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A Study of Incidence of Necrotizing Fasciitis During the Covid- 19 Pandemic in A Tertiary Care Center in Kanchipuram

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Abstract

Government of India implemented a lockdown on 24thMarch2020 to prevent the spread of COVID-19 virus. This lockdown had prevented deaths due to COVID- 19, but has its impacts on diabetic population The study demonstrates one such effect – Delayed presentation of diabetic wounds as Necrotizing Fasciitis Necrotising Fasciitis is a severe spreading infection of skin and soft tissue with a rapid progression; Our study was carried out in a Tertiary care center, in the department of Plastic surgery by collecting data for a total period of 18 months- August 2019 to November 2020; 9 months before and after implementation of lockown during the first wave of COVID-19. We have analysed them and arrived at the incidence of Necrotising fasciitis during the pandemic period. The goal of our study is to emphasize the importance of emergency services to non-Covid 19 patients

Keywords: Lockdown, Corona Virus, Necrotizing Fasciitis, Pandemic

INTRODUCTION

The novel corona virus has created havoc across the world; Government of India implemented a lockdown on 24th March 2020 for preventing the spread of novel corona virus, as it was the only way to curb the spread until a vaccine arrived for the same.

Although there is no doubt that this had prevented deaths due to covid 19, it has its impacts on causing late presentations of common complications of diabetes like diabetic foot ulcers, cellulitis, callosities which has paved way for Necrotising Fasciitis.

Our study was performed to show one such effect and create awareness about it to prevent such late presentations during the second wave of this Pandemic;

We have carefully analysed data from the first wave of Covid – 19 Pandemic period from March 24th for a period of 9 months, and compared it to similar period before the Pandemic and arrived at the difference in the prevalence of necrotising fasciitis among diabetics during the covid 19 pandemic;

NECROTIZING FASCIITIS:

It is a rapidly spreading invasive infection affecting the Skin and soft tissues including the deep fascia

It spreads along the fascial planes in a suprafascial manner

It has a relative sparing of muscles

RISK FACTORS:

Diabetes

Malnourishment

Obesity

Steroids

Immuno compromised state

Peripheral vascular disease

Chronic illness

Underlying malignancy

Renal failure

Immune suppressive drugs- eg cyclosporine, tacrolimus etc

Intra venous drug misuse

Route of bacterial entry:

There is mostly a history of minor/ major trauma which is followed by wound contamination

Skin abrasion

Insect bites

Surgery

Intra venous drug abuse

Hypodermic therapeutic injections

SITES:

It commonly occurs in the lower extremities and other sites include genitalia, groin and lower abdomen

BACTERIOLOGY

It is mostly caused by Group A Beta hemolytic Streptococci, and other polymicrobial infections which includes:

Gram-positive aerobes like Staphylococcus aureus, Streptococcus pyogenes)

Gram-negative anaerobes like Escherichia coli, Pseudomonas, Clostridium and Bacteroides

CLASSIFICATION:

TYPE 1: Polymicrobial

Up to 4 or 5 aerobic and anaerobic specie will be cultured;

They are most common and contribute upto 80 – 90 % of the necrotizing Fasciitis infections

Commonly seen in diabetics and other immune compromised patients

TYPE 2: Monomicrobial

Most common cause is the Group A Beta Hemolytic Streptococci

It contributes to 5 % of Necrotising Fasciitis infections

It occurs in Healthy individuals

Extremities are commonly affected

TYPE 3 : Marine vibrio vulnificus- the gram negative rods

This occurs after a marine exposure like estuaries, brackish ponds, or coastal areas

Found in warm seawater and in shellfish and crustaceans

TYPE 4: MRSA

CLINICAL PRESENTATION:

Patients with necrotising fasciitis present with the following symptoms:

Signs of skin inflammation: Pain, Erythema, skin oedema

Patchy skin discoloration without a well-defined margin

Constitutional symptoms due to sepsis: Fever, Tachycardia, altered mental status

High degree fever rapidly progresses to systemic complications if untreated

There is Pain out of proportion to the degree of skin inflammation

Clinically the affected part is red, erythematous, with ulcerations, skin necrosis with skip lesions and brawny induration;

WORKUP:

Blood Laboratory investigations

Cultures- Microbiological investigations

Radiological investigations of the affected limb

LABORATORY RISK INDICATOR FOR NECROTISING FASCIITIS - (LRINEC) SCORE:

The Laboratory Risk Indicator for Necrotising Fasciitis (LRINEC) score first published in 2004

It is based on routinely performed investigations

Helps in identifying early cases.

