



PROSPECTIVE STUDY ON CLINICAL- MICROBIOLOGICAL & OUTCOME EVALUATION OF DIABETIC FOOT

General Surgery

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ABSTRACT

The diabetic foot disease is one of the most expensive complications of diabetes and one of the most frequent causes of hospitalization. Even though lot of studies were there in diabetic foot ulcer, local demographic status of Diabetic foot ulcer, in correspondence with aetiology, microbiological profile to be studied here. In this Clinical and microbiological study of Diabetic Foot, cases were studied in Mahatma Gandhi Medical College, Pondicherry for a period of one and half years . The various presentations of Diabetic foot, like ulceration, resistant deep infections, cellulitis, and severe ischemia leading onto gangrene percentage of surgical intervention ,like debridement, minor/major amputations were studied and the results were found to be comparable to other studies in all aspects except the gender distribution which shows frequent involvement in males

KEYWORDS

INTRODUCTION :

A majority of patient with diabetes around 15% during their course of illness at one point of time or other presents with foot ulcer. The diabetic foot disease is one of the most expensive complications of diabetes and one of the most frequent causes of hospitalization. frequency, various types and causes of diabetic foot lesions can assess the severity of the disease, and the way the injury and infection contribute to it.

The diabetic foot lesions are due to many factors, some of them are Diabetic neuropathy, Diabetic angiopathy, poor glycemic control and supper added infections Diabetic foot ulcer results from neuropathy and ischemia of the foot.

Even though lot of studies were there in diabetic foot ulcer, local demographic status of Diabetic foot ulcer, in correspondence with aetiology, microbiological profile to be studied here.

In this Clinical and microbiological study of Diabetic Foot, cases were studied in Mahatma Gandhi Medical College, Pondicherry for a period of one and half years.

AIMS AND OBJECTIVES :

To assess the various presentations of Diabetic foot, like ulceration, resistant deep infections, cellulitis, and severe ischemia leading onto gangrene.

To study percentage of surgical intervention ,like debridement, minor/major amputations.

SUBJECTS AND METHODS :

Prospective Observational study done in Mahatma Gandhi medical college and research institute hospital, Pondicherry.

All patients satisfying the inclusion criteria [all the patients who present with a known history of diabetes and diagnosed diabetic on admission with a diabetic foot] were subjected to thorough history taking then clinical evaluation involving examination of peripheral sensory system, peripheral arterial pulse examination, radiological evaluation and pus or wound swab culture sensitivity. Patients with

compromised arterial supply were subjected to Doppler / duplex ultrasonography. Depending upon the findings, patient were subjected to either conservative or surgical line of management and response evaluation to treatment, data was collected and analysed statistically. Patients with venous ulcers ,congenital vascular and nerve degenerative disorder were not included in this study. Statistical analysis was carried out using SPSS version 19.0 (IBM SPSS, US) software with Regression Modules installed.

Descriptive analytical study was used to analyse the data

RESULTS

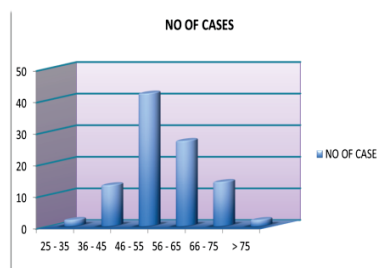
AGE DISTRIBUTION:-

Most of the diabetic patients were in the age group of 46-55 years (42%). The youngest was 35 years who came with non-healing ulcer in the right foot and the eldest was 77 years who came with non healing ulcer of the left foot. See [table.1] and [fig.1]

Table.1

Age	Number of cases	Percentage
25-35	2	2%
36 – 45	13	13 %
46 – 55	42	42 %
56 – 65	27	27 %
66 – 75	14	14 %
> 75	2	2%
Total	100	100 %

fig.1

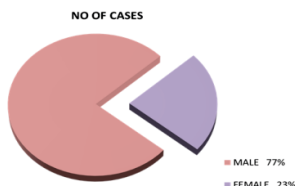


SEX DISTRIBUTION

Out of 100 cases studied, there was a male predominance in occurrence of diabetic lesions. 77% were male patients and 23% were female patients. See [table.2] and [fig.2]

