

## Prevalence of Lower Limb Cellulitis in Non-Diabetic Patients

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### Abstract :

**Background:** Cellulitis is more commonly seen in lower limbs as they are more susceptible to injuries. This study analyzes the prevalence, causes and risk factors for cellulitis in non – diabetics

**Methods:** This study was conducted at hospitals in Pondicherry and included 100 non – diabetic patients with cellulitis. The severity of cellulitis was graded as per CREST guidelines. Demographics, risk factors, grades, management and treatment outcomes were recorded and analyzed.

**Results:** Prevalence of cellulitis was more common in females (58%) and old age group (37%). It is more unilateral (86%) and resulted from post bite wounds (21%). Patients with severe grades of cellulitis needed surgical intervention and many patients needed skin grafting.

**Conclusions:** The prevalence of lower limb cellulitis in non- diabetics was found to be more in females and in elderly groups. Patients who are not diabetic presenting with lower limb cellulitis can result in severe morbid consequences but in the absence of co- morbid illness, they usually recover with mild residual disabilities.

**Keywords -** Cellulitis, CREST guidelines, Lower limb, Non-diabetic

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### I. Introduction:

Cellulitis is a condition which is characterized by inflammation of the connective tissue of the skin with severe involvement of dermal and subcutaneous layers.<sup>[1]</sup> It is mainly due to a bacterial infection, the organism can be either the normal skin flora or an exogenous one.<sup>[2]</sup> It involves mostly the skin which is more prone to the breaks, cracks, blisters, ulcerations, cuts, bite wounds or hospital-related injuries like surgical wounds or the intravenous cannulae .<sup>[3]</sup> Lower limbs are the most commonly involved sites as the skin over there is more susceptible to the injuries mentioned.<sup>[4]</sup>

As commonly known, diabetics are the most susceptible population for the lower limb cellulitis primarily because of the fact they have more incidence of foot ulcers (due to the neuropathy and vasculopathy which leads to sensory loss and poor distal circulation) and also because of their immunocompromised status.<sup>[5]</sup> Poor glycemic control aids the growth of organisms in the ulcers which develop and eventually results up in cellulitis.

Yet, there is a significant section of the population who are non-diabetics and also more prone to the development of lower limb cellulitis and its complications. <sup>[6]</sup> This group is gaining attention now as the number of patients affected shows an increasing trend. The management of this group differs from that of diabetics in such a way that effect of altered body metabolism, glycemic control, and sensory compromise is negotiated.<sup>[7]</sup> Early cellulitis in the Non-diabetics can be managed in out-patient unit with oral antibiotics,

analgesics and treating the primary cause. But cellulitis of higher grades, with its complications like blisters, myositis, and fasciitis needs hospital admission, parenteral antibiotics, and surgical management.

## **II. Methods:**

This study includes 100 non-diabetic patients, who got admitted for lower limb cellulitis and its complications, at hospitals in Pondicherry. The study was conducted in January 2018.

Patients who had completed 18 years and those willing to give informed consent were included in the study. Patient demographics and general condition were recorded in the preformed questionnaire.

The severity of limb involvement in cellulitis was graded as per the CREST guidelines.

Class I patients will not have signs of systemic toxicity or any co morbidities and are routinely treated with oral antibiotics in the medical or surgical outpatient departments.

Class II patients either have a systemic illness, in the form of fever due to the infective focus or have some co-morbidity like a Peripheral vascular disease, chronic venous insufficiency or morbid obesity which can affect the resolution of infection.

Class III patients have either severe systemic problems or limb-threatening infections due to vascular compromise and the patient presents with edema, blistering and devitalizing changes in the site or with unstable co - morbidities.

Class IV patients include those with severe life-threatening infections like necrotizing fasciitis or cellulitis associated with sepsis syndrome. Cellulitis occurring in the immunocompromised individuals is also included under this category.

## **III. STATISTICAL ANALYSIS:**

Results were computed and analyzed with SPSS software version 17.

## **IV. Results:**

Post-bite cellulitis was responsible for most cases of cellulitis in the study group 21% (n = 21), followed by traumatic ulcers which were infected and web space infections (17%) (n = 17).

It was also noted that as the age increases, the severity of cellulitis (grade III and IV) increased. It was (n = 8/14) in 21-30 age group (58%) and (n = 31/37) in 51-60 age group (84%). Cellulitis was more severe in females with 81% (n = 47/58) presenting with grade III or IV cellulitis.

Post-bite cellulitis was more common in females (n = 15/58) (25%) followed by web space infections (n = 10/58) (16%). In males, trauma was the most common cause (n = 11/42) (27%) followed by web space infections and chronic kidney disease (n = 7/42) (17%).

It was observed that 76% of the patients in the study group required surgical debridement (n = 76), 45 of them required decompression of some muscular compartment by means of fasciotomy, while 4% of individuals required amputation

Almost all the patients managed conservatively (n = 28) had an uneventful recovery, and among those who needed surgical intervention, 69% (n = 69) had residual wound that needed further management, 3 patients had residual disability (candidates for amputation).

It was observed that 73% of the resultant wounds were managed with split skin grafting (n = 48), 17% of the wounds healed by secondary intention (n = 11) and the remaining 10% (n = 7), had delayed primary closure.

## **V. Discussion:**

Cellulitis is more common in patients with Diabetes and its co-morbidities. But many non- diabetics have lower limb cellulitis that has a better prognosis than diabetic patients. But this group is often overlooked and studies on cellulitis are sparse in the Indian setup. This study was instigated to find out the causes of lower limb cellulitis in non-diabetics and to study the pattern of outcomes while managing these patients.

Most of the patients were in the elder age group which showed that as the age increases, the incidence of cellulitis increases. The prevalence of lower limb cellulitis in females was more in the study group, while males were more affected. In the present study, the prevalence of unilateral lower limb involvement was 86% and 14% of the patients had bilateral lower limb involvement, but according to Smith et al <sup>[5]</sup> the incidence of bilateral lower limb involvement is extremely rare.

Cellulitis superimposed on lower limb edema resulting from chronic kidney disease, lymph edema, and heart failure constituted a considerable proportion of the present study. Superadded fungal infection can be a cause of cellulitis in intertriginous infections and where the bacterial culture was negative. This result was supported by the study by Roujeau et al <sup>[4]</sup> who showed that onychomycosis and dermatophyte infection in the web space can be a risk factor for cellulitis.

Patients with no history of type 2 diabetes mellitus and other co morbidities with lower limb cellulitis can result in severe morbid consequences usually recover with minimal residual disabilities. Recognition of cellulitis in early stages can minimize hospital admission and expenditure.

## **VI. Conclusion:**

The prevalence of lower limb cellulitis in non-diabetics was found to be more in females and in elderly groups. Non-diabetic elderly patients have to be motivated to take care of their feet as the diabetic patients, as neglect of minor trauma or bites can lead to morbid illness necessitating major treatment like skin grafting.

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