

A Clinical Study of Fournier's Gangrene**Akhilesh Ratnakar¹, Deepak Shrivastava^{2*}, Sunil Kumar Saxena³, Megha Shyam⁴**^{1,3}MBBS, MS General Surgery, Associate Professor, Department of Surgery, Bundelkhand Medical College, Sagar (M.P.)²MBBS, MS General Surgery, Professor and Head of Department, Department Of Surgery, Bundelkhand Medical College Sagar (M.P.)⁴MBBS, PG Resident General Surgery, Department of Surgery, Bundelkhand Medical College, Sagar (M.P.)

Received: 18-09-2023 / Revised: 21-10-2023 / Accepted: 26-11-2023

Corresponding author: Dr. Megha Shyam

Conflict of interest: Nil

Abstract:

Introduction: Fournier gangrene is necrotizing fasciitis or gangrene affecting the external genitalia and/or Perineum. Fournier's gangrene is a surgical emergency, and because of differences in clinical presentation, patients may initially be encountered in a variety of clinical settings. Delay in diagnosis and treatment of this condition can be fatal, it is very important not to ignore symptoms, even if the symptoms are not specific. After Fournier's gangrene is diagnosed, proper treatment is very important. It is more likely to occur in Diabetics, alcoholics, or those who are immunocompromised.

Aim of study: To find out various etiological factors and course of management in patients presenting with Fournier gangrene in Bundelkhand medical college.

Objectives: 1. To study the mode of presentation of the disease. 2. To find the factors associated with Fournier gangrene. 3. To find the commonest microorganism and antibiotic sensitivity associated with Fournier gangrene.

Results: The commonest presenting features are scrotal pain, erythema and swelling at scrotum, fever, blisters or skin necrosis at scrotum. Alcoholism and Diabetes were the major risk factors. Commonest agent causing infection was found to be E. coli. Amikacin is the most sensitive antibiotic followed by Ceftriaxone and Meropenem.

This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

Introduction

Fournier's gangrene is a necrotizing fascia infection that affects the genital and perianal regions, and caused by extensive soft tissue necrosis by rapidly progressing between fascial planes, when its diagnosis and management are delayed. This emergency surgical condition is associated with a high mortality rate.[1-5].

About One Per 62,500 Males Are Affected Per Year [1]. Fournier's gangrene was first described by Baurrienne in 1967 and Jean Alfred Fournier in 1983 as a broad perineal necrotizing soft tissue infection. Fournier's gangrene is characterized by the progressive spread of necrosis to the skin and subcutaneous tissue along with polymicrobial infections caused by aerobic and anaerobic bacteria [2,6,7].

Any trauma in the perineal area or infection in the urinary tract forms the initial focus of the disease. Fournier's gangrene is seen in general in patients with immune disorders such as diabetes, alcoholics,

seniors, seropositivity, and malnutrition [5,6,8,9,10]. Symptoms vary from pain in the anorectal or genital area with minimal presentation of symptoms in the form of skin necrosis, necrosis that rapidly spreads to the skin and soft tissue, and systemic sepsis without a clear source of infection [2]. Fournier's gangrene is a surgical emergency, and because of differences in clinical presentation, patients may initially be encountered in a variety of clinical settings. Delay in diagnosis and treatment of this condition can be fatal, it is very important not to ignore symptoms, even if the symptoms are not specific. After Fournier's gangrene is diagnosed, proper treatment is very important. Despite advances in its diagnosis and treatment, the mortality rate due to Fournier's gangrene remains as high as 16-50%. (11,12,13).

In The Present Study, We Are Studying Patients Admitted in Department Of Surgery Presenting With Fournier's Gangrene in terms of presentation

of disease, predisposing factors, and management of Fournier gangrene.

Aims and Objectives:

Aim of study- To find out various etiological factors and course of management in patients presenting with Fournier's gangrene in Bundelkhand medical college.

Objectives

1. To study the mode of presentation of the disease
2. To find the factors associated with Fournier gangrene.
3. To find the commonest microorganism and antibiotic sensitivity associated with Fournier gangrene.

Materials and Methods

Prospective observational study of 30 patients who were diagnosed with Fournier gangrene was done. Study was from 01 January 2023 to 30 June 2023 for a period of six months. Study was performed after Taking Consent.

