

Comparison of Mortality Incidence Between Fgsi Score and Procalcitonin Level in Fournier's Gangrene in Tertiary Hospital

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Abstract--*Fournier's gangrene was defined as a high mortality rate disease which most of the cases detected in late phase resulting on poor prognosis. Several method promoted to predict mortality such as Fournier's Gangrene Severity Index (FGSI) score and study of procalcitonin level. We compare the mortality incidence using both methods. The 32 cases collected from medical record and divided into survivor and non survivor group. Retrospectively evaluated the procalcitonin level and score of FGSI each group and analyzed using cross sectional comparison. Total of 32 cases collected from medical record database, starting January 2012 until December 2016. All cases was presented in male patients ranging from 18 - 82 years old (mean 51,10 $SD \pm 15,1$). Identified score of $FGSI \geq 9$ was 59,45% (19 cases), and identified high level of procalcitonin was 99,97% (31 cases). Mortality incidence was 62,5% from all cases, which all the non survivor showing high level of procalcitonin and 80% (16 cases) showing score of $FGSI \geq 9$. In other hand, patients with high level of procalcitonin has 64,52% mortality incidence (20 cases) while patients with score of $FGSI \geq 9$ has 84,21% mortality incidence (16 cases). From survivor group 8,33 % (1 cases) showing normal level of procalcitonin and 75% (9 cases) showing score of $FGSI < 9$. Fournier's gangrene are most common in male patients with high mortality rate. Procalcitonin level study and FGSI score evaluation are both able to predict the mortality. Procalcitonin showing higher sensitivity while FGSI more specific in prediction.*

Key words--*Fournier's Gangrene, FGSI, Procalcitonin*

I. INTRODUCTION

Fournier's Gangrene (FG) is a fulminant infection, including necrotising fasciitis of the genital, perineal and/or perianal regions. It was initially described by Baurinne in 1764 and is named after Jean Alfred Fournier, a French dermatologist who in 1883 described it.

This condition is potentially fatal, affects any age and gender, has been reported even in neonates, is characterized by rapid progression of infection in soft tissue, caused by the synergistic action of several agencies that extend along fascial planes, causing necrosis of these tissues and destruction.

This necrosis is secondary to thrombosis of small vessels, which is due to endarteritis obliterans caused by the spread of microorganisms into the subcutaneous space (platelet aggregation stimulated by heparinase produced by aerobic and anaerobic bacteria), which in addition to generating local oedema, hypoxia, difficulty in local blood supply, favours the development of anaerobic bacteria. These microorganisms produce hydrogen and nitrogen that accumulate in tissues, causing crepitation.

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The most frequent concomitant diseases are diabetes mellitus (DM; present between 32% and 66% of cases), alcoholism and cancer, among other immunosuppressive diseases. Mortality has been reported in different series to range from 16 to 40%.

FGSI is a numerical score obtained from a combination of physiological hospital admission parameters that include temperature, heart rate, respiration rate, sodium, potassium, creatinine, leukocytes, haematocrit and bicarbonate. They stabilised that an FGSI score above 9 is sensitive and specific as a mortality predictor in FG patients.

Procalcitonin, consisting of 116 amino acids, is one of the precursor proteins of calcitonin, although its biological role is unknown. When there is a bacterial infection, CALC1 gene expression is increased, and the expression of the precursor of calcitonin, procalcitonin, is subsequently increased in all of the cells in the body. Synthesis of procalcitonin is stimulated by bacterial endotoxins and the proinflammatory cytokines, interleukin (IL)-1 β , IL-6 and TNF, and suppressed by the interferon- γ secreted during viral infection.

White blood cell (WBC) count, erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP) are often used as markers of bacterial infection severity. However, in some cases, there are difficulties in using these markers as indicators of diagnosis and treatment due to their low sensitivity and specificity. A recent study reported the value of procalcitonin in bullous impetigo, staphylococcal scaled skin syndrome, localized skin infection, diabetic foot infection, septic arthritis and osteomyelitis. In addition, procalcitonin may be a useful tool for the initial diagnosis and monitoring of cutaneous infection or cutaneous soft tissue infection.

II. MATERIAL AND METHOD

32 cases collected from medical record and divided into survivor and non survivor group. Retrospectively evaluated the procalcitonin level and score of FGSI each group and analyzed using cross sectional comparison.