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PARAMETER	RANGE	SCORE
Hb (g/dl)	> 13.5	0
	11 – 13.5	1
	< 11	2
White blood cells (10^9 / L)	< 15	0
	15 – 25	1
	> 25	2
Sodium (mmol / L)	< 135	2
Creatinine (µmol / L)	> 141	2
Glucose	> 10	1
C reactive protein	> 150	4

INTERPRETATION:

Score of ≤ 5 = < 50 % risk (low) ;

Score of 6 – 7 = intermediate risk;

Score of ≥ 8 = > 75 % risk (high) ;

This scoring has the potential to markedly prevent morbidity and mortality by helping in the accurate diagnosis of necrotising fasciitis

CULTURES:

Blood cultures and intraoperative tissue cultures

IMAGING TECHNIQUES:

The common radiological investigation, plain x ray findings are usually non specific

There will be an increased soft tissue thickness and opacity

In a minority of cases , there will be evidence of gas in the soft tissue

TREATMENT:

Antibiotics

Operative treatment

ANTIBIOTICS:

INITIAL ANTIBIOTICS:

Start empirically with intravenous penicillin, clindamycin, metronidazole, or an aminoglycoside

DEFINITIVE ANTIBIOTICS

Penicillin G for Streptococcus or clostridium

Imipenem or doripenem or meropenem for polymicrobial

Add vancomycin or daptomycin if MRSA is being suspected

POLY MICROBIAL INFECTIONS:

Preferred treatment is Piperacillin or Tazobactam 4.5 g Intra venously Q 8 Th hourly

Alternative drug is Cefotaxime 2 g Intra venously Q 8 Th hourly

Along with metronidazole 500 mg Intravenously Q 8 Th hourly (or) Ampicillin or Sulbactam 1.5 mg intravenously Q 8 th hourly

Along with Clindamycin 600 - 900 mg Intravenously Q 8 th hourly

Add 1 g Q 12 th Hourly of Vancomycin if there is a high risk for MRSA- Methicillin resistant Staphylo Coccus Aureus species;

For Group A Beta Hemolytic Streptococci, add Injection Benzyl Peniciilin 2- 4 MIU, Q 4 th hourly

Along with Injection Clindamycin 600- 900 mg Intravenously Q 8 th hourly;

Manage the septicemia according to the ICU guidelines

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OPERATIVE MANAGEMENT:

Emergency surgical radical debridement

The operative findings will include:

Liquefied subcutaneous fat

Dishwater pus

Necrosis of muscle

Venous thrombosis

Muscle will not be contracting

A positive "probe test" result, it is characterized by the lack of resistance to finger dissection in normally adherent tissues

AIM:

To estimate the incidence of Necrotizing Fasciitis in the covid 19 Pandemic era

Objective:

To estimate the difference in the incidence of frequency and severity of Necrotizing fasciitis in patients attending Plastic surgery OPD / Emergency room;

To identify the patient and physician factors responsible for its incidence

To create awareness about prevention of such complications and seeking immediate medical help

METHOD OF STUDY:

We collected data from hospital registers, patient's case records;

We compared the incidence of necrotizing fasciitis in the covid era and similar duration before covid – 19;

MATERIALS AND METHODS

Study type – Retrospective

Study design – Cross Sectional Observational study

Study setting – Chettinad Super Speciality hospital- Department of Plastic surgery

Sampling technique- non probability convenient sampling

Duration of study- 18 months from August 2019 to November 2020

Sample size calculation: sample size is calculated using the formula ***4 * P * Q / d2***

Where P is prevalence

Q is 100 - P

D - variation- 20%

Since there are no similar studies in our setting, assuming Prevalence (p) as 50, d as 20

4 x 50 x 50 / 20 x 20 = 25

Our study sample size is 74;

INCLUSION CRITERIA:

All cases of necrotising fasciitis, chronic ulcers, diabetic foot;

EXCLUSION CRITERIA:

Post traumatic skin degloving and Morel lavallee lesions resulting in skin and tissue necrosis

TOOLS USED FOR ASSESMENT:

We collected data and entered it in the Microsoft excel spread sheet

STATISTICAL ANALYSIS:

We analysed the collected data using Statistical Package for Social Sciences (IBM – SPSS)

We assessed the Normality of data before applying the appropriate tests of significance

Significance of the difference in proportions (qualitative variables) was calculated using chi square test

We described Quantitative variables as mean and standard deviation

We described quantitative variables in proportions

Significance of p value → $p < 0.05$

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Images of patients who presented with Necrotizing Fasciitis during the first wave of the COVID - 19 Pandemic

