of systemic infection may be present
- It can occur anywhere in the body but extremities, perineum and abdominal area are the commonly affected parts.

AIM OF THE STUDY

- To assess factors which will help in clinching the diagnosis of Necrotizing Fasciitis.
- To identify factors responsible for morbidity and mortality

Materials and Methods

Source of the data:

This is a study of 30 cases diagnosed with Necrotizing Fasciitis admitted to ASRAM hospital Eluru from 1st October 2017 to 30th September 2018.

A) Inclusion criteria

- All patients admitted with Necrotizing Fasciitis.
- Study of factors like demographic data ,Blood Pressure on admission, smoking, cardiac disease, Peripheral vascular disease, alcoholism, diabetics,trauma.

B) Exclusion criteria

- Patients with Non-Necrotizing soft tissue infections were excluded from this study (e.g. Cellulitis, abscess)
- Immuno-suppressors, recent surgeries, cancers.

1.a)Post injection site necrotizing fasciitis left gluteal region

1 b).post debridement

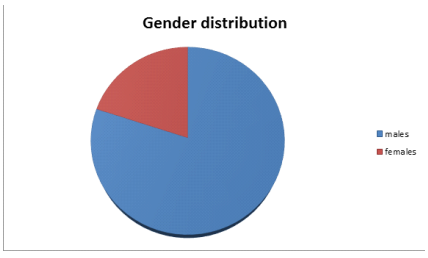
1.c).post secondary suturing

2.a)necrotizing fasciitis of left lower limb

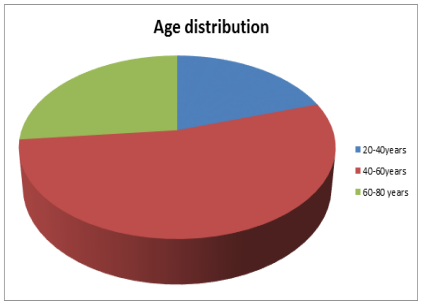
2.b) After regular debridement's and dressing

2.c) After split skin grafting

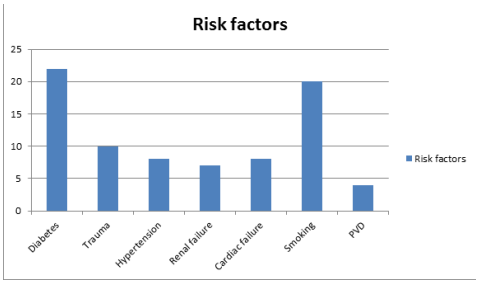
RESULTS AND OBSERVATION



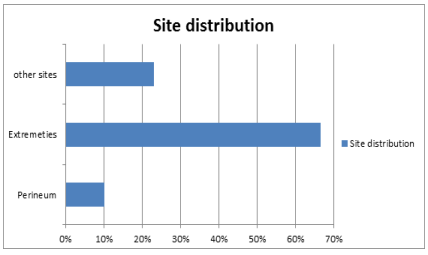
In our study out of 30 patients 24(80%) were males and 6(20%) patients were females.

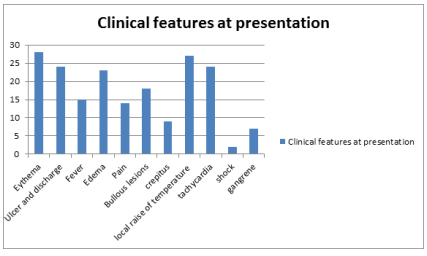


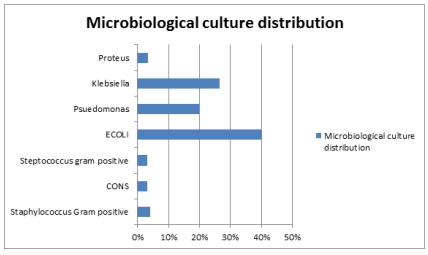
In our study 16(53.30%) patients were in between 40 to 60 years, followed by 8(26.60%) patients in between 60-80years followed by 6(20%) patients between 20-40 years.



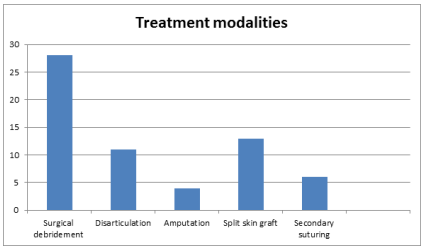
Risk factors	
Diabetes	22
Trauma	10
hypertension	8
Renal failure	7
Cardiac failure	8
smoking	20
PVD	4







	Microbiological Culture Distribution
Staphylococcus Gram positive	4%
CONS	3%
Steptococcus gram positive	3%
ECOLI	40%
Psuedomonas	20%
Klebsiella	27%
Proteus	3%



MANAGEMENT

- Aggressive fluid resuscitation.
- Early and prompt debridement in all patients.
- 4th generation cephalosporins, aminoglycosides, metronidazole.
- Multiple debridements.
- Twice daily dressings.
- General condition improvement of anaemia, hypoalbum enemia and other nutritional support.
- Skin graftings.
- Amputations.
- Proper management of MODS,ARDS,Septicemia in ICU's.

