



CODEN [USA]: IAJPBB

ISSN: 2349-7750

## INDO AMERICAN JOURNAL OF PHARMACEUTICAL SCIENCES

<http://doi.org/10.5281/zenodo.3404056>

Available online at: <http://www.iajps.com>

Research Article

### URGENT SURGICAL MANAGEMENT OF NECROTISING FASCIITIS AND ITS OUTCOME IN DHQ TEACHING HOSPITAL, DG KHAN

<sup>1</sup>Dr Fida Hussain, <sup>2</sup>Dr Muhammad Usman Amiruddin, <sup>3</sup>Dr Muhammad Hafeez Ullah,  
<sup>4</sup>Dr Rasheed Ahmad

<sup>1,3</sup>FCPS General Surgery, Assistant Professor DHQ Teaching Hospital, D.G. Khan, <sup>2</sup>FCPS  
Plastic Surgery, Senior Registrar DHQ Teaching Hospital, D.G. Khan, <sup>4</sup>FCPS Assistant  
Professor Surgery, D.G. Khan Medical College and Teaching Hospital D.G. Khan.

**Article Received:** July 2019

**Accepted:** August 2019

**Published:** September 2019

**Abstract:**

**Objective:** To determine the role of rapid and aggressive surgical debridement in reducing mortality and morbidity associated with necrotizing fasciitis and the role of bacteriology and antibiotic susceptibility as a result of this debilitating condition.

**Study Design:** A Retrospective Study.

**Place and Duration:** In the Surgical Unit 1 of DHQ Teaching Hospital, DG Khan for Two-year duration from August, 2017 to August, 2019.

**Methodology:** Forty patients diagnosed of Necrotising fasciitis including Fournier's gangrene were managed in this surgical unit were selected. All patients underwent emergency major debridement with broad-spectrum antibiotic treatment and regular dressing and debridement and hemodynamic support in the operating room.

**Results:** 43.5 years was the mean age of presentation with range 16-78 years. Many cases presented late after five days of the disease onset. In most cases predisposing causes were found. When necrotizing fasciitis was suspected, a rapid and rapid surgical approach was initiated with immediate antibiotic and major debridement in the operating room and regular small debridement in the ward and if necessary, in the operating room. Mortality was 6 in this study.

**Conclusion:** Early diagnosis, all necrotic tissues radical surgical debridement, forceful nutritional support and broad-spectrum antibiotics are specific treatment options for necrotizing fasciitis.

**Key words:** Necrotizing fasciitis, surgical debridement, intravenous antibiotics.

**Corresponding author:**

**Dr Fida Hussain,**

FCPS General Surgery, Assistant Professor DHQ Teaching Hospital,  
D.G. Khan. [Surgeonfidahussain@gmail.com](mailto:Surgeonfidahussain@gmail.com)

QR code



Please cite this article in press Fida Hussain et al., Urgent Surgical Management of Necrotising Fasciitis and Its Outcome in Dhq Teaching Hospital, Dg Khan., Indo Am. J. P. Sci, 2019; 06(09).

**INTRODUCTION:**

Necrotizing fasciitis (NF) is the infection of soft tissue determined by rapid spread of inflammation and subsequent muscle fascia necrosis, subcutaneous fat and, in some cases, signs of epidermis and systemic toxicity [1]. Necrosis is generally limited to the plane of the muscle fascia and in some cases the skin can be salvaged [2]. There are two clinical categories. Necrotizing fasciitis Type I is a polymicrobial infection initiated by anaerobic and aerobic bacteria and is usually seen in patients with underlying medical or surgical problems. Type II necrotizing fasciitis denotes mono-microbial infection instigated by group A streptococci and rarely cMRSA-induced necrotizing fasciitis (defined as community-associated methicillin-resistant *Staphylococcus aureus* as a mono-microbial infection) [3]. Type II can occur in patients of any age set and deprived of complex medical conditions. Preparatory factors comprise closed trauma history, tissue hypoxia, PMLN dysfunction, liquefactive necrosis, proliferation of anaerobic bacteria, chicken pox, the use of injectable drugs, birth, injuries, surgical procedures, penetrations, exposure to a "case", and injuries such as burns [4]. The other two types of infections, which are generally penetrating accepted as necrotizing fasciitis types, are Fournier's gangrene and cervical necrotizing fasciitis. Fournier's gangrene is the uncommon and mostly causes the fulminant necrotizing fasciitis of the genital perineum and genital region normally because of synergistic polymicrobial infection. This is truly emergency situation which must be deal accordingly and typically seen in diabetic, elderly and immune-compromised patients.

