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## **A clinical study of Fournier's gangrene tertiary care center government medical college, Nizamabad**

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**Abstract**---Background: Fournier's gangrene (FG) is fast-spreading necrotizing gangrene that affects the perineum, perianal, and genital regions, but spares the testicles, bladder, and rectum due to their independent blood supply from the aorta. The purpose of this research is to share our experience managing 32 cases. Patients and method: Between April 2018 and May 2022, researchers from Government Medical College in Nizamabad conducted a prospective cross-sectional study of patients with FG. During the study period, all individuals diagnosed with FG and treated for it were included. Age, sex, hospital stay, premorbid conditions, mobility, mortality, laboratory examinations, and therapies performed are among the data collected from these. Results: A total of 38 patients were seen throughout the study, with four patients being eliminated due to missing data, leaving 32 patients for the final analysis. With a male to female ratio of 15:1, there were 30 (93.75%) males and 2 (6.25%) females. The shortest hospital stay was three to five weeks, while the longest was 18 to twenty weeks. 46.88% of the patients had urethral stricture with a watering can perineum as a predisposing factor, 11 (34.44%) had diabetes mellitus, 5 (15.62%) had perineal injuries as predisposing factors, 6 (18.72%) patients had uremia, and one patient (3.12%) each had bladder tumor and scrotal abscess as predisposing factors. Only 18 (56.25 %) of the participants in this study had positive aerobic bacterial culture results. Polymicrobial bacterial growth was found in

14 (77.77%) of the samples, while monomicrobial bacterial growth was found in 4 (22.23%). The most common bacterial species isolated were *Escherichia coli* (27.77%) and *Staphylococcus aureus* (11.11 %). Conclusion: The pattern of FG infection, which is a fast progressing, fulminant polymicrobial synergistic infection of the perineum and genitals, is presently evolving. Early detection of infection, as well as invasive and vigorous treatment, is critical in reducing these prognostic variables. Antibiotic susceptibility testing is still crucial in the treatment of this illness.

**Keywords**---Fournier's Gangrene, management, predisposing factor.

## Introduction

Fournier's gangrene (FG) is an uncommon, fulminant necrotizing fasciitis affecting the perineum, perianal, and vaginal areas that can progress up to the abdominal wall between the fascial planes [1]. FG initially defined the syndrome as a sickness of young people with no known etiology [2]. It is caused by a synergistic action of aerobic and anaerobic bacteria in a polymicrobial illness [3–5]. FG mostly affects males, although it also affects women (approximately 10% of the population) and children [6, 7]. In 95% of cases, the source of infection can be identified, with the most common causes being anorectal, genito-urinary, and cutaneous [8]. Diabetes mellitus, local trauma, urine leakage, perirectal or perineal surgery, periurethral ex-tension, anal infection, anorectal abscess, genitourinary infection, alcoholism, immunosuppression, and renal or hepatic illness are all predisposing factors [9, 10]. Clinical symptoms and physical examination are used to make a diagnosis. Although radiological procedures can aid in determining the degree of the disease, false negatives can occur. Several studies attempted to assess the utility of various scoring systems. Fournier's Gangrene Severity Index (FGSI) has become a gold standard for researchers, as it is consistently reported in FG literature and is regarded as a predictive factor [11, 12].

*Escherichia coli*, *Bacteroides*, beta-hemolytic *Streptococci*, *Staphylococcus spp.*, and *Proteus spp.* are the most widely grown organisms, followed by *Fusobacterium* and *Clostridium perfringens* [13]. The key to treating these people with complicated disorders successfully is aggressive collaboration. The utilization of a multidisciplinary approach as an operating surgeon, with the skills of a urologist, a reconstructive surgeon, and a general surgeon, is crucial to the care. Our study aims to report our experience with the management of Fournier's gangrene.

## Patients and Methods

Between April 2018 and May 2022, researchers from department of General Surgery, Government General Hospital in Nizamabad conducted a prospective cross-sectional study of patients with FG. During the research period, all individuals diagnosed with FG and treated for it were included. Patients with missing or partial data were not included in the research. The diagnosis of FG

was designed depending on the patient's medical history and physical examination. Patients' information was obtained from patients admitted in the surgery ward. Age, gender, risk factors, etiology, clinical signs and symptoms, clinical parameters (heart rate, temperature, respiratory rate, and blood pressure), laboratory findings (serum sodium, potassium, creatinine, and bicarbonate, hematocrit and leukocyte count), and duration of symptoms prior to admission, as well as the number of surgical debridements, were all collected.