III. RESULTS

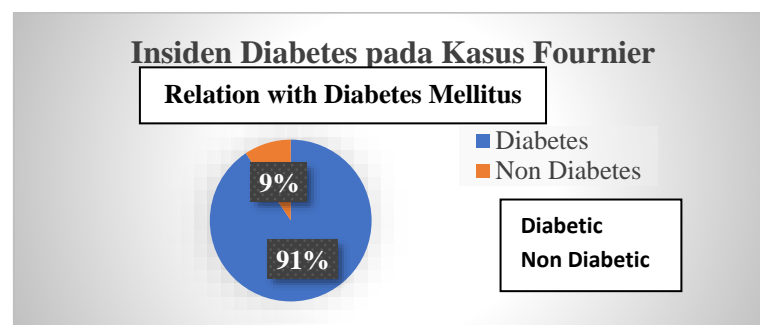
Four years data collection from January 2012-December 2016 showing the mean age 51,10 SD \pm 15,1. The youngest case presented in 18 years old patient and the oldest in 82 years old. We classified the data into two groups based on the FGSI score. The group of FGSI score <9 40,6% (13 cases) and FGSI \geq 9 59,45 (19 cases). These data is also classified based on procalcitonin level, normal level in 1 case, and the rests are above normal.

Tabel 1. Characteristic Fournier's gangrene cases in dr. Saiful Anwar Malang Hospital January 2012 – December 2017.

	Value	%
Total case	32	100
Mean age	51,10 SD \pm 15,5 (range 18 – 82)	100
FGSI score		
FGSI < 9	13	40,62
FGSI \geq 9	19	59,38

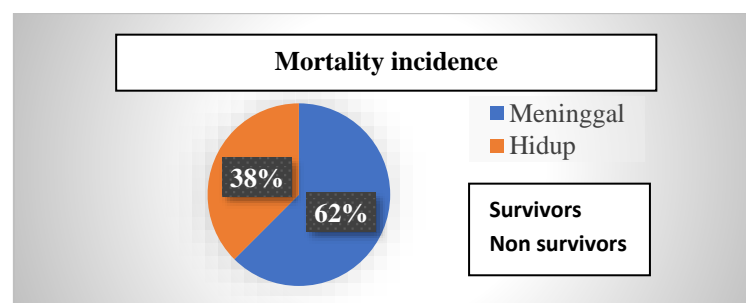
Procalcitonin			
	Normal	1	0,03
	Above normal	31	99,97
Diabetes Mellitus related			
	Diabetic	29	99,91
	Non Diabetic	3	0,09
Mortality			
	Non survivor	20	59,7
	Survivor	12	40,3
Definitive treatment			
	Primary Closure	10	61,1
	Medial Femoral Flap	2	38,9

Condition of the patient weakend by the underlying disease prior to presentation of Faournier's gangrene. Diabetes Mellitus in one of which believed to worse the general manifestation of the disease. Total 9% (3 cases) are non diabetic related, while 91% (29 cases) are diabetic related which acquired before the Fourniere's gangrene.

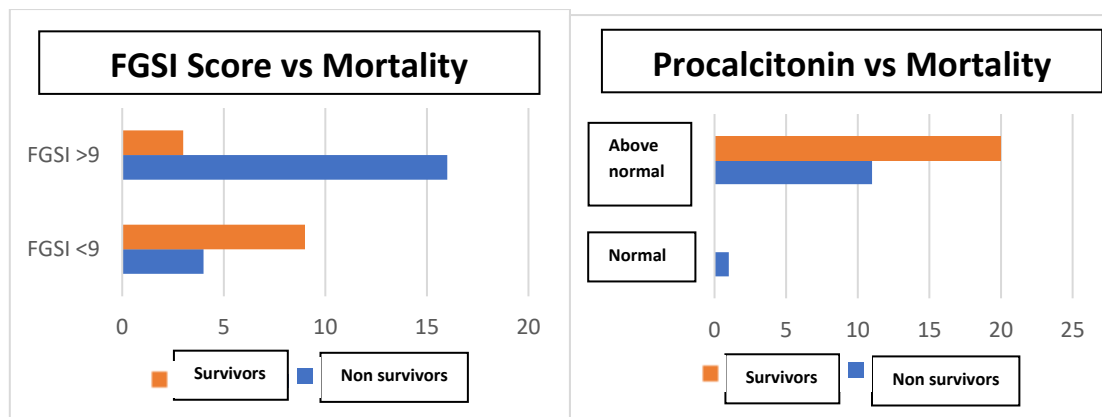


Picture 1. Relation with diabetes mellitus

Mortality incidence was 62% (20 cases). In details the mortality in FGSI score <9 and FGSI score ≥ 9 group are 30,76% and 84,21 % respectively. Using the procalcitonin level study, the mortality was 64,52% from all patients with increasing value. Patient with normal level of procalcitonin was survived.



Picture 2 . Mortality incidence



Picture 3. Mortality incidence in FGSi score and Procalcitonin level grouping

IV. CONCLUSION

Fournier's gangrene are most common in male patients with high mortality rate. Procalcitonin level study and FGSi score evaluation are both able to predict the mortality. Procalcitonin showing higher sensitivity while FGSi more specific in prediction.

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