Similarly, there is recurrent overlap between spontaneous gangrenous myositis and necrotizing fasciitis<sup>5</sup>. Early necrotizing fasciitis recognition is significant as a marked process can proceed fairly

rapidly to those related with intense systemic toxicity, tissue destruction, death or loss of limb<sup>6</sup>. In this case, mortality and morbidity are very high due to late delivery and late diagnosis of the disease, because in most cases the early clinical diagnosis of the necrotizing fasciitis area is difficult and can be confirmed only after intervention Surgery [7-8].

**MATERIALS AND METHODS:**

This Retrospective Study was held in the Surgical Unit 1 of DHQ Teaching Hospital, DG Khan for Two-year duration from August, 2017 to August, 2019.

40 total patients were selected for the study. Most of the patients were delayed and, in most cases predisposing causes were present.

**Including criteria**

All patients with necrotizing fasciitis and Fournier's gangrene. The diagnosis of NF is confirmed mainly on clinical basis and by MRI and frozen section.

**Exclusion Criteria**

Other skin infections and Dermatological problems.

**Diagnostic Criteria:**

1. Sudden Onset of Pain
2. Swelling
3. Toxaemia
4. Area of Erythema (spreads quickly into the normal skin without sharp demarcation)
5. Purplish and Dusky Skin (Multiple identical patches of gangrenous skin)
6. Skin Gangrene (Bullae with fascial necrosis, local crepitus, putrid discharge.
7. MOF, fever and shock.

If the above criteria score is above six have high suspicion of NF and if it is above eight it is labelled as high risk of necrotising fasciitis.

Clinical Findings	Type 1	Type 2	Gas Gangrene	Pyomyositis	Myositis viral/ parasitic
Fever	++	++++	+++	++	++
Diffuse Pain	+	+	+	+	++++
Local Pain	++	++++	++++	++	++
Systemic Toxicity	++	++++	++++	+	+
Gas in Tissue	++	-	++++	-	-
Obvious portal of entry	++++	+	++++	-	-
DM	++++	+	-	-	-

Unexplained pain rises rapidly over time and may be the 1<sup>st</sup> necrotizing fasciitis sign. When necrotizing fasciitis is supposed, it is especially suspected in patients with micro-system-related results such as tachycardia, fever, tense edema outside the affected skin, hypotension, blisters / blisters, disproportionate pain, subcutaneous gas, crepitation and soft tissue infection. The following principles were adopted. Intravenous antibiotics containing ampicillin or ampicillin-sulbactam combined with Metronidazole were immediately initiated. Patients who were previously hospitalized or recently on antibiotics, using ticarcillin-clavulanate, piperacillin-tazobactam, fluoro-quinolone, or third-generation cephalosporin. These antibiotics were used until the results of certain cultures and the sensitivity of the organisms were present. An aggressive and comprehensive emergency debridement was performed in all necrotic tissues (subcutaneous tissues, skin and fascia) until healthy bleeding tissue was reached. With iodine, hydrogen peroxide and saline; wound was thoroughly washed. For culture and histopathological examination; excised tissues were sent. Less than 12 hours later, the wound was examined and, if necessary, additional debridement was performed. In addition to the two main OT days in the main operating room during

hospitalization, all wounds were examined regularly in the morning and afternoon rounds. Two bandages and necrosectomy were performed daily. When healthy granulation tissue appeared in the local wound dressing, the wound culture was performed with normal saline until it isolated any organism, and strict procedures for wound closure were performed. Precise procedures such as secondary closure, discrete thickness skin graft and fasciocutaneous flap were performed depending on the skin defect, patient's age and viability of the tissues. After recovery, the patients were discharged and followed up for 3-6 months.

