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A prospective study of clinical profile of diabetic foot patients attending the department of surgery from March 2022 to dec 2023

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ABSTRACT:
Background Lower extremity ulcers represent a major concern for patients with diabetes from both a quality of life and an economic standpoint.' Studies to evaluate quality of life have shown that patients with diabetic foot ulcers have decreased physical, emotional and social functions. Diabetic patients form 9% of total population of India[1]. The lifetime risk of a person with diabetes developing a foot ulcer would be as high as 25%[2]. About 21.4% diabetic patients undergo lower extremity amputation. This is the study that documents the presentation and outcome of Diabetic foot patients management in RMC , Loni.
Materials and Methods:
This is a prospective study of all patients admitted for of Diabetic foot between March 1, 2022, and decemeber 23, 2023. A structured questionnaire containing patients demographics, operation findings, and outcome was filled upon discharge or death.
Results: Most patients present with diabetic foot lesion in 7th decade of life females are more with male to female ratio 1:1.5 .In our study we observe that lack of knowledge regarding diabetes and ignorance about control of diabetes .
Trauma was the most common precipitating factor. Barefoot walking predisposes the diabetic foot condition. Almost all patients in our study are from rural area, so they are more vulnerable to diabetic related complications due to lack of awareness and late presentation to hospitals.
Conclusion: Diabetic foot lesions are significant health problems at some time in the life of diabetic patients. It commonly results from a combination of neuropathy, vasculopathy and infection in lower extremity . Proper evaluation and control of risk factors like habits of walking barefoot ,smoking, alcohol, poor blood glucose control , anemia and lack of preventive foot care lead the forthcoming complications needing some sort of amputation .Setting up a multidisciplinary foot care team has been found to be accompanied by a drop in the number of amputations

Keywords
Diabetic foot , Wagner's grade, amputations, lower extremity ulcers.

Introduction

Lower extremity ulcers represent a major concern for patients with diabetes from both a quality of life and an economic standpoint.' Studies to evaluate quality of life have shown that patients with diabetic foot ulcers have decreased physical, emotional and social functions. Diabetic patients form 9% of total population of India[1]. The lifetime risk of a person with diabetes developing a foot ulcer would be as high as 25%[2]. About 21.4% diabetic patients undergo lower extremity amputation[3]. The issue of Lancet[4] dedicated to the problems of the diabetic foot carried the dramatic message that "Every 30 seconds a lower limb is lost somewhere in the world as a consequence of diabetes". Bell[5] calculated that incidence of atherosclerotic gangrene is 53 times more common in diabetics than in non diabetics. The vast majority of

diabetic foot complications resulting in amputation begin with formation of skin ulcers. Early detection and appropriate treatment of these ulcers may prevent 85% of amputations[6].

It is still unfortunate that "diabetic foot" contributes significantly to the number of amputations. However many of these problems can be prevented by teamwork of multiple medical disciplines. This begins with patient's education.

When a patient develops a "diabetic foot", the problems are frequently multiple and complex requiring a variety of medical skills for their management. Today it is possible to prevent diabetic foot lesions, salvage and maintain a functional foot The modern trend in surgery of diabetic foot has shifted to more conservative approach and attempts to reduce morbidity of more proximal amputations.

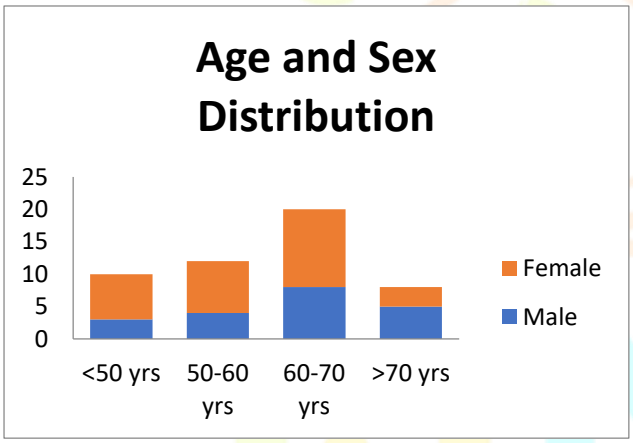
This study emphasizes an imperative approach to the treatment of diabetic foot and attempts to minimize amputations and its forthcoming social, economical and mental problems. It is expected that this study will provide a positive approach in care of treatment of diabetic foot lesion and put an end to old nihilistic attitude.

