

**A Clinical Study on Diabetic Foot Guntur Medical College, Guntur****M. Govindu Naik<sup>1</sup>, K Naga Santosh Kumar<sup>2</sup>, K. Vinay Kumar<sup>3</sup>, Pustela Mahesh Kumar<sup>4</sup>**<sup>1</sup>Associate Professor, Department of General Surgery, Guntur Medical College, Guntur<sup>2</sup>Assistant Professor, Department of General Surgery, Guntur Medical College, Guntur<sup>3</sup>Assistant Professor, Department of General Surgery, Guntur Medical College, Guntur<sup>4</sup>Assistant Professor, Department of General Surgery, Guntur Medical College, Guntur

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**Abstract:**

**Background and Objectives:** Diabetes Mellitus is common endocrine disorder. Its knowledge is important because of high prevalence. The diabetic foot can be divided into the neuropathic foot in which the neuropathy predominates and the ischemic foot where occlusive vascular disease is the main factor. The clinical study on diabetic foot is undertaken to assess the various presentations of diabetic foot like ulceration, resistant deep infections, Cellulitis and severe ischemia leading onto gangrene and to study percentage of surgical intervention like debridement, minor/major amputations.

**Methods:** 1536 patients admitted in surgical wards as above will be considered as data source using clinical proforma in 318 patients over a period of 2 years. It is a simple case study where the mode of presentation and the percentage of patients going for surgical intervention are studied.

**Results:** Most of the diabetic patients were in the age group of 46 – 65 years (65%). Out of 318 cases studied, there was a male predominance in occurrence of diabetic lesions. 72% were male patients and 28% were female patients. The most common presentation of a diabetic patient with a foot lesion was Toes lesion which was about 30%. Non healing ulcer was the commonest mode of presentation in about 44% of patients followed by Cellulitis in 34% of patients; gangrene in 17% and abscess in 5% of patients. Out of 318 cases studied 188 cases that is 59% of patients were treated with minor procedures and 130 cases that is 41% were treated with major surgical procedures.

**Conclusion:** Diabetic foot is more common in the elderly but younger age groups are not spared. Incidence of diabetic foot is more common in males when compared to females. Non healing ulcer is the most common mode of presentation. Neuropathy and vasculopathy are the most common pathology and the patients with neuropathy are more prone for the development of diabetic foot. Early detection and prompt treatment will decrease the incidence of complications of diabetic foot.

**Keyword:** Diabetes Mellitus; Diabetic Foot; Neuropathy; Vasculopathy; Amputations.

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**Introduction**

Diabetes is a common endocrine disorder and worldwide problem. The estimated number of patients with diabetes in India is 50.8 million according to international diabetes foundation, which is 1st among the top 5 countries with most diabetes sufferers. About 1.30 million diabetic patients develop diabetic foot ulcers in one point of time or other during the course of their illness and 58 deaths per 1000 per each year.

The diabetic foot disease is one of the most frequent causes of hospitalization and is one of the most expensive complications of diabetes. We can get a measure of the problem by knowing in our country the frequency, types and causes of diabetic foot lesions and the way the injury and infection contribute to it. The etiopathogenesis of diabetic

foot lesions are multifactorial. Diabetic neuropathies, vasculopathy, poor control of diabetes and bacterial infection are some of them. [1] The reasons for diabetic foot are: Foot is the most vulnerable part of body for injury and infection neglected by patient and the site of preference for neuropathy and ischemia is also the foot.

According to Modi et al., overall incidence of diabetics in India is 1.2%. The death in each year is due to its complications (2.1% in urban, 1.5% in rural), which are usually common in age group of 40 – 60 years affecting both sexes equally. The complications are more prevalent among the people of lower economic due to negligence, illiteracy and poverty. [2] The Lord Moynihan's great dictum

“Surgery has been made safe for patients. We must now make patients safe for Surgery.”

In this Clinical Study on Diabetic Foot, 1536 cases attended to the surgical wards among them 318 cases are studied in Government General Hospital/Guntur Medical College, Guntur, and Andhra Pradesh for a period of 2 years in between November 2021- October 2023. Careful evaluation of mode of presentation and treatment of diabetic foot is done in this study.

### Objectives

The clinical study on diabetic foot is undertaken to assess: The various presentations of diabetic foot like ulceration, resistant deep infections, Cellulitis and severe ischemia leading on to gangrene; to study percentage of surgical intervention like debridement, minor/major amputations.

### Methodology

1536 patients attended in male and female surgical wards of Government General Hospital/Guntur

Medical College, Guntur, who are diagnosed as diabetic foot, among them 318 patients selected to this study for a period of 2 years in between November 2021- October 2023.

1536 patients admitted to surgical wards as above will be considered as data source using clinical proforma in 318 patients. It is a simple case study where the mode of presentation and the percentage of patients going for surgical intervention are studied.

**Inclusion criteria:** All patients in the age group of 15-85 years, with a known history of diabetes and diagnosed diabetic on admission with a diabetic foot.

**Exclusion criteria:** Patients with systemic disease like IHD, Venous ulcers and pregnant are not included in the study.

