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## A Study on Clinical Profile and Prescribing Patterns for Cellulitis in Patients with Foot Ulcer and Its Prevalence in Tertiary Care Hospital



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### ABSTRACT

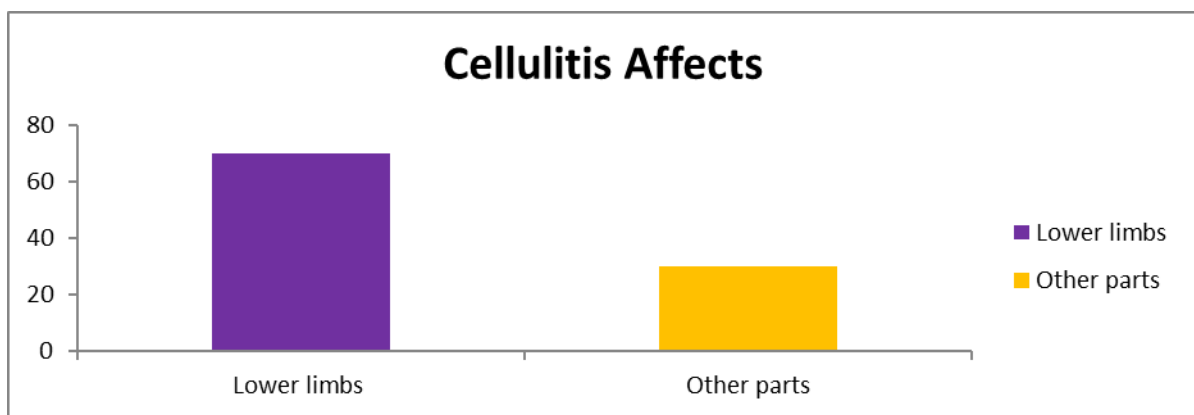
Cellulitis is generally referred to as the infection of the deeper layers of the skin. Early treatment with antibiotics is usually successful. This is a prospective, observational study to evaluate Clinical profile & Prescribing Patterns of cellulitis in foot ulcer. A detailed Patient Clinical Survey form was designed with 30 Questionnaires regarding the clinical status of the patient as well as the prevalent disorder. Data were collected from 120 Patients and enumerated statistical data on 8 parameters and the observations were recorded as graphical interpretations. It indicates that Males are more vulnerable than females as they work in agricultural fields without footwear. Though Diabetes is traced at an early age in adult males, their negligence had shown a high occurrence of Cellulitis in the age group of 60 to 70 years. When it comes to age and gender correlation, males are more affected in the above-mentioned age group than females. Co-morbidity like hypertension does not influence cellulitis. Diabetes is a unique reason. Non-Diabetic cellulitis stands in second place. Surprisingly males who are non-alcoholic and don't smoke are affected in high numbers. Males who were alcoholics and smokers stand in second place. Despite different clinical presentations and symptoms subjects with non-healing ulcers were high in occurrence. Subjects with swelling feet stood second. On random subjects who stayed for 5-10 days in the hospital are more in affected patients. Among the three prescribing patterns Broad-spectrum antibiotics, narrow spectrum, and both, most of the patients were prescribed narrow-spectrum antibiotics and obtained good results.



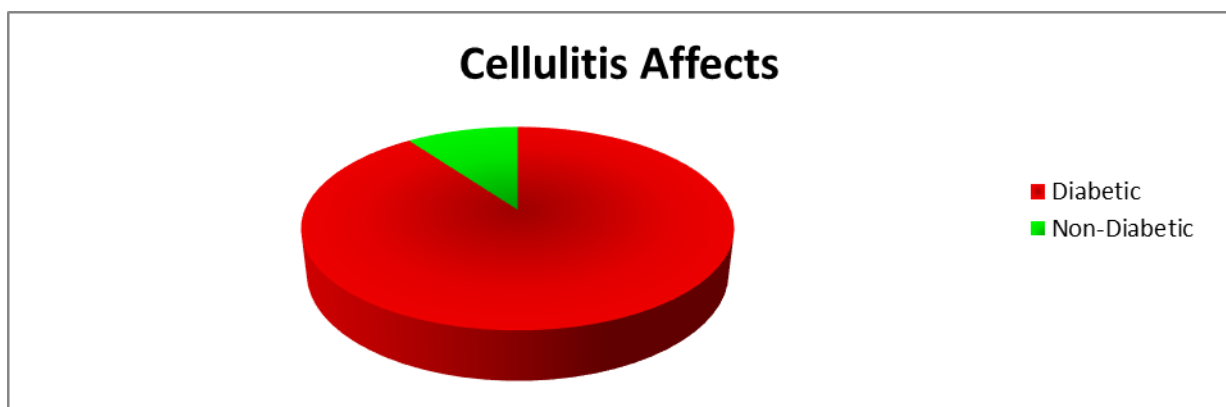
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## INTRODUCTION

Cellulitis is a bacterial infection that occurs in deeper layers of the skin. It occurs suddenly. If not treated, it becomes serious. It will be life-threatening when it spreads into the deeper layers of the skin. Early treatment with antibiotics is usually successful. It can be treated at home, when it becomes serious; they need to spend time in the hospital. Although it affects any part of the body, it appears mostly in the lower legs. It is a painful condition. It is an inflammation of the skin and subcutaneous tissue spreading fast, usually due to an infection. Although it can affect any part of the body, lower limb cellulitis due to foot ulcers is the most common site affecting as many as 70% of the cases.



The relative frequency of foot cellulitis is more than nine times greater in diabetic than in non-diabetic. Despite being a common condition, there are very few studies done on cellulitis in diabetic lower limbs.

