MORTALITY IN NECROTIZING FASCIITIS

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Objective: The objective of this study was to determine the mortality rate in patients presenting with Necrotizing Fasciitis. This prospective study was conducted at ward 26, JPMC Karachi over a period of two years from March 2001 to Feb 2003. **Methods:** All patients above the age of 12 years diagnosed to be having Necrotizing Fasciitis and admitted through the Accident and emergency department were included in this study. After resuscitation, the patients underwent the emergency exploration and aggressive surgical debridement. Post-operatively, the patients were managed in isolated section of the ward. The patients requiring grafting were referred to plastic surgery unit. The patients were followed up in outpatients department for about two years. **Results:** Over all, 25 male and 5 female patients fulfilled the inclusion criteria and were included in this study. The common clinical manifestations include redness, swelling, discharging abscess, pain, fever, skin necrosis and foul smelling discharge etc. The most common predisposing factor was Diabetes mellitus whereas the most commonly involved site was perineum. All patients underwent aggressive and extensive surgical debridements. The common additional procedures included Skin grafting, Secondary suturing, Cystostomy and Orchidectomy. Bacteroides and E. coli were the main micro-organisms isolated in this study. Bacteroides was the most common microorganism isolated among the eight patients who died. **Conclusion:** Necrotizing Fasciitis is a potentially life threatening emergency condition and carries the mortality rate of about 26.6%. The major contributing factors to increase the mortality missed initially diagnosed, old age, diabetes mellitus truncal involvement and late presentation. Anorectal involvement of disease carry worse prognosis. Hyperbaric oxygen therapy and proper use of unprocessed honey reduced the mortality rate.

Keywords: Mortality, Necrotizing Fasciitis, Microbiology.

INTRODUCTION

Necrotizing fasciitis is considered progressively destructive and invasive infection of skin, subcutaneous tissue and deep fascia. It spreads aggressively along the fascial planes whereas the muscles are relatively spared.[1-3] Bacteriology can be polymicrobial involving a synergistic combination of anaerobes and facultative species such as coliform or non-group A streptococci or mono-bacterial due to group of beta-haemolytic streptococci.[4] Necrotizing infection of the perineum was initially described by Fournier in 1884[5] and Wilson was first to coin the term necrotizing fasciitis in 1952.[6]

The infective process leads to thrombosis of subcutaneous blood vessels, resulting in gangrene of overlying skin.[7] Mortality and morbidity is very high due to late presentation. The late diagnosis occurs frequently in diabetics, immunosuppressed, intravenous drug abusers and patients with peripheral vascular disease.[5] Common sites of involvement are groin, abdomen and extremities.[3,8] Treatment involves adequate fluid replacement, broad spectrum antibiotic coverage and aggressive & repeated debridements to achieve the infection control.[9]

The objective of this study was to determine the mortality rate in patients presenting with necrotizing fasciitis in ward 26 of Jinnah Postgraduate Medical Centre (JPMC), Karachi.

PATIENTS AND METHODS

This was a descriptive study conducted at ward 26, JPMC Karachi over a period of two years from March 2001 to February 2003. This included all the patients diagnosed as necrotizing fasciitis and admitted through the accident and emergency department. The patients below 12 years of age were excluded from the study. After resuscitation in emergency room, the patients underwent emergency surgery where pus was collected for culture and sensitivity test. All necrosed material and slough was removed. Wound was irrigated with normal saline and hydrogen peroxide. The post operative treatment included correction of fluid and electrolytes balance, coagulation profile, Intravenous antibiotics (metronidazole and benzyl penicillin), daily dressings and nutritional supplementation. Antibiotics were changed later according to the culture sensitivity results. The patients were kept in isolated part of the ward. Few patients had dressing with honey but results were not satisfactory. The patients requiring grafting were referred to plastic surgery department. Later, the patients were followed up in out patients department for about two years. Data was collected with special reference to demographics, clinical features, investigations, co-morbidities, involved site, surgical intervention, outcome and follow up.

RESULTS

Overall 30 patients fulfilled the inclusion criteria and were enrolled in the study. These include 25 male and 5 female patients. The mean age was 57 years with the range of 45–80 years. Clinical

manifestations include redness, swelling, discharging abscess, pain, fever, itching, skin necrosis & foul smelling discharge, blister and ulcer, bullae and crepitus and shock. Most of the patients were diabetic and presented with uraemic symptoms. The details of pre-existing co-morbidities are mentioned in Table-1. The diversification of aetiological factors is mentioned in Table-2. The most commonly involved site was perineum followed by upper limb with trunk. The detailed description of involved sites is mentioned in Table-3. Bacteroides was the commonest isolated micro-organism followed by E. coli, Klebsiella, Proteus and Pseudomonas species. The detailed microbiological status is mentioned in Table-4. All patients underwent aggressive and extensive surgical debridements. The common additional procedures included Skin grafting, Secondary suturing, Cystostomy and Orchidectomy. The detailed description of surgical procedures is mentioned in Table-5. Blood was transfused to the patients having haemoglobin less than 10 mg/dL. X-ray abdomen showed gas in 53.3% cases and 10 patients (33.3%) were kept in ICU. Two patients had CVP line insertion for parenteral nutrition.

Eight patients died in this study and so mortality rate was 26.6%. Out of these eight patients, four were diabetic, two had hepatic failure and two had renal failure. The cause of death was sepsis with multi-organ failure in all cases. Bacteroides was the most common microorganism isolated among those who died. None of the patients having age less then 60 years died. Perineum was the commonest site involved in patients having mortality. The hospital stay was about 2 to 12 weeks in this study.

