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## **An overview necrotizing fasciitis**

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## **Abstract**

Necrotizing fasciitis is basically a decaying infection of the fascia (fascia is a sheath of connective tissue that cover the Muscles ) as well as any soft tissue , necrotizing fasciitis was firstly described as *hospital gangrene* by **Joseph Jones** . the causing agents were usually coagulase positive staphylococci or beta-hemolytic streptococci , it can also occur by gram negative organisms according to experiment that had been occur in parkland hospital the initial injury some occurs outside the hospital and some are post surgical and the location of the injury most common in the lower extremity but it also can happen in upper extremity , subcostal region , abdomen ,etc ...

Necrotizing fasciitis is a rare disease that has occurred in a large city-country hospital in two or three patients a year over the past 15 years. even though necrotizing fasciitis is a treatable disease, the mortality from this disease is high .

## Introduction

Necrotizing fasciitis is a necrotic infection of the skin's deep structures, including the underlying fascia. As a completely horrifying this disease is , it's a rare disease .Necrotizing soft tissue infections are medically emergency , and the treatment requires a combination of surgical debridement of infected tissue and antibiotic therapy, the antibiotic therapy should be directed at streptococci pyogenes (*S.pyogenes* ) , **methicillin-resistant staphylococcus aureus (MRSA)** , and anaerobic and aerobic gram – negative rods, Necrotizing fasciitis has two classifications.; type I which is polymicrobial it caused by both anaerobic and aerobic bacteria ,following, diabetics and inner-abdominal surgery ,this type can cause a disease called *Fournier gangrene* which can be seen in male perineum , type II most often due to(*S.pyogenes*) and even by community acquired( *MRSA*) , it can also be caused by another type of bacteria for example ; *vibrio vulnificus* , *aeromonas* species , *clostridium perfringens* (1). Necrotizing fasciitis should be distinguished from erysipelas, and aerobic streptococcal gangrene, erysipelas is a spreading lymphangitis and cellulite with irregular reddish border and soft tissue swelling ,The skin involved in necrotizing fasciitis will be pale red without distinct violet color and mild massive edema, Whereas aerobic gangrene streptococci affected skin is hot, red , swollen , and painful it develop rapidly (2).

( *S.pyogenes*) its beta hemolytic , gram positive ,spherical to ovoid organisms , group A streptococci , non motile , non sporing ,they are aerobe and facultative anaerobes , growing best at a temperature of 37c , secretes enzymes that enable the bacterium to invade body tissues; streptokinase dissolves blood clots and one of the spreading factors; Hyaluronidase breaks down the hyaluronic acid present between the cells, deoxy ribonucleases break down the DNA released from damaged host cells and this enzyme is capable of liquefying the thick pus and may be responsible for the thin serous form of streptococcal exudates, (*S.pyogenes* )also secretes toxins hemolysins ; two hemolytic and cytolytic toxins streptolysin O (SLO) and streptolysin S (SLS) this type of toxins gives the( *S.pyogenes*) the characteristic of beta hemolytic , exotoxin A triggers an overactive immune response that destroys healthy tissues , the (*S.pyogenes*) has on its surface M protein which help it to survive phagocytosis . The secreted enzymes and toxins by (*S.pyogenes*) can damage tissue at a rate of several centimeters an hour (1)(3) . (*S. pyogenes* ) it passed from person to other and enters the body through breaks in the skin ,or it can enter to the body through a insect bite ,diabetic toe with no

history or trauma ,burn or through post –surgical etc... The (*S.pyogenes*) spreads rapidly along muscles fascia . Even though necrotizing fasciitis is a treatable disease the Mortality is high because this disease is very invasive and hard to treat , many times the bacteria will invade the blood and cause septic shock and renal failure , which often results in death .

**Aim of the study** : The aim of the study is to discuss that necrotizing fasciitis is not only caused by (*S. pyogenes* ) .

### **Methods and materials**

My report was done by the help of one study done on a patients of necrotizing fasciitis at parkland hospital they were rated in terms of age , sex ,race , location of primary infection and type of initiating injury, they also examined the existing pathological slides and had cultures of the blood and wounds. The patient who were involved in this experiment were 44 patient (2).