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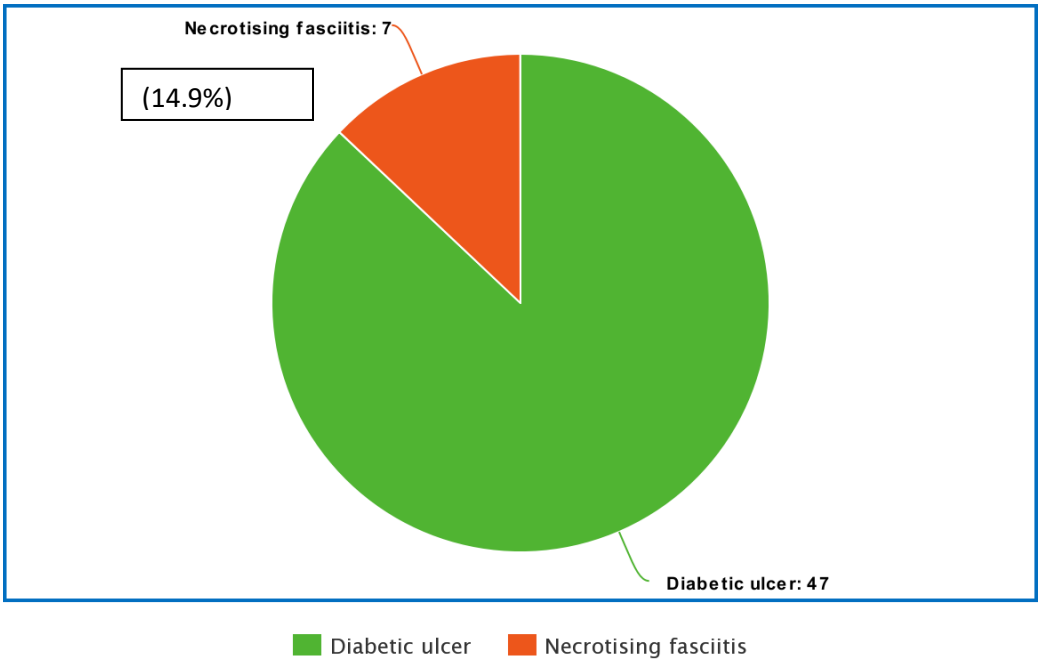
RESULTS

Analyzing our data, the incidence of necrotizing fasciitis was 14.9% in the covid period ; 7 out of 47 diabetic ulcers became necrotizing fasciitis;

INCIDENCE OF NECROTIZING FASCIITIS DURING THE COVID PANDEMIC



11.1% had Necrotizing fasciitis in the pre covid period; 3 out of our 27 diabetic ulcers turned to necrotizing fasciitis;

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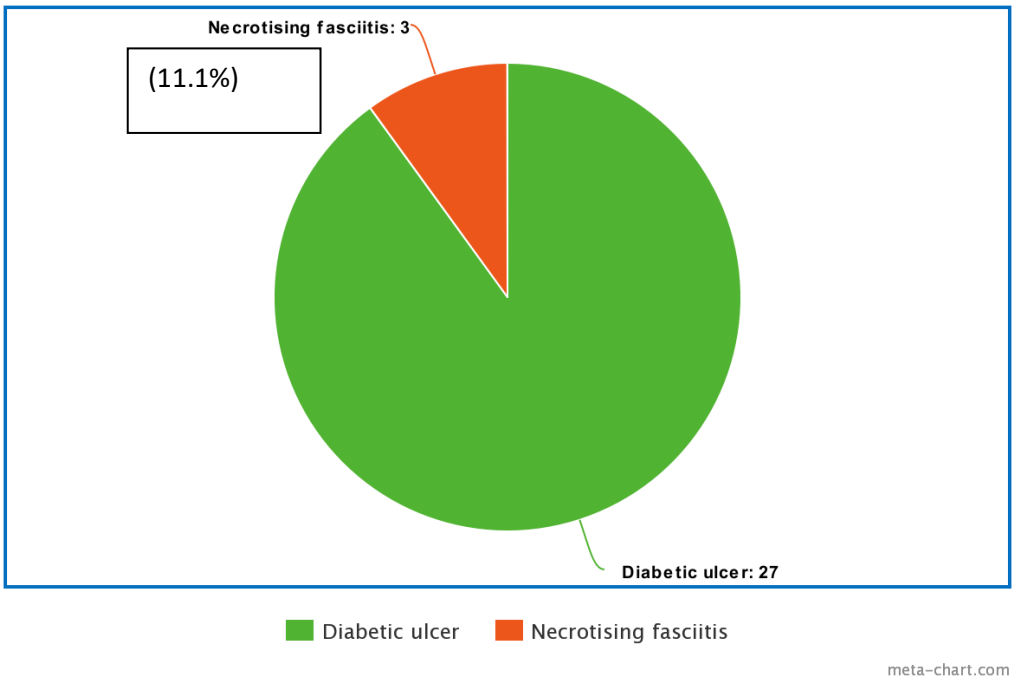
INCIDENCE OF NECROTIZING FASCIITIS DURING THE PRE COVID-PERIOD



This is a 3.8 % increase of necrostizing fasciitis in the covid period ;

CONCLUSION

Our study highlights the importance of early presentation to the hospital by diabetic patients as even a trivial lesion could progress to Necrotizing fasciitis;

Diabetic ulcers are manageable when presented early to the hospital, avoiding the progress to life threatening Necrotizing fasciitis;

This study can serve as a basis to strengthen Tele communication and bring the susceptible population early to the hospital;

Since health authorities are warning about the possible 3 rd wave of COVID, it is crucial to avoid such critical conditions by early prevention

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