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# PREDISPOSING CONDITIONS OF NECROTIZING FASCIITIS – AN OBSERVATIONAL STUDY

General Surgery

**KEYWORDS:** Necrotizing fasciitis, Poly microbial, Diabetes mellitus, Hypoalbuminemia

**Vineed.S** — Assistant Professor of General Surgery, Government Medical College, Kerala, India,

**Santhoshkumar** — Assistant Professor of General Surgery, Government Medical College, Kerala, India,

## ABSTRACT

Necrotizing fasciitis is a rapidly progressive and life threatening infection of the fascia, with secondary necrosis of the skin and subcutaneous tissues. The causative organisms are commonly polymicrobial including both aerobic and anaerobic. Aim of the study was to identify the predisposing conditions. 30 cases of necrotizing fasciitis admitted in a teaching hospital in Kerala, India were prospectively studied. Of the 30 cases studied, 22 were above 50 years old. 9 were female and 21 males. In 19cases lower limb was involved, in 6 cases scrotum and perineum and in 3 cases abdomen was involved.18 cases were having diabetes mellitus and hypoalbuminemia was present in 13 case. In our study of 30cases, diabetes mellitus and hypoalbubinemia were identified as the most common predisposing factor associated with occurrence of necrotizing fasciitis.

## INTRODUCTION

Necrotizing fasciitis is a rapidly progressive and life threatening infection of the fascia, with secondary necrosis of the skin and subcutaneous tissues. Necrotizing fasciitis spreads along the facial plane.[1] First description of this sort of fast spreading soft tissue infection was by an Army surgeon, Joseph Jones, during the US Civil War in 1871.[2] Fournier documented the disease in the perineal and genital region in 1883. Meleney later reported the disease involving the abdominal wall. In 1952 Wilson first used the term necrotizing fasciitis without assigning a specific pathologic bacterium that caused the disease.[3]

Majority of cases trivial trauma, often neglected, are identified as the initiating event. It may occur as a complication of surgical procedures or even after intravenous catheterization. It may also be idiopathic, as in scrotal or penile necrotizing fasciitis[2]. Historically, group A beta-hemolytic Streptococcus has been identified as a major cause of this infection. During the last 2 decades, it is reported that necrotizing fasciitis is usually polymicrobial rather than monomicrobial. Anaerobic bacteria are present in most necrotizing soft-tissue infections, usually in combination with aerobic gram-negative organisms. The rapid and destructive clinical course of necrotizing fasciitis is thought to be due to this multibacterial symbiosis and synergy,[5,6]

The frequency of necrotizing fasciitis has been on the rise because of an increase in immunocompromised patients. The common medical conditions reported as associated with occurrence of necrotizing fasciitis are diabetes mellitus, cancer, alcoholism, hypoprotenemia, peripheral vascular insufficiencies, COPD, organ transplants, HIV infection, or neutropenia. Our study aimed at identifying the predisposing factors for our population.

## METHODS

This is an observational study of consecutive 30 cases of necrotizing fasciitis admitted in a teaching hospital in Kerala, India. Cases were diagnosed based on clinical characteristics and supported with per operative finding. All the patients were treated with prompt surgical debridement; antibiotics were given based on pus culture reports. All cases were followed till discharge or death.

## RESULTS

Of the 30 cases studied, 22 were above 50 years old. 9 were female and 21 males[ figure1]. In 19 cases lower limb was involved, in 6 cases scrotum and perineum and in 3 cases abdomen was involved. Upper limb and axilla was involved in one case [table 1].In 17 cases minor trauma was reported as the initiating event and12 cases were spontaneous.18 cases were having diabetes mellitus and hypoalbuminemia was present in 13 cases. Peripheral arterial occlusive disease was present in 5 cases and 5 cases had COPD. 3 cases had chronic lymphoedema.

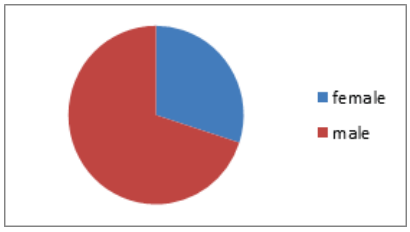


Figure 1 male to female ratio

| Site involved | No.of cases | Percentage |
|---|---|---|
| Lower limb | 19 | 63.3 |
| Scrotum and perineum | 6 | 20 |
| Abdominal wall | 3 | 10 |
| Upper limb | 1 | 3 |
| Back | 1 | 3 |

Table 1- Site of involvement

| conditions | No. Of cases | Percentage |
|---|---|---|
| diabetes | 18 | 60 |
| hypoproteinemia | 13 | 43.3 |
| POVD | 5 | 16 |
| COPD | 3 | 10 |
| lymphoedema | 2 | 6.6 |

Table 2 - Associated conditions

## DISCUSSION

Necrotizing fasciitis usually present initially with clinical picture suggestive of cellulitis. Pain will be more pronounced than usual cellulitis. As the condition progresses the skin become more erethematous and swollen with ill defined borders. Then skin rapidly develops necrosis. There will be systemic evidence of sepsis and may rapidly develops into multi organ failure. In our study all cases are reported with evidence of skin necrosis. Necrotizing fasciitis affects any age group and even neonatal cases are reported. In our study the youngest was of 31 years old male and oldest was 70 year old female.73% of cases were above 50 years. Commonest site affected is lower limb in reported series.7 This may be because the lower limb is more commonly subjected to trauma and limb may be predisposed by associated illness. In our study 19 cases lower limb was involved, in 6 cases scrotum and perineum and in 3 cases abdomen was involved. Upper limb and axilla was involved in one case. In 17 cases minor trauma was reported as the initiating event.12 cases were spontaneous in occurrence. One case involving perineum had history of recent perianal abscess drainage. Majority of cases involving the scrotum and perineum were spontaneous in occurrence.

Most of our patients were admitted with evidence of necrosis and already had antibiotic treatment. At admission itself thorough

debridement was done and swab for culture was taken from the periphery of wound. Patient was started on broad spectrum antibiotics mainly third generation cephalosporins and metronidazole. Antibiotics were changed to sensitive drugs based on culture reports. In our study no bacterial growth could be isolated in12 case. Rest of the cases polymocrobial growth were identified. Most of the reported series also support polymicrobial infection.[5] There are reported series of Vibriovulnificus infection causing necrotizing fasciitis.[8] In our study no cases of Vibriovulnificus were isolated

Diabetes mellitus is the most common predisposing factor for necrotizing fasciitis and longer hospitalization and higher mortality have been reported[9,10,11.] In our study 60% had diabetes mellitus and most these cases were of long standing duration with end organ complications. Since many had peripheral neuropathy the minor trauma were unnoticed or neglected which lead to this catastrophic event. Long standing diabetes cases predispose to this because of immunosuppression,associated POVD, and limb edema due to chronic renal failure. Hypoalbuminemia was reported in studies as predisposing factor.[12,13] Many of these patients had chronic liver disease which leads to long standing edema of lower limbs. These patients are also immunocompromised.In our study43.3% of cases had hypoalbubinemia (serum albumin level below 3gm per dl) mainly due to chronic liver disease and some had associated chronic renal failure. In our study16 % had POVD,10% had COPD and 6.6% had lymphoedema.

**CONCLUSION**

Necrotizing fasciitis is a relatively rare infection but it is associated with high morbidity and mortality. In our study diabetes mellitus and hypoalbuminemia are reported as two most frequent predisposing conditions.

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