#### RESULTS:

40 total patients with necrotizing fasciitis including Fournier's gangrene were admitted to our unit and were included for two years study after informed consent. The mean age of presentation was 43.5 years (range 16-78). Twenty-nine patients (72.5%) who presented late 5-6 days after the onset of symptoms had pain, fever, swelling and erythema in the affected area, and 17 patients (42.6%) had cracking. At the first examination, 9 (22.5%) patients reported a flu-like disease before the development of skin infection symptoms, while 27 (67.7%) reported fever associated with body pain.

**Table I. Isolated organisms and their percentage**

Organisms	No.	%
<b>Streptococcus species</b>	<b>8</b>	<b>20</b>
<b>Corynebacterium</b>	<b>5</b>	<b>12.5</b>
<b>Staphylococcus species</b>	<b>7</b>	<b>17.5</b>
<b>Escherichia coli (E. coli)</b>	<b>9</b>	<b>22.5</b>
<b>Bacteroides species</b>	<b>6</b>	<b>15</b>
<b>Pseudomonas</b>	<b>5</b>	<b>12.5</b>
<b>Clostridium welchii</b>	<b>4</b>	<b>10</b>
<b>Prevotella</b>	<b>3</b>	<b>7.5</b>
<b>Proteus species</b>	<b>7</b>	<b>17.5</b>
<b>Peptostreptococcus</b>	<b>3</b>	<b>7.5</b>
<b>Porphyromonas species</b>	<b>2</b>	<b>5</b>
<b>Enterococci</b>	<b>7</b>	<b>17.5</b>

When it comes to predisposing conditions, 5 patients after laparotomy (2 firearms), 4 patients' minor trauma, 4 patients dorsal carbide, 3 patients intra gluteal / intra deltoid injection, 2 patients snake bites, 2 patients union of skin, 2 patients psoas abscess, 2 ' appendectomy in 2 patients, limb injury in 2 patients, intravenous drug addict in 2 patients, palmer fissure in

1 patient, no cause was identified in the remaining patients. The common medical conditions seen in these cases were diabetes mellitus in 23 (57.50%) patients, chronic renal failure in 9 (22.50%), liver failure in 7 (17.5%) and tuberculosis in 5 (12.50%) patients.

Predisposing Factors	%	No. of Dedridements	Hospital Stay (Avg)	Outcome Died/Recovered	No. of Patients
<b>Idiopathic</b>	<b>17.5</b>	<b>4</b>	<b>22</b>	<b>2/5</b>	<b>7</b>
<b>Trauma</b>	<b>10</b>	<b>4</b>	<b>9</b>	<b>0/4</b>	<b>4</b>
<b>I/M Injections</b>	<b>7.5</b>	<b>3</b>	<b>21</b>	<b>0/4</b>	<b>3</b>
<b>Boil on skin</b>	<b>5</b>	<b>3</b>	<b>26</b>	<b>0/2</b>	<b>2</b>
<b>Psoas Abscesses</b>	<b>5</b>	<b>4</b>	<b>17</b>	<b>0/2</b>	<b>2</b>
<b>Post Lapratomy</b>	<b>12.5</b>	<b>6</b>	<b>32</b>	<b>1/5</b>	<b>5</b>
<b>Carbuncle</b>	<b>10</b>	<b>4</b>	<b>21</b>	<b>0/4</b>	<b>4</b>
<b>Post append</b>	<b>5</b>	<b>3</b>	<b>39</b>	<b>0/2</b>	<b>2</b>
<b>Post ileostomy</b>	<b>5</b>	<b>5</b>	<b>26</b>	<b>0/2</b>	<b>2</b>
<b>Firearm</b>	<b>5</b>	<b>4</b>	<b>17</b>	<b>1/2</b>	<b>2</b>
<b>Palmer fissure</b>	<b>2.5</b>	<b>3</b>	<b>13</b>	<b>0/1</b>	<b>1</b>
<b>Snake bite</b>	<b>5</b>	<b>5</b>	<b>41</b>	<b>1/1</b>	<b>2</b>
<b>IV Drug Users</b>	<b>5</b>	<b>4</b>	<b>22</b>	<b>1/1</b>	<b>2</b>
<b>FA injuries to legs</b>	<b>5</b>	<b>3</b>	<b>29</b>		<b>2</b>

**Table II. Presentation and outcome of patients**

These 11 (27.5%) patients had more than one of the previous conditions. All patients underwent an aggressive surgical debridement. Twenty-four hours after admission, 17 patients were operated, and 9 patients were operated within 3 to 4 days, 6 patients were delayed from patients seeking late help in the hospital, and the delay in the remaining patients was mostly slower. Antibiotics were started immediately and were taken for pus culture, and all subjects' first debridement session and antibiotic susceptibility were

changed accordingly. In our study, the cases of Fournier's gangrene were managed on urgent basis by wound excision until the healthy tissue was observed. Once the granulation tissue was formed over the wound the patients were done with skin grafting and the result were good anatomically and functionally.