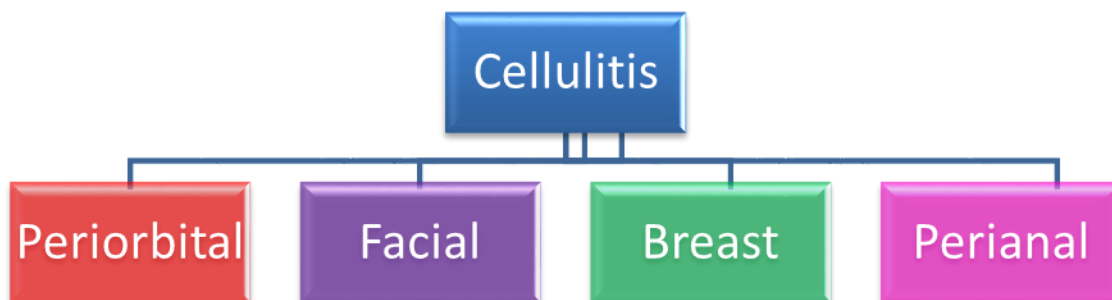


In fact, over the last 2-3 decades, there is little series on cellulitis in diabetic lower from the Indian subcontinent, where the incidence of diabetes is rapidly increasing.

## Types of cellulitis

Cellulitis can be classified into different types, according to where it appears, It can be:

- Around the eyes, known as periorbital cellulitis
- Around the eyes, nose, and cheeks, known as facial cellulitis
- Breast cellulitis
- Peri-anal cellulitis, occurring around the anal orifice.



Cellulitis is associated with the 4 cardinal signs of infection which are, Erythema, Pain, Swelling, Warmth. Physical examination findings that suggest the most likely pathogen include, Skin infection without underlying drainage, penetrating trauma, eschar, or abscess is most likely caused by streptococci.

## Etiology

Bacteria from the Streptococci and staphylococci groups are commonly found on the surface of the skin and cause no harm; however, if they enter the skin, they can cause infection. For the bacteria to access the deeper skin layers, they need a route in, which is usually through a break in the skin. A break in the skin can be caused by:

- ❖ Ulcers
- ❖ Burns
- ❖ Bites
- ❖ Grazes
- ❖ Cuts
- ❖ Some skin conditions, such as eczema, athlete's foot, or psoriasis

- ❖ Some people develop cellulitis without being able to identify a break in the skin.

### **Host factors**

Certain host factors predispose to severe infection. The elderly and individuals with diabetes mellitus are at risk for more severe disease. Also, patients with diabetes, immunodeficiency, cancer, venous stasis, chronic liver disease, peripheral arterial disease, and chronic kidney disease appear to be at higher risk for recurrent infection because of an altered host immune response. Cellulitis due to lymphatic obstruction or venectomy may be caused by non-group A streptococci (ie, groups B, C, and G). Post-venectomy status following saphenous vein stripping can also result in cellulitis. Lymphadenectomy following tumor excision, such as mastectomy, is also a predisposing factor for cellulitis.

### **Pathophysiology**

The pathophysiology of diabetic foot ulcers has neuropathic, vascular, and immune system components, which all show a base relationship with the hyperglycemic state of diabetes. Hyperglycemia produces oxidative stress on nerve cells and leads to neuropathy. Additional nerve dysfunction follows from glycosylation of nerve cell proteins, leading to further ischemia. These cellular changes manifest in motor, autonomic, and sensory components of neuropathic foot ulcers. Damage to motor neurons of the foot musculature may lead to an imbalance of flexors and extensors, anatomic deformities, and eventual skin ulcerations. Damage to autonomic nerves impairs sweat gland function, and the foot may develop decreased ability to moisturize skin, leading to epidermal cracks and skin breakdown. Lastly, patients may not notice foot wounds because of decreased peripheral sensation. Because the blood supply required to heal a diabetic foot ulcer is greater than that needed to maintain intact skin, chronic ulceration can develop.

### **Diagnosis**

- Diagnosis is usually fairly straightforward and does not generally require any complicated tests. A doctor will examine the individual and assess their symptoms. Most cases of cellulitis are caused by streptococci and staphylococci, but other conditions, such as Lyme disease, may look like cellulitis, so it is important to follow up with a doctor after diagnosis. The doctor may take a swab, or sample if there is an open wound. This can help them identify what type of bacteria is causing cellulitis. However, these samples are easily contaminated due to the multiple types of bacteria that live on the skin all the time. Needle aspiration

should be performed only in selected patients or in unusual cases, such as in cases of cellulitis with bullae or in patients who have diabetes, are immune-compromised, are neutropenic, are not responding to empiric therapy, or have a history of animal bites or immersion injury.

- Aspiration or punch biopsy of the inflamed area may have a culture yield of 2-40% and is of limited clinical value in most cases.
- Gram stain of aspiration or biopsy specimens has a low yield and is unnecessary in most cases unless purulent material is draining or bullae or abscess is present; however, Gram stain and culture following incision and drainage of an abscess yields positive results in more than 90% of cases.
- Dissection of the underlying fascia to assess for necrotizing fasciitis may be determined by surgical consultation or indicated following an initial evaluation and imaging studies.
- Skin biopsy is not routine but may be performed in an attempt to rule out a noninfectious entity. The new Amit Jain's staging system is given in the table.

**Table No. 1: Amit Jain's Staging system**

<b>STAGE 1</b>	Cellulitis without abscess or necrosis
<b>STAGE 2</b>	Cellulitis with either localized abscess or skin necrosis or both
<b>STAGE 3</b>	Necrotizing fasciitis without myonecrosis
<b>STAGE 4</b>	Necrotizing fasciitis with myonecrosis

### **Treatment**

Amit Jain's classification of Diabetic foot and its strategy for treatment is a novel approach. Cellulitis always responds rapidly to antibiotics. Some people experience a slight worsening of the reddening of the skin at the start of antibiotic treatment, which usually subsides within a couple of days. Antibiotics are normally taken for 5-10 days, but treatment might last 14 days or more in some cases.

**Table No. 2: The New Amit Jain's Strategy for Treating Cellulitis**

STAGE	TREATMENT STRATEGY
STAGE 1	Broad spectrum antibiotics, limb elevation, and crepe bandage and monitor the patient daily
STAGE 2	Some form of surgical intervention, like drainage of abscess or debridement
STAGE 3	Extensive radical debridement of all the devitalized tissues/ amputation based on extensiveness
STAGE 4	Debridement and some form of amputation is invariably performed

### **Treatment in the hospital**

Some people with severe cellulitis may require hospital treatment, especially if the cellulitis is deteriorating, if the person has a high fever, is vomiting, fails to respond to treatment, or has recurrences of cellulitis. Most people who are treated in hospitals will receive their antibiotics through a vein in their arm (intravenously, using a drip).

