

NECROTISING FASCIITIS : AN ENTITY REVISITED

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ABSTRACT

Necrotising fasciitis is a disease that still carries a high morbidity and mortality despite our better understanding and advances in treatment since 1924 when Meleney first studied it. In our Department of Orthopaedics, this condition appears to be on the increase, and we therefore felt this entity deserved a restudy.

Since 1985, 15 cases were seen, of which 10 were encountered in 1989. There were no recorded case prior to 1985. Our initial results show that the background and outcome parallel that of previous authors. Most were elderly with some form of underlying chronic disease. The duration from symptom onset to presentation was short, with many being in a state of septicaemia at the time of admission with fever, metabolic acidosis and marked leucocytosis. Repeated desloughings were common, and four ended up with some form of limb amputation. As with Meleney's study, the consistent pathogen cultured was B-haemolytic streptococcus.

Our recommendation is that we should be more aware of this entity in view of its fulminant course, with early and aggressive surgical intervention being the keystone to management.

Keywords: Necrotising fasciitis, B-haemolytic Streptococcus

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INTRODUCTION

Necrotising fasciitis is defined as a soft tissue infection characterised by widespread necrosis of subcutaneous tissue and fascia, with secondary necrosis of the overlying skin. Muscle is usually spared and the disease is usually accompanied by systemic toxicity.

There has been attempts to differentiate Necrotising fasciitis (NF) from other progressive necrotising surgical infections, namely Clostridial cellulitis, myonecrosis, synergistic necrotising cellulitis and Haemolytic Streptococcal gangrene but these entities seem to be variations of the same disease process (Kaiser & Cerra)⁽¹⁾.

This disease still carries a high morbidity and mortality despite our better understanding and advances in treatment since 1924 when Meleney first studied it. The entity was therefore reviewed to compare the disease pattern and trend in our hospital.

MATERIALS & METHODS

The operation log books of the Department of Orthopaedics, Toa Payoh Hospital were reviewed and the number of NF

cases between the period January 1985 to December 1989 were studied. The data included sex, age, duration of symptoms, aetiologic factors, lab findings, bacteriology and treatment methods.

There were 15 cases altogether, of which 6 had pathological confirmation while the rest had a clinical diagnosis based on operative findings. Ten of the 15 cases were encountered in 1989 alone (Table I). There were no recorded cases prior to 1985.

Table I - Retrospective Study 1985 - 1989

Year	Number
1985	0
1986	3
1987	0
1988	2
1989	10
TOTAL	15

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RESULTS

Patient background

There were 9 male and 6 female patients with 13 (87%) being in the elderly age group (more than 60 years). Twelve had a known underlying disease of which diabetes mellitus was found in 53% (8 cases) and hypertension in 27% (4 cases). Only 3 (20%) had no known disease.

Duration and Aetiology

The duration of symptoms was found to be short in most cases: 12 (80%) presenting in a matter of 2-5 days. The lower limb was involved in 87%. The triggering event seemed to be elusive in most cases, with only one-third recalling a history of some minor trauma. Fever was found in 60% at the time of admission.

Laboratory findings and Bacteriology

Marked leucocytosis with shift to the left was found in 11 patients. Three had a total white within the normal limit of 4 - 11,000. These 3 however, did have documented fever (Table II). Those with diabetes had very high blood sugar levels and 2 were in diabetic ketoacidosis by the time of their admission. A single organism was cultured in two-thirds of cases.

Table II – Laboratory Findings

Total White	
<11,000	3 (20%)
12,500	1 (7%)
>14,000	11 (73%)

Table III – Bacteriology

a. Organism	
Single	10(66%)
Polymicrobes	4(27%)
No growth	1(7%)
b. Specific Bacteria	
B-haemolytic Streptococcus	6
Staph aureus	3
Klebsiella	3
Ps aeruginosa	3
E coli	1
Proteus mirabilis	1
Enterobacter	1
Enterococcus	1
Acinetobacter	1
Anaerobes	0
Total	15

The clinical course of the disease has not changed since Meloney's time. The most common presenting complaint was severe pain in the affected region. Of significance is that the diagnosis is often missed in the early stages because the skin looks deceptively normal, only to progress rapidly to become swollen, red, warm, painful and associated with systemic toxicity (Table IV). Hence the presence of pain in disproportion to the physical findings should alert one to the diagnosis of NF instead of the usual "cellulitis".