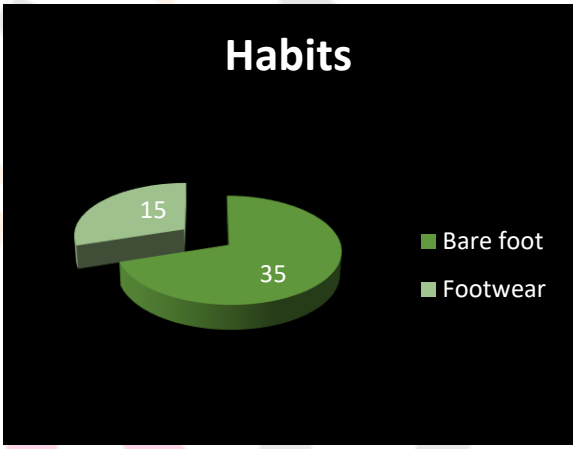
Materials and Methods :

This is a prospective study of all patients admitted for of Diabetic foot between March 1, 2022, and December 23, 2023. A structured questionnaire containing patients demographics, operation findings, and outcome was filled upon discharge or death

Statistical comparisons were performed using the chi-square test and student's 't' test. Data will be analysed for Age wise distribution, Gender wise distribution.

Results:





In present study, maximum number of patients belongs to 60-70 years age group. The number of males in present study was 20(40%) and that of females was 30 (60%). Females were affected more than Males.

In the present study, 35 (70%) patients walked bare foot and 15(30%) patients were using footwear. Out of 35 patients who walked bare foot 12 (34%) needed amputation.

figure **2: Bare foot v/s Amputation**

In the present study, 18 (36%) patients were known smokers, 12 (24%) were alcoholic. Smokers and alcoholics were observed for vascular and neuropathic complications

Complications	No Of Smokers / Alcoholics With Complications		Total No Of Patients With Complications.
	Smokers	Alcoholics	
Vascular	10	9	26
Neuropathy	6	5	18

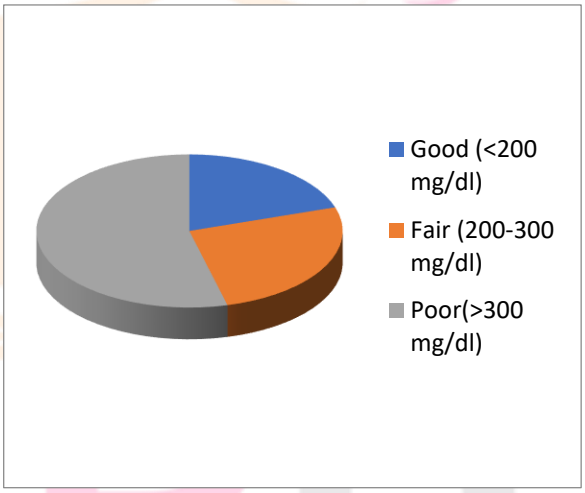
10 smokers and 9 alcoholics were found to have vascular complications. 6 smokers and 5 alcoholics were having neuropathic complications.

In present study of 50 patients, 24 (48%) patients were known diabetics at the time of admission. Maximum number of patients i.e. 14 (28%) patients had diabetes for 1-5 years in past. In present series, 26 (52%) patients were detected as diabetic at the time of admission.

Duration	Number of Patients
Newly detected	26(52%)
1 yrs	06(12%)
1 - 3 yrs	07(14%)
3 - 5 yrs	07(14%)
5 - 10 yrs	02(4%)
>10 yrs	02(4%)

