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A Prospective Study of Fourniers Gangrenes' Natural History

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Abstract:
Background: *Fournier's gangrene is a rare, rapidly progressive, necrotizing fasciitis of the external genitalia and perineum. Case series have shown a mortality rate of 20% to 40% with an incidence of as high as 88% in some reports. In this study we aimed to share our experience in the management of Fournier's gangrene and to identify risk factors that affect mortality.*
Methods: *Prospective study of 15 patients. Risk factors,microbiological finding, lab investigations, treatment and outcome are analysed*
Results: *Finally for all the patients underwent debridement of necrotic tissues.. secondary suturing was done in 60% cases, SSG applied in 20% cases, rest of the cases wound closed spontaneously.*
Conclusion: *Fournier's gangrene is still a very severe disease with high mortality rates. Early recognition of infection associated with invasive and aggressive treatment is essential for attempting to reduce these prognostic indices*
Keywords: *fournieres gangrene , mortality, complication, scrotum*

I. Introduction

Fournier's gangrene (FG) is a rare, rapidly progressive, fulminant form of necrotizing fasciitis of the genital, perianal and perineal regions, which may extend up to the abdominal wall between the fascial planes . It is secondary to polymicrobial infection by aerobic and anaerobic bacteria with a synergistic action. The cause of infection is identifiable in 95% of cases, mainly arising from anorectal, genito-urinary and cutaneous sources. Predisposing factors such as diabetes and Immunosuppression lead to vascular disease and suppressed immunity that increase susceptibility to polymicrobial Infection.[1][2][3] Diagnosis is based on clinical signs and physical examination. Radiological methods may help to delineate the extent of the disease but false negatives may happen. Dissemination of the disease was found to be a major determinant of patients' outcomes in previous reports . It may reflect the aggressiveness of the involved infectious agents or reflects the degree of patients' immunosuppression. Several reports tried to evaluate the usefulness of diverse scoring systems. Fournier's Gangrene Severity Index (FGSI) has become a standard for researchers, being routinely published in FG literature and is considered as a good predicting tool . The mortality rate for FG is still high, at 20–50% in most contemporary series .[5][6] Fortunately, it is a rare condition, with a reported incidence of 1.6/100,000 males with peak incidence in the 5th and 6th decades. However, the incidence is rising, most likely due to an increase in the mean age of the population, as well as increased numbers of patients on immunosuppressive therapy or suffering from human immunodeficiency virus (HIV) infection, especially in Africa. Early diagnosis, aggressive resuscitation of the patient, administration of broad-spectrum antibiotics and aggressive radical surgical debridement(s), are the key of successful treatment. In this study, we aimed to investigate patients with FG and to identify risk factors that affect mortality.[8][9][10]

II. Materials And Method

In this prospective study 15 cases of fourniers gangrene admitted in chengalpattu medical college hospital during the period of august 2013 to august 2014. All cases were thouroughly studied routiene investigations done for all patients. Risk factors, microbiological finding, lab investigations, treatment and outcome are analysed.How risk factors influence the final outcome of the disease was analysed. This is useful for the management further and to asses the prognosis of the disease in future.

III. Review Of Literature

Fourniers gangrenewas first described by baurienne in 1764 and is named after a french venereologist, jean alfred fournier following five cases he presented in clinical lectures in 1883. An estimated 750 cases have been reported in the literature,with most people in their 60s or 70s with other illnesses. According to another study in 2000, there have been at least 1726 reported cases in the English literature However, Fournier gangrene is not a reportable illness, so the number of unreported cases is unclear. A similar infection in women has been occasionally described.[11][12][13]

In Turkey it was reported that 46% of patients had diabetes mellitus while other studies have identified approximately a third of patients having either diabetes, alcoholism or malnutrition, and 10% having medical immunosuppression (chemotherapy, steroids, or malignancy).

IV. Results

The mean age of presentation is 54.6 years(39-73), presented 3.67(1-7)days after onset of symptoms, associated with perineal infections in 33%, genitourinary infections in 20%, with diabetes in 40% and CKD in 20% ,associated with E.COLI infection in 27% cases. All the patients underwent debridement of necrotic tissues.. secondary suturing was done in 60% cases, SSG applied in 20% cases, rest of the cases wound closed spontaneously.