### **Management**

Initial management consists of wound cleaning, débridement of necrotic or gangrenous material, and probing the affected area for foreign bodies. Relief of pressure on the ulcer—also known as offloading—is important because it is central to wound healing. Wound dressings can help maintain a moist environment, thereby facilitating healing. Most clinicians use wound dressings to manage foot ulceration, and various types are available commercially.

Adequate studies evaluating the different dressings are necessary; although clinical data regarding the use of topical antibiotics (e.g., silver sulfadiazine, neomycin, polymyxin B, gentamicin, mupirocin) are limited, clinicians may choose to employ dressings in conjunction with antibiotics.

**Table No. 3: Various Types of Dressings**

<b>TYPE OF DRESSING</b>	<b>DESCRIPTION</b>
Nonadherent or low adherence dressing	Atraumatic and provide a moist environment
Hydrocolloids	Controversial but found useful
Hydrogel	Similar to Hydrocolloids
Foams	Provide absorbency and thermal insulation
Alginates	High absorbent, Pack into cavity wound
Iodine preparations	Limited evidence but used commonly
Silver impregnated dressings	Established use for acute and chronic wounds

Allogeneic bi-layered cultured skin equivalent (Apligraf, Organogenesis Inc., Canton, MA) is a living, biological dressing developed from neonatal foreskin and consists of living cells and structural proteins. It is FDA approved for the treatment of diabetic foot ulcers (2000) and was shown to heal more non-infected, non-ischemic chronic plantar diabetic foot ulcers faster in more patients than conventional therapy in a large-scale multi-centered system.

**Table No. 4: Antibiotic Regimen Based On Infection Severity**

<b>INFECTION SEVERITY</b>	<b>ANTIBIOTIC REGIMEN</b>
<b>MILD TO MODERATE</b>	Ciprofloxacin 750mg
	Levofloxacin 750mg
	Clindamycin 300mg
	Cephalexin 500mg
<b>MODERATE TO SEVERE</b>	Vancomycin 1gm
	Meropenem 1gm
	Imipenem 500mg
	Clindamycin 300mg
<b>LIFE-THREATENING</b>	Imipenem 500mg
	Vancomycin 1gm
	Ampicillin 50mg
	Clindamycin 300 mg

## MATERIALS AND METHODS

This study is unique as it not only studies cellulitis and its local complication in diabetic lower limbs but also analyses it through the new Amit Jain's staging system for cellulitis. A project survey form was prepared with the required questionnaire to extract information from the patient.

### Study Site:

Male surgical and Female Surgical wards in District Hospital, Andhra Pradesh Vaidhya Vidhana Parishad (APVPP), Proddatur.

### Plan & Design:

- This is a prospective, observational study to evaluate Clinical profile & Prescribing Patterns of cellulitis in foot ulcer.
- A detailed Patient Clinical Survey form was designed with 30 Questionnaires regarding the clinical status of the patient as well as the prevalent disorder.
- Planned to collect data from approximately 120 Patients of similar disorder and enumerate the statistical data as per the observations.
- The study is designed to project the collected observations in the form of graphical interpretations.
- To evaluate clinical Profile and prescribing patterns of Cellulitis under 8 Parameters collected from patient records.

**Batch size:** 120 Patients

### Study Period:

The study is planned for over 6 months from August 2018- January 2019.

### Study Criteria:

#### i. Inclusion Criteria:

- Patients were well informed about the study and written informed consent was obtained before including them in the study.



➤ Patients of above 15 years and who are admitted in Male and Female surgical wards are involved in it.

ii. Exclusion criteria:

➤ Treatment charts without drugs for cellulitis and foot ulcer are excluded from the study. Pregnant women are excluded from this study.

➤ Age below 14years children is not allowed to participate in the study.

➤ Patients getting admitted to ICU and who were not willing to participate in the study were excluded from the study.

### **Study Procedure:**

Data from each patient was collected by either interview or patient case file or both of the above. The collected data from each Patient was documented and evaluated for study parameters. 120 patients will be enrolled in the study on basis of case reports, treatment charts and lab reports in a specially designed patient data entry form. The outcomes will be measured using the below data:

- Demographic details of the patient.
- Physical examination for cellulitis in foot ulcers.
- Diagnosis of the patients.
- Percentage of drugs for cellulitis and foot ulcers prescribed in the order of preference.
- Average no. of drugs for cellulitis and foot ulcers.
- Dose, dosage form, and route of administration of drugs for cellulitis and foot ulcers.
- Length of stay in hospital.

### **RESULTS**

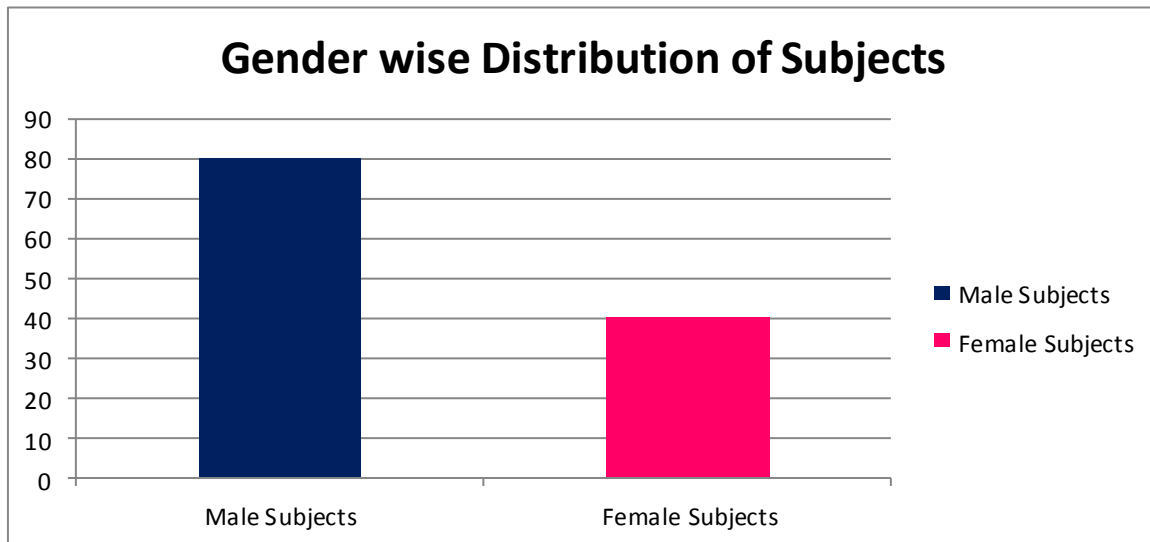
The total number of patients sampled was 120. Out of 120 subjects, 40 are females and 80 are males. All of them had either Cellulitis or Foot Ulcer. Some subjects had both of them. All the subjects had various etiological factors due to which, they were admitted with this condition. All the data regarding the subjects have been characterized based on 8 Parameters.