The pre-operative and post-operative pictures of Fournier's gangrene after wound excision and after skin grafting are given below.





### DISCUSSION:

In 1924, Melany and Cullen described an infectious process in subcutaneous tissue separately, calling it skin gangrene and synergistic gangrene, respectively [9]. The term 'necrotizing fasciitis' was introduced by Wilson in 1952. The bacteriology of the condition is highly variable and has changed over time. Years in literature. Various synergistic infections have been reported, but no specific combination has been found to be particularly relevant. In this study, we found multi-bacterial aetiology in almost all cases [10]. Bacteria can be isolated from almost all cases of necrotizing fasciitis type I. In two series from Maryland and Singapore, two-thirds had mixed aerobic and anaerobic bacteria. Type II necrotizing fasciitis causes VAS and was previously called streptococcal gangrene. In the 1990s, there was a dramatic increase in the number of invasive infections such as necrotizing fasciitis caused by GAS. Although the literature review involving five prospective studies did not show a correlation, the development of anti-nsteroidal anti-inflammatory drugs (NSAIDs) and necrotizing VAS infection, in this study, 12 patients had a history of NSAID use. However, it can be said that NSAIDs may mask the usual signs of inflammation, thus delaying the diagnosis. Laboratory findings are usually non-specific Blood tests usually show leukocytosis with marked left shift coagulopathy and increased studies in serum concentrations of lactate, creatine kinase a, and creatinine Several studies have been conducted on the role of intravenous immunoglobulin in neutralization [11-12]. Treatment of circulating streptococci when hypotension occurs. There appears to be little doubt that some IVIG groups contain neutralizing antibodies against certain clostridial toxins and streptococcal supernatants [13]. We could not use IVIG be Even with the best

treatment, necrotizing fasciitis is associated with significant mortality. In different studies, mortality rates are associated with mortality in 21% of patients with type I necrotizing fasciitis, 14% with type II necrotizing fasciitis, and infection in patients with streptococcal toxic shock syndrome. GAS is 22 percent in patients with cervical necrotizing fasciitis and 22 to 40 percent in patients with Fournier's gangrene [14]. Hyperbaric oxygen therapy may reduce mortality and limit Fournier's degree of debridement in gangrene and necrotizing fasciitis, but the results are conflicting. An observational study of 26 patients with Fournier's gangrene found the mortality rate significantly lower in HBO-treated patients (42% versus 7%). In a second observational study of 29 patients with necrotizing fasciitis, significantly lower debridement and a lower mortality rate (66 vs. 23 percent) were recorded when HBO was used. In contrast, a larger study of 42 patients with Fournier's gangrene showed an increase in mortality, morbidity, and cost of treatment among HBO-treated patients [15]. In this study, we do not use HBO treatment. In our 40 patient's series, 6 patients died, so our mortality was 15%.

### CONCLUSION:

The key to the treatment of patients with necrotizing fasciitis is urgent aggressive surgical debridement in all necrotic tissues. Simultaneously also start intravenous fluid therapy and broad-spectrum antibiotic therapy and treat systemic diseases such as diabetes because they are widely available in Pakistan and most patients cannot afford them.