### Results

**Table 1: Age Distribution**

Age	Number of cases	Percentage
15-25	4	1%
26-35	8	3%
36-45	54	17%
<b>46-55</b>	<b>92</b>	<b>29%</b>
<b>56-65</b>	<b>114</b>	<b>36%</b>
66-75	36	11%
76-85	8	2%
>85	2	1%
Total	318	100%

**Table 2: Sex Distribution**

Sex	Number of cases	Percentage
<b>Male</b>	<b>228</b>	<b>72%</b>
Female	90	28%
Total	318	100%
M:F	3:1	

**Table 3: Site of the Lesion**

Site of the lesion	Number of cases	Percentage
Dorsum of the foot	86	27%
<b>Toes</b>	<b>96</b>	<b>30%</b>
Sole	58	18%
Foot and leg	78	25%
Total	318	100%

**Table 4: Type of Lesion**

Lesion	Number of cases	Percentage
<b>Non healing ulcer</b>	<b>140</b>	<b>44%</b>
Abscess	16	5%
Cellulitis	108	34%
Gangrene	54	17%
Total	318	100%

**Table 5: Pathology of the Diabetic Foot**

Pathology	Number of cases	Percentage
Neuropathy	162	51%
Vasculopathy	120	38%
Both	24	7%
No neuropathy, No vasculopathy	12	4%
Total	318	100%

**Table 6: Treatment**

Treatment	Number of cases	Percentage
Conservative	1218 which was in OP, IP& Casualty except study cases	80%
Surgical	318 (Study Cases)	20%
Total	1536	100%

**Table 7: Type of Operation**

Operation	Number of cases	Percentage
Minor	188	59%
Major	130	41%
Total	318	100%

## Discussion

**Table 8: Age Wise Distribution**

Age (Years)	Mayfield JA et al [3]	Present Study
15-25	-	4
26-35	2	8
36-45	15	54
46-55	29	92
56-65	34	114
66-75	20	36
76-85		8
>85		2

The most common period in the study during the patients presented with diabetic foot lesion was between 46-65 years which is also the common period in Mayfield JA et al study though percentage of cases differed to some extent. This study indicates that diabetic foot complications are usually occurs in the elderly.

**Table 9: Sex Distribution**

Sex	Mayfield JA et al [3]	Present Study
Male	53	228
Female	47	90

Like Mayfield JA et al study, the present study had more number of male patients (228) suffering from diabetic foot lesions than females (90). The present study had ratio of male: female as 3:1 whereas in Mayfield JA et al study male: female ratio was almost equal.

**Table 10: Site of the Lesion**

Site	Alpqvist J [4]	Present Study
Dorsum of the foot	14	86
Toes	51	96
Footandleg	-	88
Sole	28	68

The present study had involvement of the toes in 96 patients, whereas in Alpqvist J study there the most common site of involvement was toes in 51 patients.

**Table 11: Mode of Presentation**

Lesion	Queri FA [5]	Zafar A [6]	Present Study
Non healing ulcer	20	21%	140
Abscess	-	31%	16
Gangrene	13	12.5%	54
Cellulitis	13	-	108

Like Queri FA, non-healing ulcer was the most common presentation, 140 (44%) patients. It is comparable to other study.

**Table 12: Pathology of the Diabetic Foot**

Pathology	Margolis DJ [7]	Present Study
Neuropathy	50%	51%
Vasculopathy	20%	38%
Both	30%	7%
No neuropathy/Vasculopathy	-	4%

Like Margolis DJ study, the present study shows neuropathy as the most common pathology for the development of diabetic foot. So, it is almost equal to Margolis DJ study.

**Table 13: Types of Operation**

Operation	Khan AH [8]	Present Study
Minor	140	188
Major	17	130

Out of 318 cases undergoing operative intervention in the present study, 188 (59%) patients underwent minor surgical procedures which included debridement, skin grafting, Toe disarticulation, Ray's amputation and 130 (41%) patients underwent major operations which included below knee or above knee amputations. This is comparable with the Khan AH study.

### Conclusion

Diabetic foot infection is being the most common complication of diabetes mellitus reporting to surgeons requires multi-disciplinary approach for its management.

Effective control of infection and diabetes itself along with surgical procedures required according to the grade of infection are most important steps in the management of such patients.

In this study conducted for a period of 2 years in between November 2011 to October 2013 at Government General Hospital, Guntur and of 1536 diabetic patients with different severity of foot infections presented in Casualty, outpatient and surgical wards.

Out of 1536 diabetic foot patients 1218 cases were treated by conservative management includes antibiotics, control of diabetes, off-loading a diabetic foot and dressing. 318 patients were treated by various surgical procedures.

Diabetic foot is more common in the elderly but younger age groups are not spared. Incidence of diabetic foot is more common in males when compared to females. Non healing ulcer is the most common mode of presentation because of the various pathologies involved like neuropathy, vasculopathy or both. Neuropathy and vasculopathy are the most common pathology and the patients with neuropathy are more prone for the development of diabetic foot. Early detection and

prompt treatment will decrease the incidence of complications of diabetic foot.

In case of known diabetic foot multi-disciplinary approach to wound care like diabetic foot care education, pressure off loading of foot including total contact casting, removable walking boots, half shoes and ankle foot orthoses considered the gold standard for off-loading the foot.

With appropriate insulin therapy expectancy of life in diabetic patients increased. It is advised to avoid trauma to the foot, about foot wear and satisfactory control of diabetes mellitus.

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