

**NECROTISING FASCITIS 100 CASES STUDIED BETWEEN 2008-2010**Suresh Karlatti<sup>1</sup>, Uma R. B<sup>2</sup>**HOW TO CITE THIS ARTICLE:**

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**ABSTRACT:** Necrotizing fasciitis is a progressive, rapidly spreading infection affecting mainly deep fascia and may cause necrosis of skin and subcutaneous tissues. Spreading of it may lead to shock, multi organ failure and eventually death. **METHODS:** In this study, we have evaluated prevalence of predisposing factors, clinical, distribution of tissue involvement and mortality rate in 100 patients of necrotizing fasciitis at our Hospital between 2008 and 2010. **RESULTS:** Prevalence of this disease was higher in males than females with the rate of 2.6:1. Diabetes mellitus 44.0% was the most common predisposing disease followed by trauma and acquired immunodeficiency disease. Genital region was the most common site of involvement followed by lower limbs. Nonspecific erythema was the main dermatological manifestation. The most common organism was Enterococcus faecalis and mortality rate was 35.0%. **CONCLUSION:** Necrotizing fasciitis is an infectious disease with high mortality rate and frequently with non-specific skin and general manifestations. High suspicion, surgical debridement and judicious use of 3<sup>rd</sup> generation cephalosporins can be effective in decreasing the rate of morbidity and mortality.

**KEYWORDS:** Necrotizing fasciitis, Necrosis, Gangrene, Fascia, and Infection.

**INTRODUCTION:** Necrotizing fasciitis is a progressive, rapidly spreading infection subcutaneous tissue with involvement of deep fascia. It may cause gangrene of skin and subcutaneous tissue and can even results in involvement of adjacent soft tissues such as muscles (Fig. 1-3). In addition to direct spreading of the tissue necrosis to adjacent tissues, it may spread via blood vessels and lymphatics can lead to shock, multi organ failure and eventually death.<sup>1,2</sup> Prevalence of this disease in adults is higher than in children (0.5 and 0.08 cases for each 100, 000 population in adults and children respectively.<sup>3</sup> The incidence of this disease has increased about five folds during the last decade, which can be partly due to increase in the number of immune deficient patients, higher incidence of Diabetes Mellitus and even may be due to frequent reporting during the recent years. There are several predisposing factors that may lead to an increase in the susceptibility for persons to this disease.

Immune deficiency is the main factor that can be due to diabetes mellitus, AIDS, malignancies and drugs.<sup>4</sup> Each factor that influences the integrity of the skin, can result in penetration of infection. Primary infection can penetrate skin due to trauma, infected needle in intravenous drug abusers or previous dermatological diseases such as psoriasis and bed sore. Mucosal membranes in gastrointestinal or genitourinary systems are the other routes of infection.<sup>5</sup> In addition, hematogenous route plays an important role in microbial infection of this disease. Infection is often polymicrobial which can be aerobic or a mixture of aerobic and anaerobic.<sup>6</sup> Necrotizing fasciitis can involve every part of body, but limbs are the most common site of involvement in adults<sup>7</sup> and thorax and abdomen in children. Main primary dermatological manifestation is pain in the site of primary infection. Edema and erythema will develop afterwards.