### REFERENCES:

1. Qadir, Muhammad Imran, and Maira Naeem. "Sentiment Of Post Graduate Students About

- Necrotizing Fasciitis Infection (Soft Tissue Inflammation)." *International Journal Of Medical Science And Clinical Research Studies* 1, no. 1 (2019): 16-18.
2. Hill, Harry R. "Fitness genes of group A streptococci in necrotizing fasciitis and myositis." *The Journal of clinical investigation* 129, no. 2 (2019).
  3. Yamamuro, Tadashi, Aya Fukuhara, Jinkoo Kang, and Jumpei Takamatsu. "A case of necrotizing fasciitis following *Edwardsiella tarda* septicemia with gastroenteritis." *Journal of Infection and Chemotherapy* (2019).
  4. Cruddas, L., A. Al-Midani, N. Banga, G. Jones, and P. E. Butler. "A Rare Presentation of *Escherichia coli* Necrotizing Fasciitis in Renal Transplantation." *Experimental and clinical transplantation: official journal of the Middle East Society for Organ Transplantation* (2019).
  5. Wong, Ronald MY, Leo T-C. Chau, Michael C-K. Mak, Wing-Lim Tse, and Pak-Cheong Ho. "Necrotizing fasciitis induced by *Vibrio vulnificus* in patients without marine contact in Hong Kong." *Journal of Orthopaedic Translation* (2019).
  6. Tarnutzer, A., Andreoni, F., Keller, N., Zürcher, C., Norrby-Teglund, A., Schüpbach, R.A. and Zinkernagel, A.S., 2019. Human polyspecific immunoglobulin attenuates group A streptococcal virulence factor activity and reduces disease severity in a murine necrotizing fasciitis model. *Clinical Microbiology and Infection*, 25(4), pp.512-e7.
  7. Mtenga, Arnold A., Boniphace M. Kalyanyama, Sira S. Owibingire, Karpal S. Sohal, and Elison NM Simon. "Cervicofacial necrotizing fasciitis among patients attending the Muhimbili National Hospital, Dar es Salaam, Tanzania." *BMC infectious diseases* 19, no. 1 (2019): 642.
  8. Lee, Ching-Yu, Tsan-Wen Huang, Meng-Huang Wu, Tsung-Jen Huang, Yan-Rong Li, Evelyn Jou-Chen Huang, and Yao-Hung Tsai. "Risk factors of synchronous multifocal necrotizing fasciitis: a case control study in comparison with monofocal necrotizing fasciitis in Taiwan." *BMC infectious diseases* 19, no. 1 (2019): 513.
  9. Al Obaidi, N. F., J. Carlson, O. Bey, and A. Al Twal. "Oven Cleaner an Unexpected Catalyst of Facial Necrotizing Fasciitis and Subsequent Respiratory Failure in an HIV-Infected Older Woman." In *D48. CRITICAL CARE CASE REPORTS: INFECTION AND SEPSIS II*, pp. A6628-A6628. American Thoracic Society, 2019.
  10. Lin, C.N., Hsiao, C.T., Chang, C.P., Huang, T.Y., Hsiao, K.Y., Chen, Y.C. and Fann, W.C., 2019. The Relationship Between Fluid Accumulation in Ultrasonography and the Diagnosis and Prognosis of Patients with Necrotizing Fasciitis. *Ultrasound in medicine & biology*.
  11. Andrea, Minini, Galli Stefano, Salvi Andrea, and Zarattini Guido. "Necrotizing fasciitis of the hand: a case report." *Acta bio-medica: Atenei Parmensis* 90, no. Suppl 1 (2019): 162.
  12. Basso, Arthur, Filip Moerman, Christophe Ronsmans, and Martine Demarche. "Necrotizing myositis case report and brief literature study." *Acta Clinica Belgica* (2019): 1-5.
  13. Yoon, Min A., Hye Won Chung, Yujin Yeo, Hye Jin Yoo, Yusuhn Kang, Choong Guen Chee, Min Hee Lee, Sang Hoon Lee, and Myung Jin Shin. "Distinguishing necrotizing from non-necrotizing fasciitis: a new predictive scoring integrating MRI in the LRINEC score." *European radiology* 29, no. 7 (2019): 3414-3423.
  14. Naseer, U., H. Blystad, L. Angeloff, K. Nygård, L. Vold, and E. Macdonald. "Cluster of septicaemia and necrotizing fasciitis following exposure to high seawater temperatures in southeast Norway, June to August 2018." *International Journal of Infectious Diseases* 79 (2019): 28.
  15. Chang, Chia-Peng, Wen-Chih Fann, Shu-Ruei Wu, Chun-Nan Lin, and Cheng-Ting Hsiao. "Lactate on emergency department arrival as a predictor of in-hospital mortality in necrotizing fasciitis: a retrospective study." *Journal of orthopaedic surgery and research* 14, no. 1 (2019): 73.