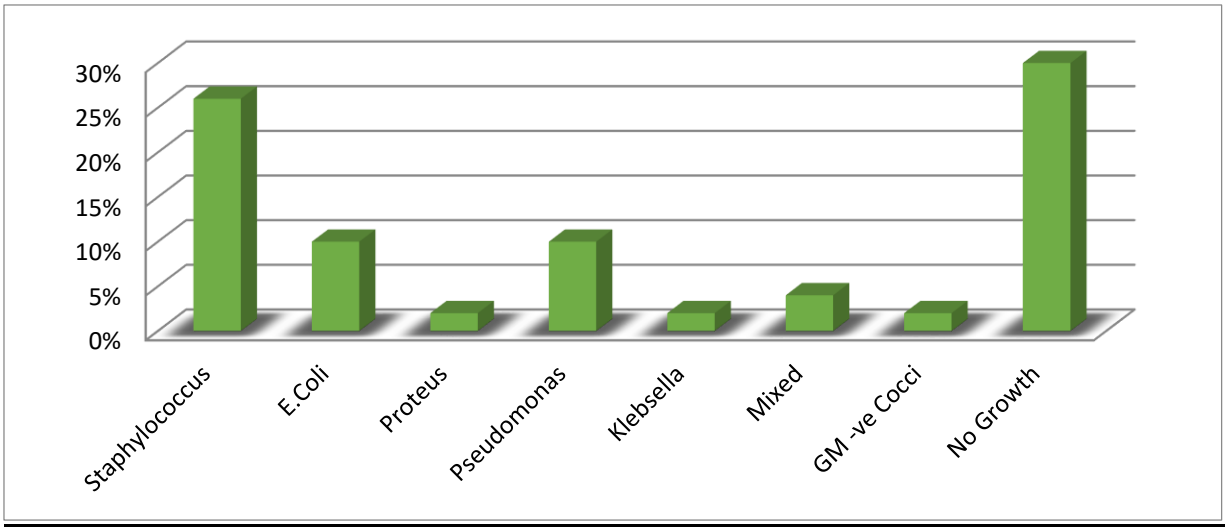
Diabetic foot lesions were more common in patients with poor blood glucose control. 27(54%) Patients with poor blood glucose control(>300 mgl dl)were vulnerable for amputations .

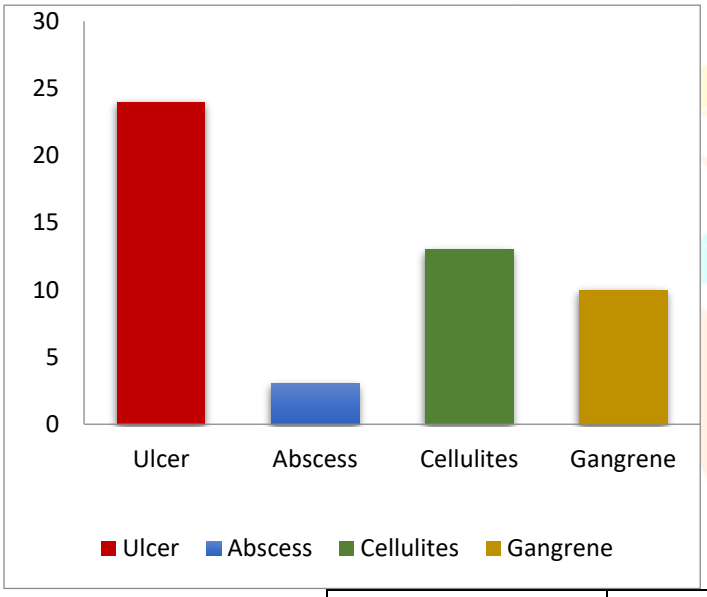
Control	Number of patients	Amputations
Good (<200 mg/dl)	10	1(2%)
Fair (200-300 mg/dl)	13	3(6%)
Poor(>300 mg/dl)	27	12(24%)



6(12%) dorsalis pedis artery and 6(12%) tibial artery were commonly involved and one patient had absent poplitial pulsation needed above knee amputation.(Following pulsations were absent)

In this series, pus, either from abscess or from the floor of ulcer, was sent for culture and sensitivity in all patients. In most patients, more than one organism was grown on culture. Staphylococci (26%) were the commonest organism.





Different types of lesions included cellulitis; abscess, ulcer and gangrene are seen in this series. Most of the patients present with more than one lesion. Only common lesions are considered here. Ulcer was the common lesion seen here which was present in 24(48%) patients while abscess seen in 3 (6%) patients, was the least common lesion.

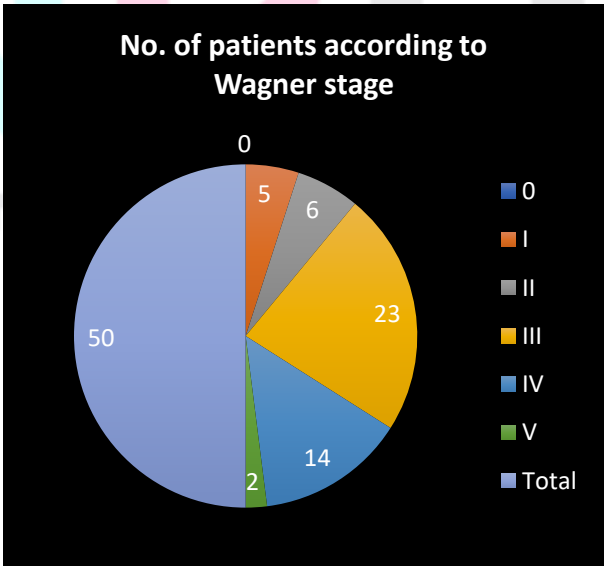
Almost all patients need insulin for blood sugar level control. 35(70%) patients had reduced requirement of insulin for control of blood sugar after one week

	Decreased	Increased	Same
No. of patients	35(70%)	10(20%)	5(10%)

Insulin requirement decreased within one week after control of infection.