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On physical examination, the skin is red, warm and swelling can be detectable which is very similar to cellulites.<sup>2</sup> Necrosis will happen after several days or weeks as a result of vascular thrombosis and then the red discoloration of skin will change to black.<sup>8,9</sup> Anatomically, a layer of necrotic tissue that is not limited with inflammatory reaction is characteristic for this infection. So the involved skin does not have clear margins.<sup>10</sup> Necrosis results in easy transmission of infection from skin to subcutaneous fat and fascial layers.<sup>2</sup> Systemic symptoms such as chills with rigor and fever, tachycardia, fatigue and weakness are other signs and symptoms. As a result of rapidly spreading infection and fatal nature of this disease, immediate diagnosis is very important. Primary diagnosis is based on suspicious of the entity, search for the other signs of infection and very fast spreading nature of the disease and fast deteriorating condition of the patient. In the next step, paraclinical findings can help us in diagnosis. Histological tests such as biopsy, blood and tissue cultures, Gram staining and radiological measures such as plain radiograph, sonography, CT or MRI (if available) are other valuable tools in diagnosis. For example, presence of gas in tissues is an important radiological finding. The most effective treatment for this disease is rapid primary diagnosis and surgical debridement. Gold standard treatment includes intravenous therapy such as 3<sup>rd</sup> generation cephalosporines (antibiotics), surgical debridement and intensive care. Surgical fasciotomy can be performed, if compartmental syndrome is imminent.<sup>10</sup> Mortality rate of up to 73% has been reported in previous studies.<sup>11</sup> This rate is directly related to the age of patients<sup>12</sup>. According to some studies, mortality rate is higher in cases with involvement of head and neck, thorax or abdomen.<sup>13</sup> As a result of high mortality rate in patients suffering from this disease and lack of enough statistical researches in this field, we decided to evaluate the prevalence of clinical and paraclinical findings in addition to predisposing factors in these patients.

**MATERIALS & METHODS:** This is a study, which was conducted at District Hospital, Belgaum attached to Belgaum Institute of Medical Sciences, Belgaum. The medical records of all patients who had been admitted to a referral department for necrotizing fasciitis from 2008 to 2010 were reviewed. The diagnosis in all patients had been confirmed by attending surgeons. 100 cases (74 male and 26 female) were found and we evaluated all of them. We did not exclude any cases. Parameters like patients' personal information, predisposing factors, clinical findings, laboratory and radiological investigations and distribution of tissue involvement were taken. We evaluated the presence of diabetes mellitus, malignancy and past history of surgery or trauma and acquired immunodeficiency disease as the main predisposing factors. Clinical findings were included both general (included fever, loss of consciousness, tachycardia, nausea, vomiting, malaise and dermatological manifestations like erythema, ulcer, gangrene, crepitation, pain, discharge and swelling. All X-Rays of the patients reassessed for the presence of any gas in the involved areas. Ultrasonography of the limbs showed the lesions were distorted, thickened fascia with fluid accumulation. Well defined, loculated abscesses were demonstrated.<sup>1</sup> Pus from deep tissues taken for culture of organisms and sensitivity for antibiotics. In addition we assessed the mortality rate and the reported etiology in each case.

**RESULTS:** In this study, 100 cases of necrotizing fasciitis evaluated which includes 74 males (74.0%) and 26 females (26.0%). Average age of patients was 44.4 (range: 22 to 80 years old). In 8 (8.0%) cases age was found to be lower than 30 years and in 28 cases (28.0%) more than 60 years. Average presenting of the case from beginning of the disease until to the hospital was 12.5 days (range: 5 to