The FG severity index (FGSI) score was used to determine the severity of Fournier's gangrene at the time of admission [14, 15]. As recommended by omçal *et al.*, [16] and Eray *et al.*, [17], we estimated FGSI using clinical (temperature, heart and respiratory rate) and laboratory data (serum sodium, potassium, creatinine and bicarbonate, hematocrit and leukocyte count) acquired on admission. Each parameter is given 04 points, and FGSI is calculated by summing up the points of each parameter. The cut-off point is 9 so that when FGSI is >9, the probability of death is 75 %, and when it is <9, the probability of survival is 78 %. Patients were resuscitated where necessary with intravenous fluids, antibiotics (metronidazole, ceftriaxone and gentamicin), analgesics, and anti-tetanus prophylaxis, blood transfusions were also given.

### **Statistical data analysis**

SPSS computer program version 17.0 was used to analyze statistical data (SPSS, Inc., Chicago, IL, USA). For categorical variables, data were summarized using proportions and frequency tables. The median and ranges were used to summarise continuous variables. Univariate analysis utilizing the Chi-squared test and Fisher's exact probability test was used to investigate the relationship between prognostic (independent) factors and outcome variables (mortality and duration of hospital stay).

### **Results**

A total of 38 patients were seen during the study, with four patients being eliminated due to missing data, leaving 32 patients for the final analysis. With a male to female ratio of 15:1, there were 30 (93.75%) males and 2 (6.25%) females. Patients varied in age from 15 to 76 years old at the time of presentation, with a median of 34 years. The modal age group was 41-50 years old, which accounted for 14 (43.75%) of the cases (Figure 1).

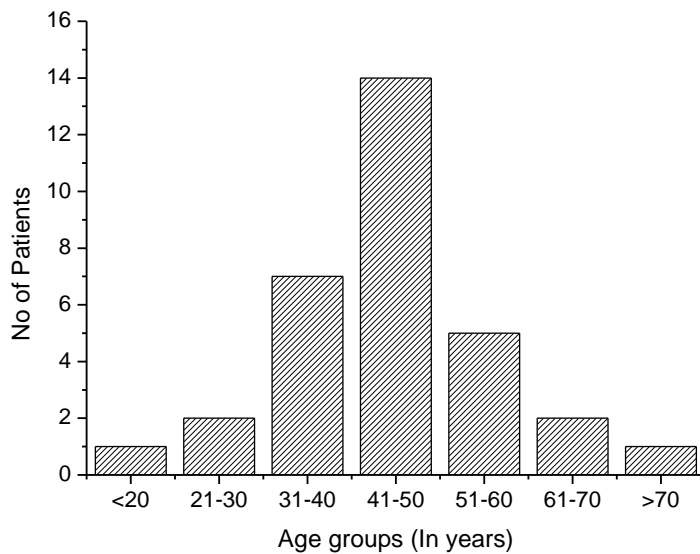


Figure 1. Distribution of patients according to the age group

One patient died (3.12 % mortality), but 31 patients (96.88 %) lived. The smallest hospital stay was three to five weeks, while the longest was 18 to twenty weeks (Figure 2).

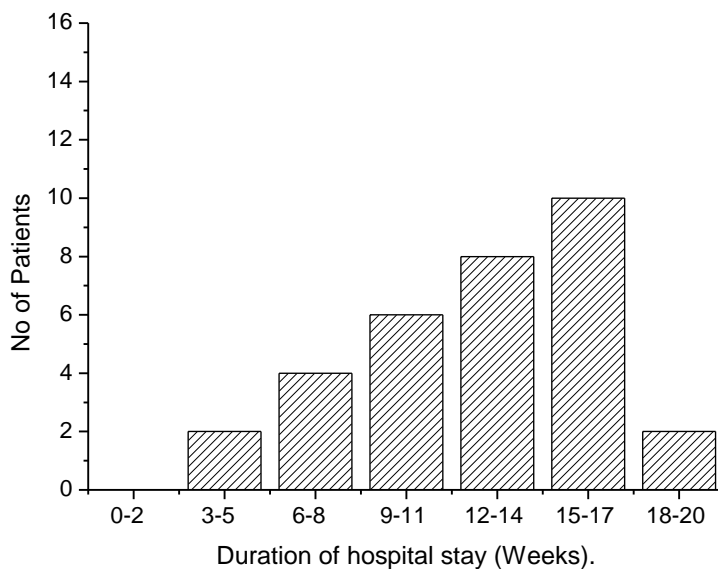


Figure 2. Duration of hospital stays (Weeks)

6 (18.72 %) patients had deranged serum E, U, and Cr (Electrolytes, Urea, and Creatinine), while 17 (53.12 %) patients had normal U, E, and Cr and 2 (6.25 %) patients did not have it done. 6 (18.75 %) patients had deranged serum E, U, and Cr (Electrolytes, Urea, and Creatinine), while 17 (53.12 %) patients had normal U, E, and 46.88% of the patients had urethral stricture with a watering can perineum as a predisposing factor, 11 (34.44%) had diabetes mellitus, 5 (15.62%) had perineal injuries as predisposing factors, 6 (18.72%) patients had uremia, and one patient (3.12%) each had bladder tumor and scrotal abscess as predisposing factors (Table 1).