Wagner's staging in 50 patients of diabetic foot

Wagner's Stage	No of patients	Percentage
0	0	0
I	5	10%
II	6	12%
III	23	46%
IV	14	28%
V	2	4%
Total	50	100

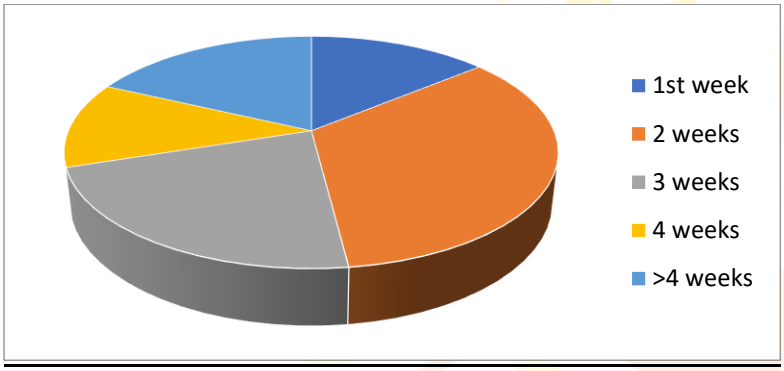


8(16%) patients were detected as impaired blood flow in peripheral vessels . 3(6%) patients showed complete stenosis and 5(10%) patients showed partial stenosis . these patients are prone to amputation.

Treatment given	No. of cases
Dressing	**19(38%)**
Dressing & Split skin graft	**03(6%)**
Debridement	**08(16%)**
Incision & drainage	**04(8%)**
Toe amputation	**09(18%)**
Rays amputation	**03(6%)**
Tarso metatarsal amputation	**01(2%)**
Symes amputation	**01(2%)**
Below knee amputation	**01(2%)**
Above knee amputation	**01(2%)**

Surgical management included procedures like incision and drainage, debridement, skin grafting and amputations. Commonest surgical intervention was dressing and debridement, which was carried out in about 34 (68%) patients. 16 (36%) patients had undergone amputations. In this study, 1 (2%) patients underwent below knee amputation, 14 (28%) patients underwent minor amputations and 1 (2%) patients above knee amputation.

the present series, the hospital stay extended from 1-4 weeks. Hospital stay ranged from 1-3 weeks in majority of patients



Average period of recovery was 2 to 3 week

DISCUSSION

Fifty cases of diabetic foot were studied from March 2022 to December 2023. It was seen that patient attending the hospital present fairly late with extensive chronic and destructive lesion on their feet was a common occurrence.

In the present series the maximum incidence of foot lesion was in the 6th decade. Baddiley and Fulford (1965)[10] recorded a maximum incidence in the 7th dacade while Oakley[7] found that the maximum incidence was in the 8th decade. Otto kahn and William Wagner found the average age was 59.5 years.[8]

Bell E.T. found gangrene 156 times more common in the diabetic than nondiabetic in 5th decade, 85 times more common in 6th decade, 53 times more common in 7th decade[5].

Male female ratio in diabetic foot in the present series was 1:1.5. Bell[5] has reported an incidence of 2:1. However Otto Kahn[8] reports a higher incidence in females than males. Martin J. Silverstein and Lawrence Kadish found higher incidence in men than women 1.2:1[11].The duration of diabetes could not be well correlated in our series due to the fact that more than50% of our patients were diagnosed as diabetes when they presented with foot lesion.

Low socio-economic status and illiteracy are chief factor for late diagnosis of disease in our country. Patients do not attend hospital unless they are truly incapacitated. Baddiley and Fulford (1965)[10] and Catterall[12] reported that duration of diabetes has no definite correlation with foot lesion.

Infections are frequent problems. They are also the major cause of morbidity. Exact mechanism of this increased susceptibility to the infection is not clearly understood.

Study	Commonest organism grown on culture
Jones et al[13]	Staphylococcus > 40%
Lipsky et al[14]	Staphylococcus > 50%
PRESENT STUDY	Staphylococcus- 40%

In our series, pus was sent for culture and sensitivity in all patients. In most of the patients, more than one organism was grown on culture.Staphylococcus aureusli(40%) is the most common organism isolated from lesions of "diabetic foot".,which were compared with Jones et al[13](1985) & Lipsky et al[14] (1990).