Those factorial parameters include Gender, Age, Diabetic condition, Personal habits, Clinical presentations, Length of stay in the hospital, and Treatment given.

**I. GENDER DISTRIBUTION:**

**Observation:-**Among 120 subjects, 80 were male subjects and 40 were female subjects. And the data is presented below.

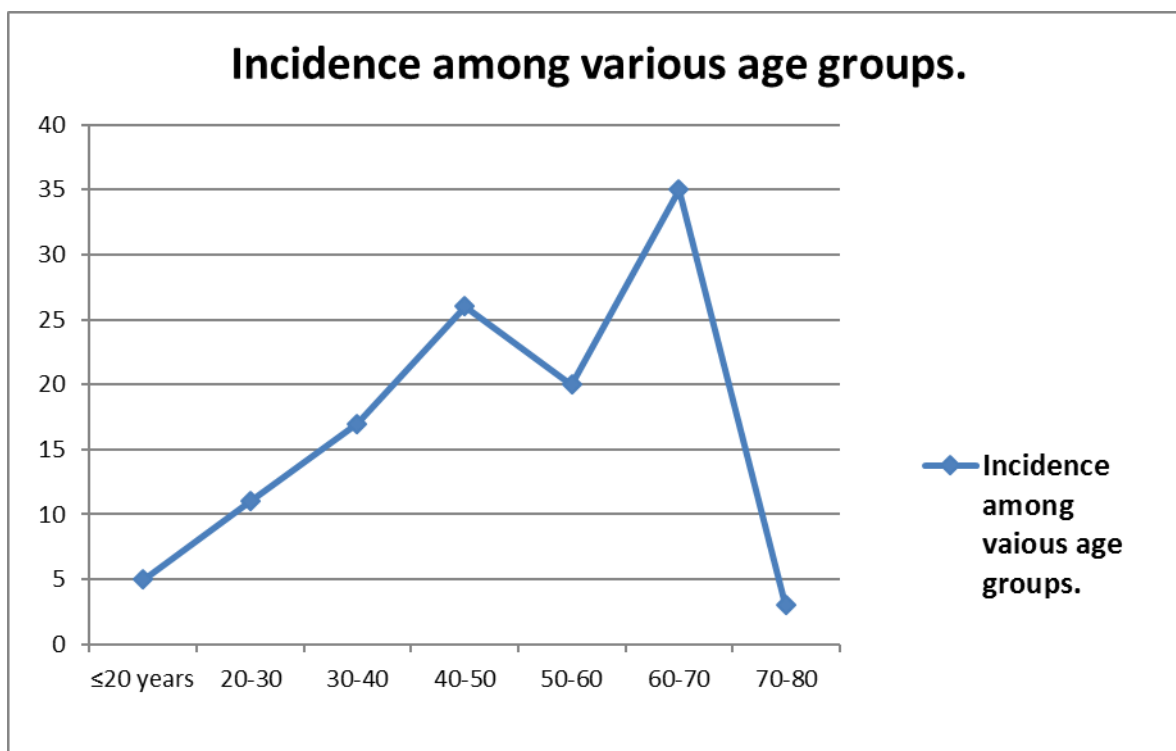
Category	No. of Subjects	Percentage
Male Subjects	80	66.66
Female Subjects	40	33.33



**II. AGE WISE INCIDENCE:**

**Observation:-**The incidence of cellulitis and foot ulcers in various age groups is plotted in the below graph. Among them, 60-70 yrs are maximum (35), and < 20 yrs is minimum (5).

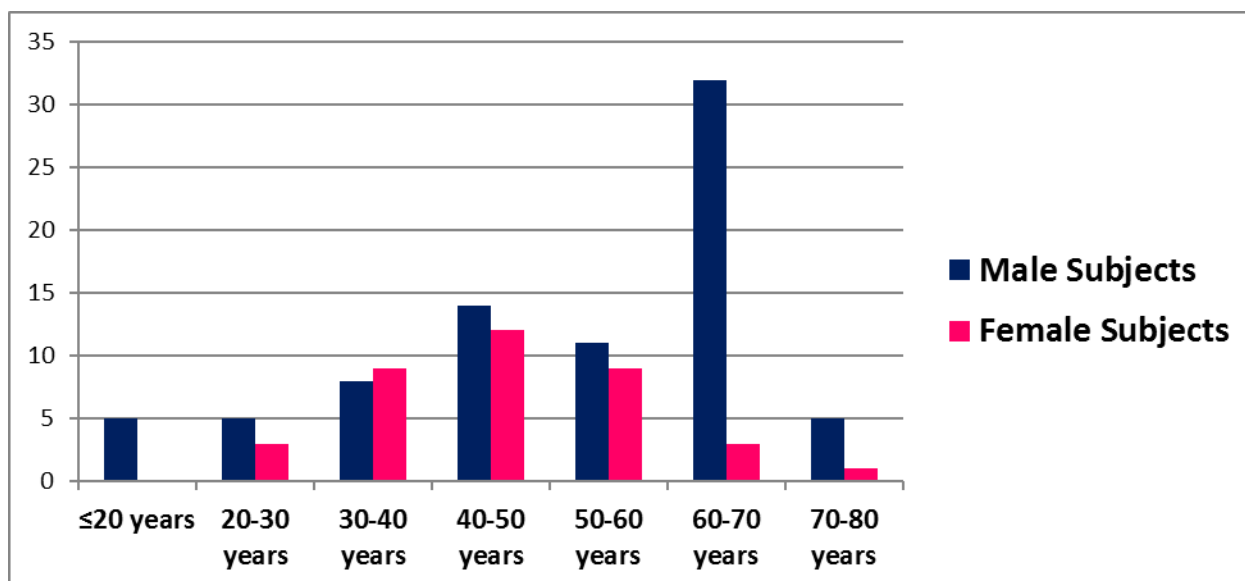
Category	No. Of Subjects	Percentage
≤ 20 Years	5	4.16
20-30 Years	11	9.16
30-40 Years	17	14.16
40-50 Years	26	21.66
50-60 Years	20	16.66
60-70 Years	35	29.16
70-80 Years	6	5