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28 days). In evaluation of predisposing factors, diabetes mellitus was found in 44 cases (44.0%), history of trauma in 24 cases (24.0%), previous history of surgery in the involved area in 4 cases (4.0%) and acquired immunodeficiency disease in 12 cases (12%). History of surgery consisted of incision and drainage of abscess of scrotal and thigh abscess. Genital and perianal involvement was seen in 38 cases (38.0%) and in thigh region 32 cases (32.0%). In all, 80 cases (80%) had involvement of perineal region and lower limbs. Involvement of upper and lower limb was found in 20 patients (20.0%). Skin of lower part of abdomen was involved in 34 patients (34.0%) and none of the cases had upper abdomen skin problem. Skin manifestations included: erythema 64.0% (64 cases), pain 58.0% (58 cases), ulcer 47.0% (47 cases), crepitation 2.0% (2 cases), swelling 79.0% (79 cases), skin discharge 82.0% (82 cases) and gangrene 44.0% (44 cases). Loss of consciousness (altered sensorium) was detected in 12 patients (12.0%), fever of higher than 38 degree in 42 cases (42%), tachycardia (pulse rate of greater than 110 per minute) in 28 cases (28.0%) and nausea in 6 cases (6.0%). Pus culture was positive for various organisms like *Enterococcus Fecalis* 15 cases (sensitive to Amikacin, Ceftizoxime, Cefotaxime and Ciprofloxacin), *Acinetobacter* 13 cases (sensitive to Amikacin, cefotaxime, ampicillin-Sulbactam), *Staphylococcus Aureus* 10 cases (sensitive to vancomycin, Ciprofloxacin, Nafcillin, Oxacillin), *Streptococcus Pyogenes* 12 cases (sensitive to Clindamycin, Erythromycin, Ciprofloxacin, Ceftazidime), *Proteus* one case (sensitive to Ciprofloxacin, Gentamicin, Ceftazidime, Ampicillin-Sulbactam, Amikacin) and *Pseudomonas Aeruginosa* 3 cases (sensitive to Ciprofloxacin, Gentamicin, Ceftazidime, Amikacin, Ceftriaxone). In laboratory tests of patients, 70 cases (70.0%) had leucocytosis (WBC >11000) and all of them had neutrophilia. High fasting blood sugar was found in 44 cases (44.0%). 18 cases (18.0%) had an increase in the level of serum creatinine (>1.5mg/d), HIV I & II was positive in 12 cases (12%) and urine culture of 2 patients (2.0%) was reported positive for (*E.coli*). Muscles were involved in 26 cases (26.0%). Extensive surgical debridement was done for 90 patients (90.0%). 35 cases (35.0%) died and out of 35 cases, 32 cases died due to septic shock, 1 case died due to congestive heart failure and 1 case died due to chronic renal failure were reported as etiologies of deaths.

**DISCUSSION & CONCLUSION:** In this study, the number of male patients was higher than the number of female patients with the male/female ratio of 2.6:1 with the diagnosis of necrotizing fasciitis. This can be explained by relatively higher prevalence of involvement of perianal region (80%) in males. Average age of patients in this study (44.4) was lower than previous studies (53.8).<sup>7</sup> None of the case under 20 years of age was present in the present study and after trauma lack of hygiene (6 out of 8 patients) were the main reasons. Most common predisposing disease was diabetes mellitus (44%)<sup>14</sup> of the cases. That is because; diabetes affects immune system<sup>4</sup> and results in susceptibility to infections. History of trauma (24%) and immunodeficiency disease (12%) were the next most prevalent causes. About (80%) of the cases had genital, perianal regions and lower limbs. Upper limbs were involved in 20% of cases. Number of patients with lower limb involvement was higher than cases of lower limb disease. In a previous study, involvement of limbs had reported 81%<sup>14</sup> that was equal to our result. As a result of infectious and inflammatory nature of this disease, number of neutrophils in peripheral blood will increase. These factors were higher than normal in all of the cases in the present study. In this study, involvement of muscles was lower than previous studies.<sup>15</sup> The reported percentages of muscle involvement in previous studies were 46%. Mortality rate of this disease has reported up to 73% in previous studies<sup>7</sup> that was so much higher than our

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result (35.0%). This may be due to early presentation, early surgical debridement and judicious use of 3<sup>rd</sup> generation cephalosporins. In conclusion, necrotizing fasciitis is an infectious disease with relatively high mortality rate (35.0% in our study) and non-specific skin and general manifestations (Including erythema, pain, fever and ulcer). High suspicion while noticing the primary signs, laboratory investigations, surgical debridement and judicious use of 3<sup>rd</sup> generation cephalosporins can be effective in decreasing the rate of mortality and morbidity of this disease.

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**FIG. 1: Showing Gangrenous patch and necrosis in lower limb**



**FIG. 2: Showing involvement of muscles with slough**



**FIG. 3: Showing muscle involvement around genital area**

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