There is significant morbidity (disarticulation, amputations) which include 11(36.6%) and 4(13.3%) patients respectively but there is no mortality in our study.

DISCUSSION:

Necrotizing fasciitis is a rapidly progressive infectious disease that primarily involves the fascia and subcutaneous tissue , superficial fascia, and superficial part of the deep fascia with variable presence of cutaneous gangrene. It has been divided into distinct groups on the basis of microbiological cultures. Type 1 infections are poly-microbial infections that are usually caused by non-group Astreptococcus, other aerobic and anaerobic microorganisms. Type 2 infections are usually caused by Streptococcus pyogenes alone or with *Staphylococci*. Patients usually present with the triad of pain, swelling, and fever. Tenderness, erythema, and fever are common signs of early necrotizing fasciitis.

In our study local swelling, erythema, fever, pain/tenderness were noted in 23 patients (76%), 28 patients (93%), 15 patients (50%), 14 patients (46%),respectively. It is important to recognize the early stage, which can present with minimal cutaneous manifestations, making prompt diagnosis difficult. Pain out of proportion at the physical examination is the most consistent feature noted at the time of presentation. An apparent cellulitis that does not respond to appropriate antibiotic therapy should raise suspicion of necrotizing fasciitis especially in patients who have an underlying disease. The presence of bullae filled with serous fluid is an important diagnostic clue and should raise the suspicion of this condition. As the infection progresses, the skin characteristically becomes more erythematous, painful and swollen with indistinct borders. The skin develops a violaceous hue, may become necrotic with bullae formation and eventually appears hemorrhagic and gangrenous lesion. But large hemorrhagic bullae, skin necrosis, fluctuance, crepitus and sensory and motor deficits are late signs of necrotizing fasciitis. It is crucial to be alert to these characteristics because the earlier diagnosis of necrotizing fasciitis is made the better outcome and fewer complications will ensue. In our study, 18 patients (60%) had bullae and 9 patients (30%) were noted with crepitus.

Necrotizing fasciitis develops not only in the extremities but also in perineum and scrotum. The involvement of extemities is often secondary to trauma, illicit drug use or insect bite. Chronic renal failure patients usually have chronic edema of the lower limbs, which may predispose them to minor trauma, resulting in an entry port of bacteria.

In our study, necrotizing fasciitis in upper and lower extremities, perineum and other sites occurred in patients 20 (66%), 3 patients (10%), and 7 patients (24%) respectively.

Group-A *Streptococcus* and *S.aureus* were the predominant pathogens causing necrotizing fasciitis in the USA and Europe. However, monomicrobial Gram negative aerobic pathogens such as E. coli, Klebsiella, Pseudomonas, Proteus were the most frequently isolated microorganisms in Asia. In our study E. coli (40%) was the most common organism isolated followed by klebsiella (27%) and pseudomonas (20%) and other organisms like streptococcus, staphylococcus and proteus constitute around 13%.

Patients who have progressive necrotizing infections often deteriorate rapidly. Patients presenting with multiorgan failure are admitted to surgical intensive care unit (SICU). As soon as the diagnosis of NSTI is suspected, aggressive resuscitation and empiric broad-spectrum antibiotic coverage along with earlydebridement should be instituted. Aggressive nutritional support is mandatory in all patients after debridement. Pre and postoperative pain control is also an important part of management and should be individualized for each patient.

In our study treatment strategy after resuscitating the patient includes

- Broad spectrum antibiotics
- Surgical debridement with in 24 hours,
- Microbial cultures
- Regular dressings with eusol, Papain urease dresssing
- Topical silver.
- Topical Phenytoin.
- Negative pressure wound therapy.
- Followed by secondary suturing and split skin grafting.

No mortality was seen in our study, so early recognition of necrotizing fasciitis followed by appropriate antibiotic therapy with or without surgical intervention is necessary to reduce mortality.

Conclusion:

Our study reaffirmed that Necrotizing fasciitis is a life threatening disease with a high mortality. Early diagnosis and adequate treatment are necessary to improve the clinical outcome. Clinical awareness of necrotizing fasciitis remains pivotal. Outcome depends on the promptness of diagnosis, surgical treatment and management of post operativecomplications.

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