### III. AGE AND GENDER CORRELATION:

**Observation:-**Combining the data from age and gender-wise, a correlation has been drawn and represented in the form of Bar diagram below. Among the 120 subjects, the maximum number of males is between 40-50 years (14 members), and the minimum is in <20 and 20-30 years (5 members each) and the maximum number of females are of between 40-50 years (12 members) and nil in <20 years.

Category	No. of Subjects			
	Male Subjects	Percentage	Female Subjects	Percentage
≤ 20 Years	5	4.16	0	0
20-30 Years	5	4.16	6	5
30-40 Years	8	6.66	9	7.5
40-50 Years	14	11.66	12	10
50-60 Years	11	9.16	9	7.5
60-70 Years	32	26.66	3	2.5
70-80 Years	5	4.16	1	0.83

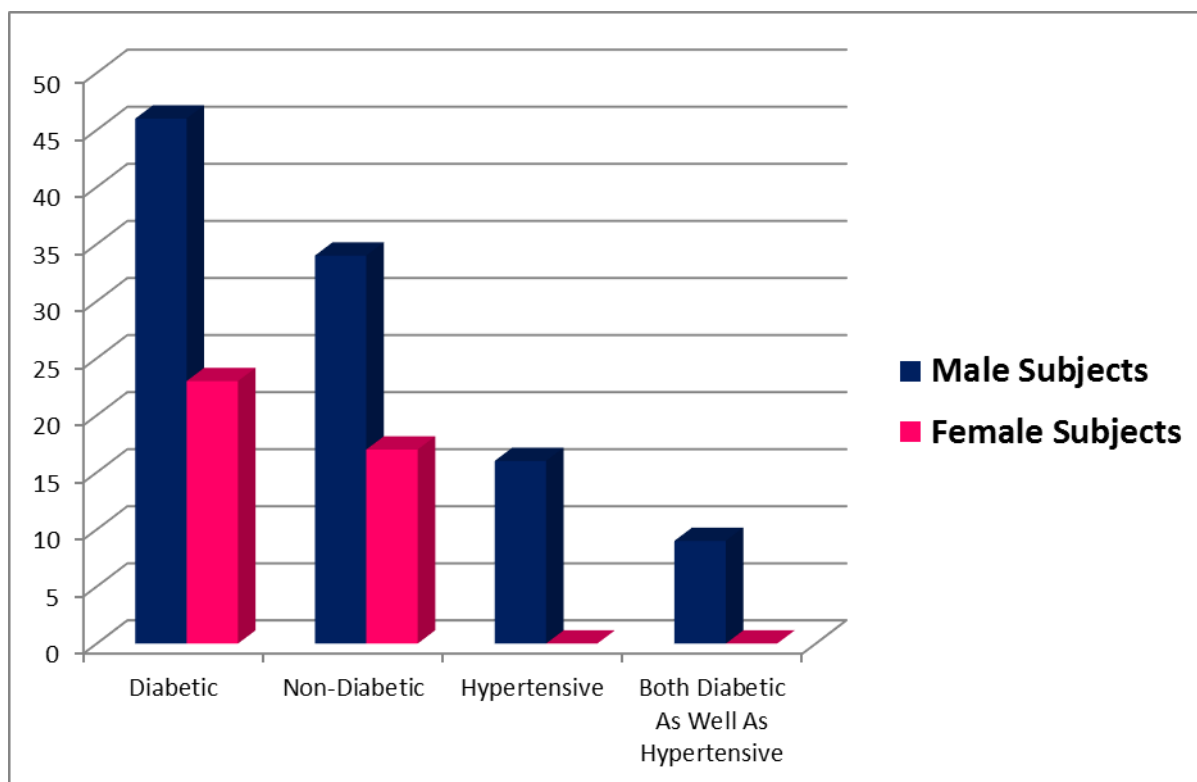


#### IV. INFLUENCE OF CO-MORBIDITY LIKE HYPERTENSION:

**Observation:-**The subjects are characterized into two groups. Diabetic and Non-Diabetic. Among Diabetic subjects, some have Hypertension also. Several males with diabetes were (46 members) and Nondiabetic patients (34 members). The number of males with hypertension was (16 members) and both diabetics and hypertension were (9 members). The number of females with diabetes was (23 members) and nondiabetic patients were (17 members). The number of females with hypertension was (0 members) and both diabetics and hypertension were also zero.

All this data is represented below as a bar diagram.

Category	No. of Subjects			
	Male Subjects	Percentage	Female Subjects	Percentage
Diabetic Subjects	46	38.33	23	19.16
Non-Diabetic Subjects	34	28.33	17	14.16
Hypertensive Subjects	16	1.88	0	0
Subjects with both Diabetes and Hypertension	9	7.5	0	0