Table IV - Clinical Presentation

Severe Pain
Fever
Skin discolouration
Progressive cellulitis
Subcutaneous crepitus
Systemic toxicity

Treatment and Outcome

Repeated desloughing were required in 8 cases (53%), with 4 ending up with some form of limb amputation. We had 4 deaths (26.7%) : 3 were among those who needed multiple desloughings. The other patient who died had only 1 desloughing done but that was because he developed medical complications of DIVC, uncontrolled diabetes, bronchopneumonia and ascites and perished before any further surgery could be done. There was no significant correlation between the deaths and delay in surgical treatment. All 4 deaths were among those 8 cases with diabetes and 3 were among the age group above 60 years.

DISCUSSION

Necrotising fasciitis is no longer an uncommon entity. Numerous studies have been done since Meloney's paper in 1924. Sudarsky and co-workers⁽²⁾ in a study of 33 cases between 1983 - 86 also added that their results suggested an increased incidence of the disease. Our study seems to parallel this - two-thirds of our cases occurring in 1989 alone. One thing striking was the frequency with which this condition is associated with an underlying chronic disease, namely diabetes and

Fig 1 – This 60-year-old diabetic came with a 2-day history of severe pain in the right foot. There was no history of trauma. Notice the characteristic blister and bullae formation.



Fig 2 – The foot after extensive desloughing was done.



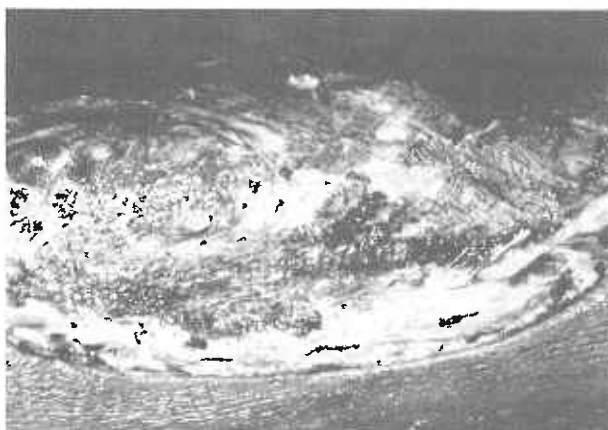
atherosclerotic vascular disease. The start-off point seems to be minor trauma, skin infection or skin injections, but a spontaneous onset is not uncommon. Diabetes was the most common in our series (53%) while 27% had hypertension. 87% of the cases were also in the elderly age group. Only 20% were otherwise healthy. Hence the common aetiology seems to be an underlying defect in the host defence system. This constant observation has been reported by all authors.

A marked leucocytosis with shift to the left pattern seems to be a common laboratory finding - 73% of our cases showed this. Other findings are anaemia, hypoalbuminaemia, elevated BUN, metabolic acidosis, coagulopathy, and radiographic evidence of gas. Hypocalcaemia have also been noted by many authors. B-haemolytic streptococcus is the most consistent organism cultured, but polymicrobials and anaerobes have also been found. In fact, Freischlag⁽³⁾ and co-workers reported that polymicrobes were cultured in 76% of their cases. Gozal et

Fig 3 – This patient had extensive fasciectomy done, showing how widespread the disease can be.



Fig 4 – Close up view of the above leg. Necrotic fascia can still be seen at the edge.



at⁽⁴⁾ postulated that it is the synergistic action between the facultative aerobes and anaerobes that is responsible for the fulminant course of the disease. Giuliano and co-workers commented that NF is a clinical pathological process affecting an

organ system, the fascia, which is independent of the specific bacteria present.

The cornerstone of treatment is early diagnosis and surgical debridement. Kaiser and co-workers⁽¹⁾ as well as Sudarsky and co-workers⁽²⁾ showed that delay in management is associated with greater morbidity and mortality. Since most patients present with systemic toxicity and dehydration, initial medical treatment of intravenous fluids and antibiotics should be started together with correction of electrolyte and acid-base imbalance. Radical debridement of necrotic tissue is then done with extensive fasciectomy needed. Because NF progresses rapidly and extensively, the wound must be frequently inspected. Repeated desloughings may be required, resorting to limb amputation as a life-saving procedure if necessary.

Multiple desloughing were needed in 8 of our cases, with 4 ending up in some form of limb amputation - illustrating the fulminance of the disease and the aggressiveness of the surgery needed. Aggressive nutritional support is also needed post-operatively. The use of hyperbaric oxygen is still controversial.

Even with adequate treatment, mortality rate remains high, ranging from 6.1 to 73%. Ours was 26.7%. The mortality rate is especially high in the presence of old age, diabetes and peripheral vascular disease. The unchanged rate since 1924 is believed to be a persistent combination of factors including delay in diagnosis, old age and underlying chronic disease.

CONCLUSION

Because NF is a rapidly progressive disease associated with significant morbidity and mortality, early diagnosis and aggressive treatment should be instituted. Our initial study shows that this entity seems to be on the rise, and with our greying population on the rise, we may expect to see more of such cases.

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