### **Results**

As shown in the tables 1, 2 and 3 there will be a result that indicates the bacteria that cause necrotizing fasciitis and the initial injury and the location of the injury (2).

**Table 1. Bacterial etiology of necrotizing fasciitis**

|   |    |
|---|----|
| I. hemolytic streptococcus  | 19 |
| hemolytic streptococcus –alone  | 5  |
| hemolytic streptococcus and enteric organisms   | 2  |
| Hemolytic streptococcus and staphylococcus<br>a.4 of these has enteric pathogens<br>b. 2 of these staphylococcus were hemolytic | 12 |
| II. staphylococcus  | 19 |
| Hemolytic staphylococcus  | 3  |
| Coagulase positive staphylococcus – alone   | 6  |
| Coagulase positive staphylococcus and non-hemolytic streptococcus   | 2  |
| Coagulase positive staphylococcus and enteric pathogen  | 6  |
| Gram positive cocci<br>a. 1 also had E.coli and bacteroides   | 2  |
| III. gram negative groups   | 5  |
| Hemolytic pseudomonas aeruginosa  | 2  |
| Paracolon intermedium   | 2  |
| Escheria coli   | 1  |
| IV. No growth   | 1  |

**Table 2 . Initial injury of necrotizing fasciitis**

|   |    |
|---|----|
| Those occurring outside the hospital                                  | 35 |
| a. abrasion   | 9  |
| b. cuts   | 4  |
| c. insect bite  | 2  |
| d. Boils  | 3  |
| e. Bruises  | 4  |
| f. Diabetic toe with no history or trauma                             | 2  |
| g. fall but no evidence of cuts, abrasions or any visible skin breaks | 2  |
| h. No history of injury   | 8  |
| i. burn   | 1  |
| Post-surgical   | 9  |
| a. appendectomy   | 3  |
| b. inguinal herniorrhapy  | 1  |
| c. exploratory laparotomy for stab of liver                           | 1  |
| d. gastrectomy  | 1  |
| e. aortic-iliac endarterectomy  | 1  |
| f. muscle biopsy  | 1  |
| g. hip nailing  | 1  |

**Table 3. Location of necrotizing fasciitis**

|                   |    |
|-------------------|----|
| Lower extremity   | 22 |
| Upper extremity   | 11 |
| Abdomen           | 5  |
| Inguinal region   | 3  |
| Back and buttocks | 2  |
| Subcostal region  | 1  |

## **Discussion**

From the result of their experiment they noticed that the beta hemolytic streptococci is *not the sole etiological organism*, but it may happen by different organisms , for example ; staphylococcus , gram negative bacteria such as hemolytic pseudomonas aeruginosa , escherchia coli as seen in **table 1**. In 1930 kelloway and in 1960 jandl demonstrated that staphylococcus toxins caused intravascular hemolysis and necrosis of the tissue that seen in necrotizing fasciitis . crosthwait et al. culture the streptococci organism in either mixed or pure cultures in 58% of their patients, but Wilson found streptococci in only 35% of his patients , their demonstration indicates that the disease is a clinicaly entity not by specific type of organism infection .but there is a 2 types of bacteria which are predominate (streptococcus and staphylococcus). Necrotizing fasciitis can be the product of different or combination of bacteria .

In meleneys patients and in reports by mcafferty and lyons , wilson and crosthwait et al noticed that the initiating injuries were minor injuries not detected or abrasions , minor laceration in 80% of their patients as shown in **table 2** . Many early reports were of either scrotal gangrene . necrotizing fasciitis happens in upper extremity , abdomen , inguinal region but the most common site is lower extremity as shown in **table 3**. Even they found that the antibiotics had not altered the mortality rate substantially (2) .

## **Conclusion**

To general practice, necrotizing fasciitis is a rare condition but one that risks serious morbidity. In order not to neglect this rare but life-threatening condition physicians must practice heightened caution when treating patients with erythema, pain, and fever. Necrotizing fasciitis can happen by many types of organisms but the most common organism causes necrotizing fasciitis is (*S.pyogenous*).



## References

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