Also the series of Otto Kahn & Wiliam Wagner study, organisms isolated were consistent with our series[8].

In majority of the lesion mixed flora was seen. This may be due to surface contamination of the wounds by other organisms.

Staphylococcus being the most common causative organism higher antibiotic like Amoxicillin & Clavalunic acid & amino glycosides like Amikacin or Gentamycin added with metronidazole,clindamycin or vancomycin were given for control of infections[18]

In our series, all patients had evidence of infection as shown by culture and sensitivity of pus. The cases were maintained on insulin.and antibiotics according to culture, in 35 cases requirement of insulin decreased with the control of infection, but in 5 patients it remained unchanged. Therefore it can be said that diabetes and infection act on each other in a detrimental manner. Once the infection has flared up, control of diabetes become very difficult. Vigorous attempts to control infection give gratifying results in controlling diabetes and thus decrease complication.

Total 50 cases of diabetic foot were studied. These cases are presented when there was significant ulceration(48%), abscess formation(06%), cellulitis(26%) and gangrene(20%), thus unless there was breach in continuity of skin surface or infection, which interferes with the function of foot, patients were reluctant to attend hospital and take proper treatments. It was mainly due to ignorance and illiteracy. The custom of walking barefoot also increases the susceptibility to trauma with further progress in lesion.

Barker W.F. [15](1971) noted that common pattern of diabetic sepsis is the deep plantar abscess. With the slightest trauma with wound infection in the foot the patients get off their feet and lie in the bed with their toes pointing upwards. In this posture the septic focus can not be drained properly and often pus gravitates along the tendon sheaths and deeper tissue planes of foot. Associated pressure necrosis and thrombosis may results in extensive tissue loss, which in turn leads to formation of deep plantar abscess.. Gangrene of toes was next common lesions only preceded by deep plantar abscesses, thus it is the most distal part of the vascular tree which is compromised first.

Type of lesion	PRESENT STUDY	Kao Hsiung et al
Ulcer	**48%**	**75.0%**
Cellulites	**26%**	**78.8%**
Gangrene	**20%**	**68.0%**
Abscess	**6%**	**12.5 %**

Due to unaffordability of the patient, Doppler done only in cases with clinically absent peripheral pulsations,In 5(10%) patients complete stenosis of dorsalis pedis & posterior tibial artery and in 8(16 %) patients partial stenosis of dorsalis pedis & posterior tibial artery. Total 13(26%) patients had decresed blood flow in posterior tibial and dorsalis pedis artery.

These findings varied with the different studies A.L.Bahl (29.0%), D.K.Rastogi (44.3%), A.K.Ramani et a(49.35%)[9,19,16.]

Debridment with or without amputation is definitive procedure in these cases where blood flow is good. This procedure may also be undertaken as a preliminary in presence of fulminant infection. Later a definite surgical procedure may be undertaken once the infection has been properly controlled. This may possibly lower the level of amputation and certainly has a faster healing rate. Minor areas of necrosis in neuropathic foot over the angular bony prominence can be permitted to demarcate and separate on its own.

Out of 10 cases presented with gangrene, one had undergone below knee amputation due to unsalvageable limb, one was converted to above knee amputation due to uncontrolled infection. One patient had palpable posterior tibial artery & so Syme's amputations was carried out. Good wound healing was seen in all cases.

Wagner's Grades compared with the other study

Grade	Calhoun J H et al [17] (729 cases)	Present study (50 cases)
0	39 (5.35%)	0 (0.0%)
I	154 (21.12%)	5 (10%)
II	64 (8.78%)	6 (12%)
III	251 (34.43%)	23(46%)
IV	189 (25.93%)	14 (28%)
V	**32 (4.39%)**	**2 (4%)**

In the present study, maximum no. of patients presented with Wagner's grade III diabetic foot and there were no patients with grade '0' and few patients with grade 'I'. Results were compared with Calhoun J H et al study[17].

CONCLUSION

Diabetic foot lesions are significant health problems at some time in the life of diabetic patients .It commonly results from a combination of neuropathy, vasculopathy and infection in lower extremity . Proper evaluation and control of risk factors like habits of walking barefoot ,smoking,alcohol, poor blood glucose control ,anemia and lack of preventive foot care lead the forthcoming complications needing some sort of amputation .Setting up a multidisciplinary foot care team has been found to be accompanied by a drop in the number of amputations .

“Care your feet as your face or you will burn your feet before your face.”

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