Table 1  
Predisposing factors

Predisposing Factors	No. of Patients	Percentage (%)
Bladder Tumour	01	3.12
Diabetes Mellitus	11	34.44
Idiopathic	02	6.25
Perineal Injury	05	15.62
Scrotal Abscess	01	3.12
Urethral Stricture	15	46.88
Uraemia	06	18.72

The 32 patients were all given a course of broad-spectrum intravenous antibiotics, as well as repeated debridement and a sitz bath with hypertonic saline. Suprapubic cystostomy was used to redirect urine in 13 patients (40.62 %). Due to gangrenous testes, one patient (3.12 %) required orchidectomy. Only 18 (56.25 %) of the patients in this study had positive aerobic bacterial culture findings. Polymicrobial bacterial growth was found in 14 (77.77%) of the samples, whereas monomicrobial bacterial growth was found in 4 (22.23%). The most common bacterial species identified were *Escherichia coli* (27.77%) and *Staphylococcus aureus* (11.11%). (Table 2). Due to a lack of facilities, anaerobic cultures were not performed. Antibacterial susceptibility testing revealed that almost all pathogen isolates had multiple resistance to almost all antibiotics tested (such as ampicillin, augmentin, cotrimoxazole, tetracycline, penicillin, and gentamicin, erythromycin, oxacillin, and so on), except Meropenem and imipenem, which were both 100 % perfect sensitive.

Table 2  
Distribution of patients according to the type of micro-organisms isolated

Micro-organisms Isolated	Frequency	Percentage
<i>Escherichia Coli</i>	5	27.77
<i>Staphylococcus aureus</i>	2	11.11
<i>Klebsiella pneumonia</i>	3	16.66
<i>B-hemolytic streptococcus</i>	4	22.22
<i>Acinetobacter spp</i>	2	11.11
<i>Pseudomonas aeruginosa</i>	1	5.55
<i>Proteus Vulgaris</i>	0	-
<i>Other rare spp</i>	1	5.55

## Discussion

FG, which was once thought to be uncommon and idiopathic, affecting exclusively men, is gradually shifting its pattern. The male preponderance in this study is consistent with earlier findings published in other investigations [18-20]. We couldn't figure out why this gender distribution exists [20]. The median age of patients in this study was 34 years old at the time of presentation. We were unable to determine the cause of the age disparity. One patient died (3.12 %t mortality), but 31 patients (96.88 %) lived. The lowest hospital stay was three to five weeks, while the longest was 18 to 20 weeks [21]. Patients with urethral stricture with a watering can perineum as a predisposing factor, 11 patients with diabetes mellitus, 15 patients with perineal injuries, and two patients with idiopathic symptoms were discovered by taken *et al.*, [22] and Murthy *et al.*, [23]. Resuscitation, broad-spectrum intravenous antibiotics, and aggressive debridement are the mainstays of therapy for Fournier's gangrene [24, 25], and the same principles were followed in our center. In addition to the foregoing, some centers around the world employ hyperbaric oxygen [26, 27], but we do not have such a facility at our center, therefore after the first debridement, all of the patients had twice daily hypertonic saline sitz baths, which had a very favorable reaction.

The 32 patients were all given a course of broad-spectrum intravenous antibiotics, as well as repeated debridement and a sitz bath with hypertonic saline. Suprapubic cystostomy was used to redirect urine in 13 individuals. Due to gangrenous testes, one patient had orchidectomy. Because the testicles have a different blood supply than the rest of the body, they are rarely involved in the gangrene process [28, 29]. In our study, only one patient had orchidectomy due to gangrenous testis; this was one of the patients who had a scrotal abscess, most likely due to an infected hydrocele. Only 18 patients in this investigation had positive aerobic bacterial culture findings. There was polymicrobial bacterial growth in 14 of them, and monomicrobial bacterial growth in four of them [20, 30]. Our study's mortality rate was 3.12%, which is consistent with data from other locations [20, 31].

## Conclusion

The pattern of Fournier's gangrene, a quickly progressing, fulminant polymicrobial synergistic infection of the perineum and genitals, is shifting. Early detection of infection, as well as invasive and vigorous treatment, is critical in reducing these prognostic variables. Antibiotic susceptibility testing remains of paramount importance in the management of this condition.

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