A Detailed History Was Taken From All Patients And Investigations Such As Hemogram, Urine And Blood Sugar, Were Taken At The Time Of Admission. Pus For Culture Sensitivity Was Taken At The Time Of First Debridement.

All Patients Underwent Debridement Within 6 Hours Of Admission Either Under General Or Under Local Anesthesia.

The Data Analysis Was Done With M.s Office 2016, Simple Ratios And Proportions Was Taken.

Results and Observations

Table 1:

| Signs and symptoms | Number of patients | Percentage |
|--------------------------------------|--------------------|------------|
| Pain at scrotum | 30 | 100% |
| Erythema and swelling at scrotum | 30 | 100% |
| Fever | 30 | 100% |
| Blisters or skin necrosis at scrotum | 30 | 100% |
| Crepitus | 14 | 46.2% |
| Discharge from wound | 10 | 33.3% |

Table 2: Predisposing Factors

| Predisposing factors | Number of patients | Percentage |
|-----------------------|--------------------|------------|
| Diabetes mellitus | 18 | 60% |
| Alcohol intake | 7 | 23.1% |
| Trauma | 2 | 6.6% |
| Chronic liver disease | 2 | 6.6% |
| Renal disease | 1 | 3.3% |

Table 3: Culture and sensitivity

| Micro organism | Number of patients | Percentage |
|-------------------|--------------------|------------|
| Escherichia coli | 13 | 42.9% |
| Klebsiella sp | 7 | 23.1% |
| Pseudomonas sp | 4 | 13.2% |
| Staphylococcus sp | 4 | 13.2% |
| Streptococcus sp | 2 | 6.6% |

Table 4: Antibiotic sensitivity

| Antibiotic | Number of patients | Percentage |
|--------------|--------------------|------------|
| Amikacin | 19 | 63% |
| Clindamycin | 15 | 50% |
| Ceftriaxone | 18 | 60% |
| Levofloxacin | 10 | 33.3% |
| Meropenem | 16 | 53.3% |

Discussion: The diagnosis of Fournier's gangrene is generally made clinically where in this study all patients presented with symptoms of fever, pain at scrotum and 33.3% of patients had a complaint of pus discharge from the scrotal region, all patients had erythema associated with blistering or necrosis at the scrotum 46.2% of patients had crepitus at the scrotum. Early diagnosis is central to the successful

treatment of Fournier's gangrene and a favourable prognosis. Although radiological techniques such as X-rays, ultrasonography, computed tomography, and magnetic resonance imaging are helpful for making a diagnosis. In this study Diabetes mellitus (60%), alcoholism (23.1%), trauma (6.6%), liver disease (6.6%), renal failure (3.3%), and other conditions suppressing immune functions are

predisposing factors for Fournier's gangrene. Among these factors, DM is the most common predisposing factor. Diabetes leads to increased susceptibility to infections owing to the suppression of chemotaxis, phagocytosis, and immune functions. Most of our study population (60%) was diabetic.

Etiological factors for Fournier's gangrene include perineal, urogenital, and anorectal disorders as well as surgical interventions in these regions. An effective resuscitation, wide-spectrum antibiotic therapy was started initially, and aggressive debridement of necrotic tissues formed the initial management of the disease. All necrotic and infected tissues should be debrided until healthy tissues can be observed and pus was collected and sent for culture and sensitivity. Most of the pathology was due to E.COLI(42.9%) followed by klebsiella sp (23.1%) majority of the infection was due to gram negative bacteria and thus initial antibiotic therapy was mainly focused towards gram negative species. After the reports of culture and sensitivity antibiotic treatment was modified according to sensitivity with Amikacin (63%) being the most sensitive antibiotic followed by ceftriaxone (60%), Meropenem (53.3%), clindamycin (50%). Selective antibiotic therapy was followed by daily cleaning and dressing, some patients required multiple debridement attempts but at the end there was no mortality during the study. The prognosis of Fournier's disease depends on its early diagnosis and treatment. Delays in the diagnosis and treatment, primary anorectal disease, advanced age, female gender, DM, malignant disorders, multiple organ failure at admission, and a high Fournier's gangrene index are predictors of a poor prognosis. Despite advances in its diagnosis and treatment, the mortality rates associated with Fournier's gangrene remains as high as 16–50%.