Table-1: Co-morbidities

Co-morbidity	Number (%)
Diabetes mellitus	17 (56.66%)
Peripheral vascular disease	2 (6.66 %)
Congestive heart failure	1 (3.33%)
Uraemia	5 (16.66%)
Steroid intake	1 (3.33%)
Immunosuppressive	1 (3.33%)
Idiopathic	3 (10%)

Table-2: Aetiological factors

Aetiological factor	Number (%)
Idiopathic	3 (10%)
Postoperative (Abdominal hernia repair with mesh)	2 (6.66%)
Rupture of perinephric abscess	2 (6.66%)
Scrotal/perineal abscess	5 (16.66%)
Prolonged bed sores	2 (6.66%)
After colostomy	2 (6.66%)
Postoperative herniorrhaphy	4 (13.33%)
Gunshot wound	2 (6.66%)
Peripheral abscess	2 (6.66%)
After Lord's operation	2 (6.66%)
Post-haemorrhoidectomy	1 (3.33%)
Liver cirrhosis	3 (10%)

Table-3: Site of involvement

SITE OF INVOLVEMENT	PATIENT	PERCENTAGE
Perineum and Associate Area	15	50 %
Lower Limb	4	13.3 %
Upper Limb and Trunk	7	23.3 %
Trunk Along With Extremities	4	13.3 %

Table-4: Microbiological status

MICROBIOLOGICAL STATUS	PATIENT	PERCENTAGE
Bacteroides	29	96.6 %
E Coli	27	90 %
Klebsiella	26	86 %
Proteus	26	86 %
Pseudomonas	24	80 %

Table-5: Surgical intervention

SURGICAL INTERVENTION	PATIENT	PERCENTAGE
Wide Surgical Debridement	30	100 %
Orchidectomy	2	6.6 %
Diversion Colostomy	1	3.3 %
Suprapubic Cystostomy	4	13.3 %
Skin Grafting	12	40 %
Secondary Suturing	10	33.3 %

DISCUSSION

Necrotizing fasciitis is a potentially life threatening emergency. Early diagnosis and rapid aggressive surgical intervention reduces the morbidity and mortality. Uncontrolled necrotizing fasciitis leads to sepsis, multiorgan failure and death. The overall mortality rate is reported to be around 38% in various studies.[10,11] Factors which increase the mortality rate include old age, truncal involvement, diabetes mellitus, delay in diagnoses and treatment. Rea and Wyrick[12] reported mortality rate of 67% in patients more than above the 50 years of age and 4% in patients less than 50 years of age. Failure to control the infection after first operation increases the mortality rate from 43% to 71%.[13] Pessa and Howard[14] proposed use of acute physiologic assessment and chronic health evaluation (APACHE) as a prognostic index. Death occurred in all patients whose scores increased following debridement. Mortality rate in Fournier's gangrene[15-17] varies from 3 to 45% as compared to that of necrotizing faciitis[18-21] reported as 4% to 22%. The mortality of necrotizing fasciitis of the lower limb was reported as 36% and major morbidity of amputation was about 27.8%.[22]

The major contributing factors to increase mortality in our study were truncal involvement, late presentation, old age, immunocompromised, multi-organ failure and lack of facility of hyperbaric oxygen. Antibiotic therpy is essential for treatment of necrotizing fasciitis but reduction in mortality rate is not attributable to use of such agents.[23] The involvement of more then 5% of body surface area in fourniers gangrene is reported to be associated with increased mortality rate.[24] The common portals of entry of infection are urogenital, anorectal and cutaneous infections[23]. The central principles of aggressive resuscitation before surgery as well as the aggressive debridement are the major pillars of management. The

patients may require blood transfusion and clotting factors, ventilatory support and renal support pre and post operatively. Adequate nutrition must be ensured to support wound healing and early supplementation should be considered. The high mortality reflects both the aggressive nature of infection as well as the debilitated condition of patients, contributing the mortality in spite of aggressive management.[25] The illness is more frequently seen in men with poor hygiene, diabetes, cirrhosis, intravenous drug addicts and those on aggressive chemotherapy. The mortality rate is high in the patients whose diagnosis is missed initially and are treated as a local abscess or cellulitis. Many studies have shown that hyperbaric oxygen therapy (HBO) reduces the mortality rate and enhances the prognosis.[26–29] In this study, the hyperbaric oxygen therapy was not used because facilities were not available. The literature supports the use of unprocessed honey as it halts the advancing necrosis. It debrides, sterilizes, deodorizes and dehydrates the wound. It stimulates the regeneration of the necrotizing tissue by rapid epithelialization. All these changes can be observed within a week of topical application of honey.[30,31] In this study, the results of honey were not satisfactory. The major problem was presence of flies in the wound and two patients developed maggots in their wounds. Colonic, anal and rectal involvements carry worse prognosis and may require a diverting colostomy[1] as was made in two patients in this study.

CONCLUSION

Necrotizing Fasciitis is a potentially life threatening emergency condition and carries the mortality rate of about 26.6%. The major contributing factors to increase the mortality missed initially diagnosed, old age, diabetes mellitus truncal involvement and late presentation. Anorectal involvement of disease carry worse prognosis. Hyperbaric oxygen therapy and proper use of unprocessed honey reduced the mortality rate.

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