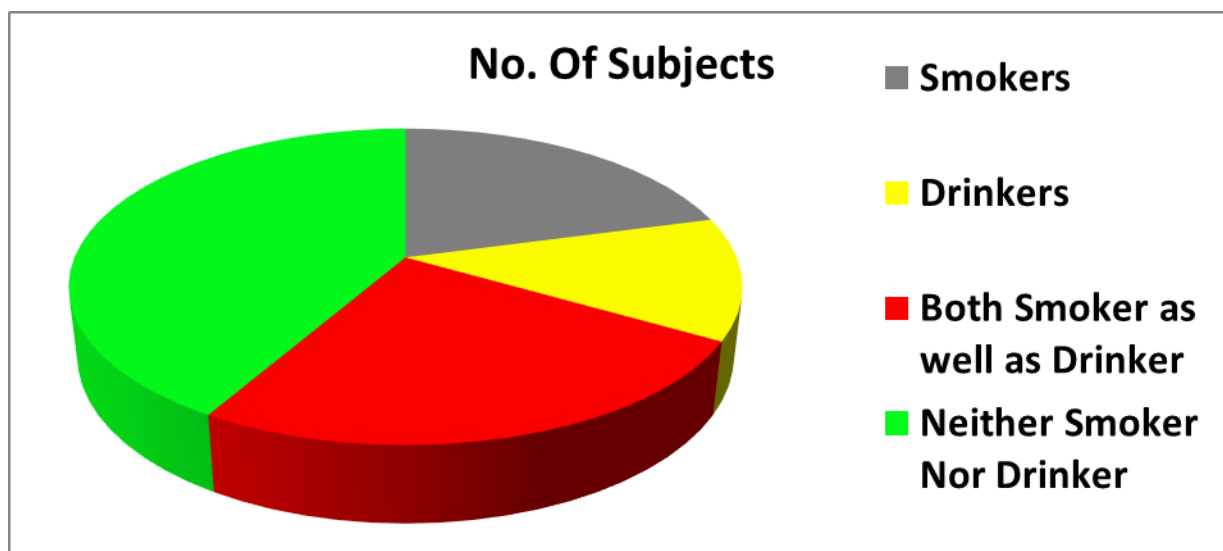


#### V. SEGREGATION BASED ON LIFESTYLE HABITS:

**Observation:-** Personal habits like Smoking, Drinking Alcohol, the subjects have been characterized into four groups. They are, Smokers (25), Drinkers (15), Smoker as well as Drinker(30), and Neither Smoker Nor Drinker(50). The maximum number of patients was neither smoker nor drinker and the minimum number of patients were drinkers.

The data is represented below as a pie diagram.

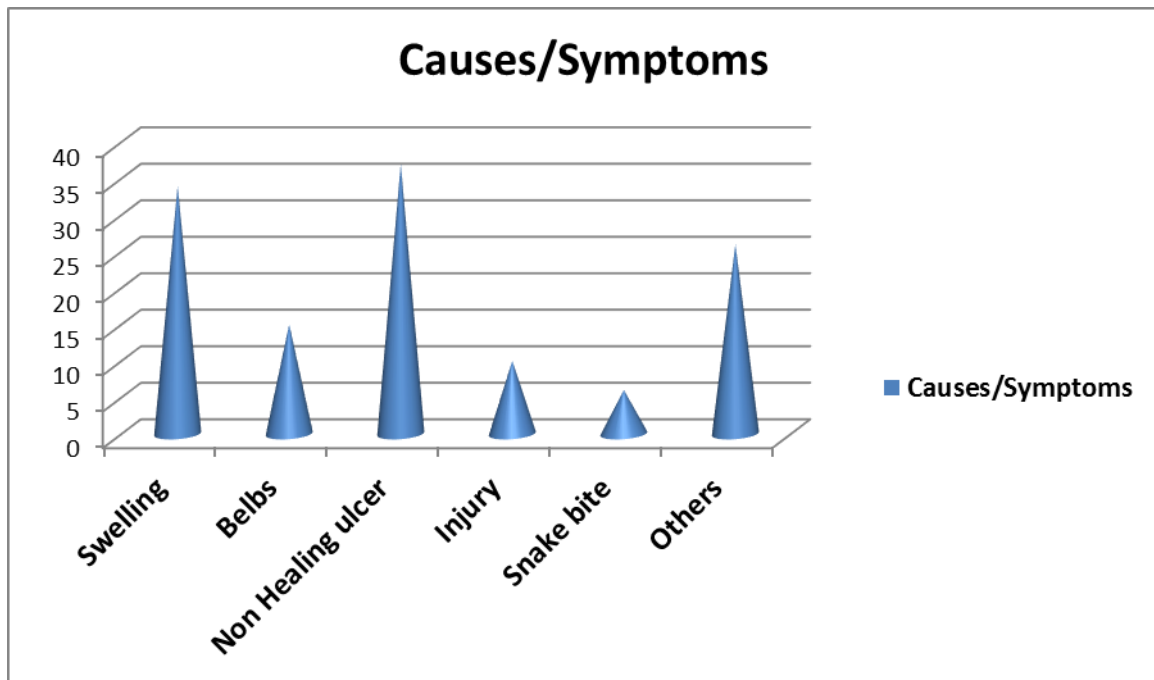
Personal Habits	No. Of Subjects	Percentage
Smoking	25	20.83
Alcohol	15	12.5
Both Drinker as well as Smoker	30	25
Neither Smoking Nor Drinking	50	41.66



## VI. DATA BASED ON CLINICAL PRESENTATION:

**Observation:-**The subjects suffered from various symptoms due to different causes such as Swelling, Blebs, Non-Healing Ulcer, Injury, and Others. The majority of patients came with non-healing ulcers (37 members) and minimum patients came with snake bite (6 members). This data is represented with a column diagram below,

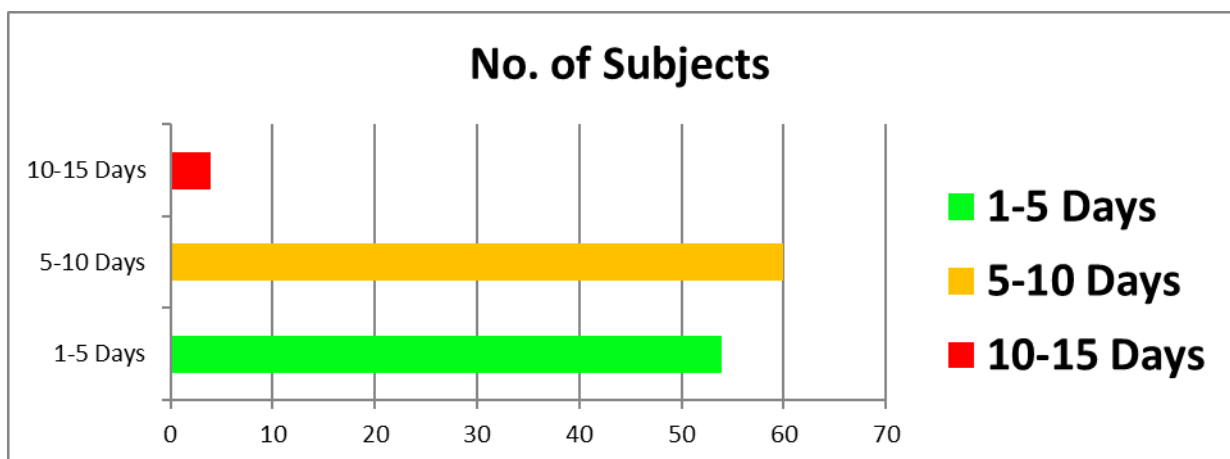
Cause/Symptom	No. of Subjects	Percentage
Swelling	34	28.33
Blebs	15	12.5
Non Healing Ulcer	37	30.83
Injury	10	8.33
Snake Bite	6	5
Others	26	21.66