Conclusion:

In conclusion, Fournier's gangrene is a surgical emergency that develops acutely and progresses rapidly and insidiously.

A potential mortality and morbidity can be drastically reduced with prompt diagnosis and emergency management followed by selective antibiotic treatment and daily dressings

Summary:

1. The commonest presenting features are pain at scrotum, fever, erythema and swelling at scrotum, blisters or skin necrosis at scrotum.
2. Diabetes (60%) and chronic alcoholism (23.1%) are the more common risk factors.
3. E.coli (42.9%) is the most common microorganism causing the infection followed by klebsiella (23.1%) and pseudomonas

(13.2%) suggesting the gram negative bacteria preponderance of the infection.

4. Amikacin (63%) is the most sensitive antibiotic followed by ceftriaxone (60%) and Meropenem (60%).

References

1. Geraci G, Pisello F, Lupo F, Cajozzo M, Sciume C, Modica G. Fournier's gangrene: case report and review of recent literature. *Ann Ital Chir* 2004; 5:97–106.
2. Canbaz H, Caglikulekci M, Altun U, Dirlik M, Turkmenoglu O, Tasdelen B, et al. Fournier's gangrene: analysis of risk factors affecting the prognosis and cost of therapy in 18 cases. *Ulus Travma Acil Cerrahi Derg* 2010; 16:71–6.
3. Taviloglu K, Cabioglu N, Cagatay A, Yanar H, Ertekin C, Baspinar I, et al. Idiopathic necrotizing fasciitis: risk factors and strategies for management. *Am Surg* 2005; 71:315–20.
4. Oguz A, Gümüş M, Turkoglu A, Bozdog Z, Ülger BV, Agacayak E, et al. Fournier's Gangrene: A summary of 10 years of clinical experience. *Int Surg* 2015; 5:934–41.
5. Erdogan A, Aydogan I, Senol K, Uckan EM, Ersoz S, Tez M. Simple scoring system for prediction of mortality in Fournier's gangrene. *Eur J Trauma Emerg Surg* 2016; 42:513–8. [CrossRef]
6. Oymacı E, Coskun A, Yakan S, Erkan N, Ucar AD, Yıldırım M. Evaluation of factors affecting mortality in Fournier's Gangrene: Retrospective clinical study of sixteen cases. *Ulusal Cer Derg* 2014; 30:85–9.
7. Czymek R, Schmidt A, Eckmann C, Bouchard R, Wulff B, Laubert T, et al. Fournier's gangrene: vacuum-assisted closure versus conventional
8. Canbaz H, Caglikulekci M, Altun U, Dirlik M, Turkmenoglu O, Tasdelen B, et al. Fournier's gangrene: analysis of risk factors affecting the prognosis and cost of therapy in 18 cases. *Ulus Travma Acil Cerrahi Derg*. 2010; 16(1):71–76. [PubMed] dressings. *Am J Surg* 2009; 197:168–76.
9. Ruiz-Tovar J, Córdoba L, Devesa JM. Prognostic factors in Fournier gangrene. *Asian J Surg*. 2012; 35(1):37–41.
10. Kuo CF, Wang WS, Lee CM, Liu CP, Tseng HK. Fournier's gangrene: ten-year experience in a medical center in northern Taiwan. *J. Microbiol Immunol Infect*. 2007; 40(6):500–506.
11. Benjelloun EB, Souiki T, Yakla N, Ousadden A, Mazaz K, Louchi A, et al. Fournier's gangrene: our experience with 50 patients and analysis of factors affecting mortality. *World J Emerg Surg* 2013; 8:13.
12. Yılmazlar T, Isık O, Ozturk E, Ozer A, Gulcu B, Ercan I. Fournier's gangrene: Review of

120 patients and predictors of mortality. Ulus
Travma Acil Cerrahi Derg 2014; 20:333–7.
13. Furr J, Watts T, Street R, Cross B, Slobodov
G, Patel S. Contemporary trends in the

inpatients management of Fournier’s gangrene:
Predictors of length of stay and mortality based
on population-based sample. Urology 2017;
102:79-84.