V. Discussion

Fournier's gangrene, caused by synergistic aerobic and anaerobic organisms, is a life-threatening disorder in which infection of the perineum and scrotum spreads along fascial planes, leading to soft-tissue necrosis. This infectious was initially described by Baurienne in 1764. Before in 1883 Jean Alfred Fournier, French dermatologist described a syndrome of unexplained sudden onset and rapidly progressing gangrene in the penis and scrotum of 5 young men with no other pathology basis of sudden onset and rapid progression.[14][15][16] In its early reports Fournier's gangrene was described as an idiopathic entity, but in most cases a perianal infection, urinary tract and local trauma or skin condition at that level can be identified. The mortality rate for FG is still high, (20–50%) in most contemporary series, despite an increased knowledge of the etiology, diagnosis and treatment, and intensive-care techniques.[17][18] The high mortality reflects both the aggressive nature of the infection and the destructive effects of accompanying predisposing factors. Several factors affecting the mortality were studied such as increasing age, primary anorectal infections, existence of diabetes, delay in treatment, evidence of systemic sepsis at presentation, extent and depth of involvement, a low haematocrit, a high leukocytosis and blood urea nitrogen, a high alkaline phosphatase and serum albumin, and many others.[18][19][20] These and other studied variables that influence the outcome of patients with FG, in large part, remains controversial. In this purpose, the FGSI was developed to help clinicians predict the outcome of patients with FG and remains an objective and simple method to quantify the extent of metabolic aberration at presentation in patients with FG. It has been validated in several reported studies.[21][22][23] The average age of the patients was 47.5 years, in most published series from 40.9 to 61.7 years. In a population based study of 1641 patients, Sorensen *et al.* found that an increasing patient age was the strongest independent predictor of mortality (aOR 4.0 to 15.0, $p < 0.0001$) . Our results are in keeping with the study of Sorensen et al. as the survivors were significantly younger than the non-survivors in our series. With regard to gender, the male predominance is reported in 96%, so the female was present only in 4%. Czymek *et al.*, compared mortality between male and female in a series of 38 patients (26 M vs 12 F). Authors found that mortality is significantly higher among female (50% F vs 7.7% M, $p = 0.0011$). We could not confirm this result, as female gender did not appear as predictor factor of mortality in our study.[24][25][26] Numerous factors have been implicated at the onset of FG, in particular, those involving the immune system. Diabetes mellitus was the most reported co-morbid disease associated with this pathology. Some authors estimate the prevalence of DM among FG patients between 50 and 70 percent. Despite of being a risk factor for FG and associated with a more progressive and fatal outcome (decreased phagocytic and intracellular bactericidal activity and neutrophil dysfunction), most reported studies along with our have failed to demonstrate the influence of DM on outcomes in FG.

It is also suggested that renal failure on admission might be a noticeable factor for the prediction of the mortality rate. Among many laboratory parameters studied in FG, Clayton *et al.*, reported that only a level of blood urea >0.5 g/l on admission was statistically significant for mortality. In our study we also found that renal failure on admission is significantly higher in non survivors. Few articles have highlighted the poor prognosis of FG in patients with a delay between time of presentation and treatment. This factor has been reported in a study by Jeong *et al.*, as a predictor of mortality.[27][28][29][30] Along with other studies, we did not find delay this to be a major predictor of mortality. The extension of the disease and the mortality rate are controversial themes in the literature.[31][32] Some studies have reported that the spread of the disease is related to a higher death rate, while other studies report that the extension of the gangrene does not relate to a poorer prognosis.[33][34] In this field, extent to abdominal wall (Figure 1) has been reported to be directly related to mortality, which was confirmed in our series.[35][36] Ultimately, occurrence of septic shock and need for postoperative mechanical ventilation, have been demonstrated as a powerful (even late) factors of mortality.[37] Furthermore, Yanar *et al.* found that the presence of sepsis was as the only significant independent risk factor for mortality in FG.

Lrinec Score: Crp, Wbc count ,Hb, Na, creatinine, glucose

VI. Conclusion

Fourniers gangrene is rapidly progressive necrotizing infection involving genitals and perineum. Delayed presentation and associated comorbid illness diabetes and CKD and sepsis at the time of presentation influences prognosis. Early aggressive debridement and broad spectrum antibiotics are the main stay of treatment.

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NAME	age	Ipno	days	perianal	UTI	OTHERS	DM	OTHERS	HB	TC	RFT	ORG	DEBRIDE	ORCHIDE	OUTCOME
RAMAN	50	749	2 DAYS						11.2	7200	32,0.8				SECSUTURING
CHELLAPPAN	53	3492	1 DAY	YES			YES		8.4	13,800	64,2.0	KLEBSIE			SECSUTURING
MUTHU	39	4262	5 DAYS	YES			YES		7.6	15,200	70,2.3	E.COLI, PROTEUS			SECSUTURING
SELVAM	67	4695	5 DAYS					CKD	8.2	8400	72, 2.1	,E.COLI, PROVIDENCIA			SECSUTURING
KUMAR	60	5859	7 DAYS				YES		11.8	10400	31.0.8				SSG
BABU	43	6263	4DAYS	YES					14.4	5400	24,0.6				SSG
SIVALING	73	7224	7 DAYS				YES	CKD	10.4	9000	35,1.2				SECSUTURING
RAMACHAND	70	7856	2 DAYS		YES		YES	SHT	8.4	9800	76, 2.3				SECSUTURING
SEKAR	50	25665	3 DAYS	YES					11.6	9600	36, 1.2	E.COLI			SSG
KAMALAK	40	5331	3 DAYS						12.6	8200	24,0.6				
KRISHNAN	60	24833	5 DAYS		YES		YES		10.4	14,200	52,1.6				
KANNAN	50	13461	1 DAY						9.6	9400	24,0.6				SECSUTURING
KUPPAN	70	43526	4 DAYS		YES			SHT, CKD	8.4	7400	66,1.8				SECSUTURING
MURUGAN	39	12614	2 DAYS						9	10800	56,1.6	E.COLI		YES	SECHEALING
MANI	55	38151	4 DAYS	TES					13.6	9100	20,0.6				SECSUTURING