**VII. DISPERSION BASED ON LENGTH OF STAY IN HOSPITAL:**

**Observation:-**The duration for which the subjects were taking the medication, the data has been interpreted as below, majority number of patients (60) stayed in the hospital for 5-10 days and a minimum number of patients (6) stayed in the hospital for 10-15 days, 54 patients stayed in the hospital for 1-5 days.

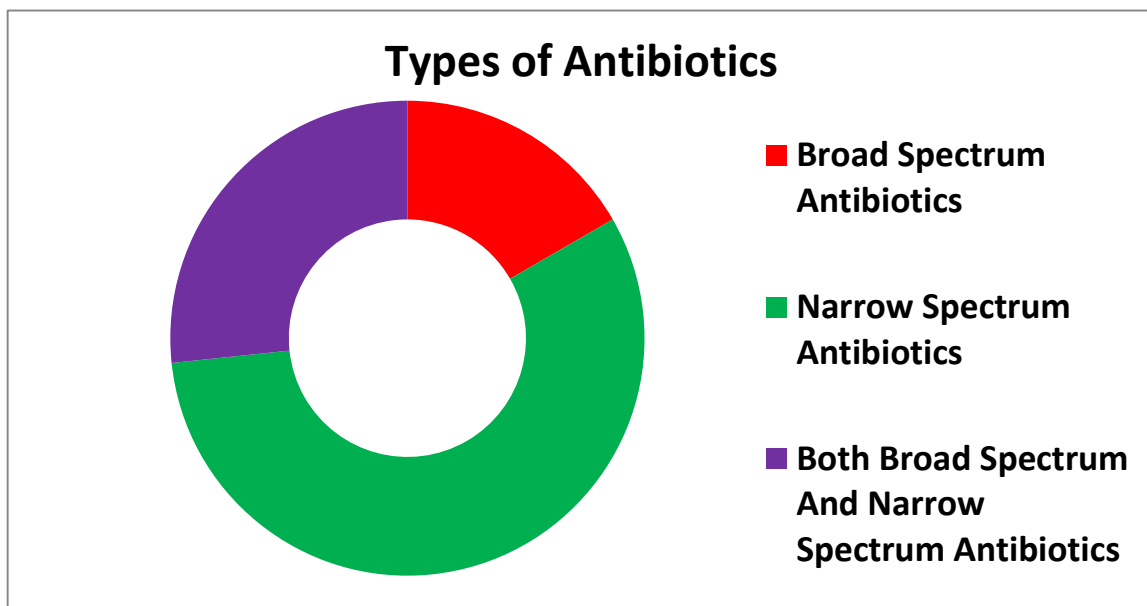
Length of Stay in Hospital	No. of Subjects	Percentage
1-5 Days	54	45
5-10 Days	60	50
10-15 Days	6	5



### VIII. DATA BASED ON TREATMENT PRESCRIBED:

**Observation:-**All the subjects have been prescribed with Antibiotics. Among these, some were Broad Spectrum Antibiotics and Narrow Spectrum Antibiotics. Some subjects were prescribed with both of these. 20 number of patients were prescribed with broad-spectrum antibiotics, 68 number of patients were prescribed with narrow-spectrum antibiotics, 32 number of patients were prescribed with both broad as well as narrow-spectrum antibiotics. The data is given below and represented as a donut.

Types of Antibiotics	No. of Subjects	Percentage
Broad Spectrum	20	16.66
Narrow Spectrum	68	56.66
Both Broad & Narrow Spectrum	32	26.66



### DISCUSSION

Cellulitis of the lower limb often requires hospitalization and intravenous antibiotics initially along with limb elevation and crepe bandage elevation. **Stage 1** cellulitis is treated conservatively. It may progress to form an abscess or localized necrosis or both leading to **Stage 2**. This stage requires surgical intervention. Often one needs to identify necrotizing fasciitis which is the symptom of **Stage-3**. Finally, severe necrotizing fasciitis may lead to myonecrosis which is **Stage-4**.



In our study 66.66% subjects were Male while 33.33% of subjects were Female. Among 120 subjects, all suffered either from Cellulitis or Foot Ulcer. Of all these subjects, 4.16% are in below 20 years age group (4.16% Male and 0% Female). 9.16% are in 20-30 years age group (4.16% Male and 5% Female). 14.16% are in 30-40 age group (6.66% Male 7.5% Female). 21.66% belong to 40-50 age group (11.66% Male 10% Female). 16.66% belong to 50-60 age group (9.16% Male 7.5% Female). 29.16% are in 60-70 age group (26.16% Male 2.5% Female). 5% belong to 70-80 age group (4.16% Male 0.83% Female).

Among these various age groups, there were subjects with different conditions such as Diabetic, Non-Diabetic, Hypertensive as well as Diabetic and Hypertensive. 38.33% of male subjects and 19.16% of Female subjects were Diabetic. 28.33% of male subjects and 14.16% of Female subjects were non Diabetic. 1.88% of Male Subjects were Hypertensive and female hypertensive are nil. 7.5% Male subjects were Diabetic as well as Hypertensive whereas female subjects are nil. All of these 120 subjects were categorized under one or more of the personal habits such as Smoking, Alcohol drinking, Both smoking and drinking, and Neither smoking nor drinking. 20.83% of subjects were Smoking. 12.5% of subjects were Drinking Alcohol. 25% of subjects were smoking as well as drinking. 41.66% of subjects were neither smoking nor drinking.

The subjects suffered from varying causes/symptoms such as Swelling, Blebs, Non-Healing Ulcer, Injury, Snake Bite, and Others. 28.33% of subjects had Swelling. 12.5% of subjects had Blebs. 30.83% of the subjects had Non-Healing Ulcers. The cause of 8.33% of subjects was Injury. The cause of 5% of subjects was Snake Bite. 21.66% of subjects had others. Depending on the length of stay of subjects in the hospital, they are categorized under 1-5 days, 5-10 days, and 10-15 days groups. 45% of the subjects stayed for 1-5 days. 50% of the subjects stayed for 5-10 days. 5% of the subjects stayed for 10-15 days.

Based on treatment options available in Andhra Pradesh Vaidhya Vidhana Parishad, Proddatur, the subjects have been categorized into three groups. They are Broad Spectrum Antibiotics, Narrow Spectrum Antibiotics, and Both Broad and Narrow Spectrum Antibiotics. 16.66% of subjects were prescribed with Broad Spectrum Antibiotics only. 56.66% of subjects were prescribed with Narrow Spectrum Antibiotics only. 26.66% of subjects were prescribed with both Broad Spectrum and Narrow Spectrum Antibiotics. Increasing physicians' ability to identify the "foot at risk," along with proper foot care, may prevent diabetic foot ulceration and thus reduce the risk of amputation.

## CONCLUSION

The present review aims to summarize the causes and pathogenic mechanisms leading to diabetic foot and to focus on the management of this important health issue. The outcomes of this study are as below:

I. It indicates that Males are more vulnerable than females as they work in agricultural fields without footwear.

II. Though Diabetes is traced to at an early age, negligence leads to a high occurrence of Cellulitis in the age group of 60 to 70 years.

III. When it comes to age and gender correlation, males are more affected in the above-mentioned age group than females.

IV. Co-morbidity like hypertension does not influence cellulitis. Diabetes is a unique reason. Non-Diabetic cellulitis stands in 2<sup>nd</sup> place.

V. Surprisingly males who are non-alcoholic and don't smoke are affected in high numbers. Males who were alcoholics and smokers stand in 2<sup>nd</sup> place.

VI. Despite different clinical presentations and symptoms subjects with non-healing ulcers were high in occurrence. Subjects with swelling feet stand 2<sup>nd</sup> in occurrence.

VII. On random subjects who stayed for 5-10 days are more in affected patients.

VIII. Three patterns of prescriptions were recorded. Broad-spectrum antibiotics, Narrow spectrum, and both. Most of the patients were prescribed with narrow-spectrum antibiotics.

More research has to be carried out to unveil the prevalence of cellulitis in rural areas where Diabetes is neglected leading to cellulitis unknowingly.

## REFERENCES

- 1 Kilburn SA, Featherstone P, Higgins B, Brindle R. Interventions for cellulitis and erysipelas (Review). The Cochrane Library. 2010 Issue 6.
- 2 <http://www.nhs.uk/Conditions/Cellulitis/Pages/Introduction.aspx>
- 3 Phoenix G, Das S, Joshi M. Diagnosis and Management of Cellulitis. British Medical Journal. 2012 Aug; 345:e4955.
- 4 CREST (2005) Guidelines on the management of cellulitis in adults. Clinical Resource Efficiency Support Team. [www.gain-ni.org](http://www.gain-ni.org)
- 5 Kumar P, Clark M. Clinical Medicine. 8th edition. London: Elsevier Ltd; 2012.
- 6 Clinical Knowledge Summaries – Cellulitis

- 7 CKS.nice.org.uk/cellulitis-acute
- 8 UCLH Skin and Soft Tissue Infections (Adults) Clinical Guidelines Trust-Wide, 01/10/2012
- 9 Chapman A, Seaton R, Cooper M, Hedderwick S, et al. Good practice recommendations for outpatient parenteral antimicrobial therapy (OPAT) in adults in the UK: a consensus statement. *J Antimicrob Chemother* 2012; 67: 1053–1062 doi:10.1093/jac/dks003 Advance Access publication 31 January 2012
- 10 The College of Optometrists CLINICAL MANAGEMENT GUIDELINES Cellulitis preseptal and orbital
- 11 Carratala` J, Roso´n B, Ferna´ndez-Sabe´ N et al. Factors associated with complications and mortality in adult patients hospitalized for infectious cellulitis. *Eur J Clin Microbiol Infect Dis* **2003**; 22:151–7.
- 12 Beltran J, Chandnani V. McGhee RA Jr, Kursunoglu- Brahme S. Gadopentetatedime glumine-enhanced MR imaging of the musculoskeletal system. *AiR*1991;156:457-466
- 13 Morrison WB, Schweitzer ME, Bock GW, et al. Diagnosis of osteomyelitis: utility of fat-suppressed contrast-enhanced MR imaging. *Radiology* 1993;189:251-257
- 14 Bernard Rosner. In: Fundamentals of Biostatistics, 5th Edition, Duxbury, 2000.
- 15 Robert H Riffenburg. In: Statistics in Medicine, 2nd Edition, Academic press; 2005.
- 16 Jain AKC, Viswanath S. Evaluation and Management of Cellulitis and its Local
- 17 Complications in Diabetic Lower Limb using the New Amit Jain’s Staging System for Cellulitis-a retrospective study. *SEAJCRR*. 2015;4(2):1392-401.
- 18 Lavery LA, Armstrong DG, Wunderlich RP, et al. Diabetic foot syndrome: evaluating the prevalence and incidence of foot pathology in Mexican Americans and non-hispanic whites from a diabetes disease management cohort. *Diabetes Care*. 2003;26 (5):1435-1438.
- 19 Pecoraro RE, Reiber GE, Burgess EM. Pathways to diabetic limb amputation. Basis for prevention. *Diabetes Care*. 1990;13(5): 513-521.
- 20 Gordois A, Scuffham P, Shearer A, et al. The health care costs of diabetic peripheral neuropathy in the US. *Diabetes Care*. 2003; 26(6):1790-1795.
- 21 Sumpio BE. Contemporary evaluation and management of the diabetic foot. *Scientifica*. 2012;435487.