Table.2

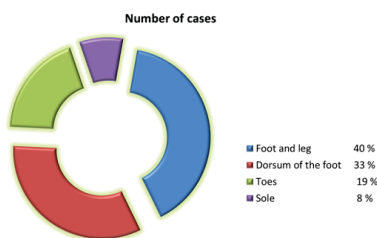
Sex	Number of cases	Percentage
Male	77	77 %
Female	23	23 %
Total	100	100 %

Fig.2**SITE OF THE LESION :-**

The most common site of presentation of a diabetic patient with a foot lesion was extensive lesion involving foot and leg which was about 40%; sole involvement was seen in 8% of the patients; toe involvement was seen in 19 % and 33 % presented with lesion in the dorsum of the foot. See [table.3] and [fig.3]

Table.3

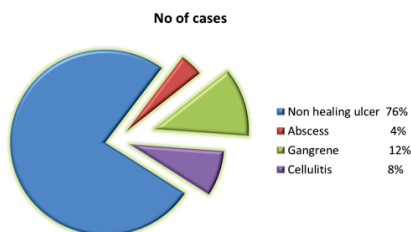
Site of lesion	Number of cases	Percentage
Foot and leg	40	40
Dorm of foot	33	33
Toes	19	19
Sole	8	8
Total	100	100

Fig. 3**TYPE OF LESION :-**

Most common presentation was non healing ulcer in 76% of cases followed by Gangrene in 12 % of patients. Cellulitis was seen in 8 % of patients and abscess was seen in 4 % of patients. See [table.4] and [fig.4]

Table.4

Lesion	Number of cases	Percentage
Non healing ulcer	76	76
Abscess	4	4
Gangrene	12	12
Cellulitis	8	8
Total	100	100

Fig. 4**MICRO BIOLOGICAL STUDY:**

Out of 100 cases, 121 microorganisms are reported and 21 cases showed polymicrobial culture sensitivity. Staphylococcus aureus, klebsiella species and pseudomonas aeruginosa were the most common cause of diabetic foot infection.

Table. 5

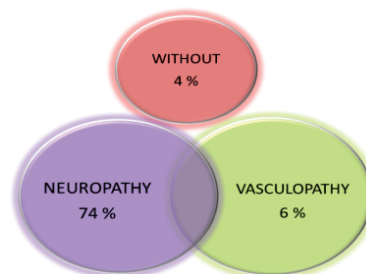
Micro organism	No of cases	Percentage
Staphylococcus aureus	25	20.6%
Klebsiella species	19	15.7%
Pseudomonas aeruginosa	18	14.8%
E.coli	12	9.9%
Proteus vulgaris	12	9.9%
Enterococcus species	6	4.9%
MRSA	6	4.9%
Proteus mirabilis	4	3.3%
Coagulase negative staph. Aureus	4	3.3%
Streptococcus pyogenus	4	3.3%
Candida	2	1.6%
Coliform	1	0.8%
Acinetobacter species	1	0.8%
Non fermenting gram negative bacilli	2	1.6%
sterile	3	2.4%
Citrobacter	2	1.6%
Total	121	100%

PATHOLOGY OF THE DIABETIC FOOT :-

Out of 96 cases whose pathology was identified, majority of the patients had neuropathy that is 74% patients; 6% patients had vasculopathy and 16% had both. In 4% patient's pathology couldn't be identified. See [table.6] and [fig.6]

Table.6

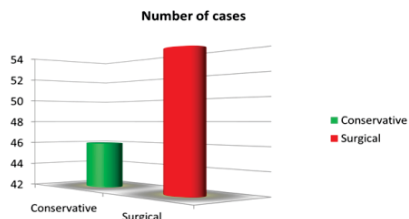
Pathology	Number of cases	Percentage
Neuropathy	74	74 %
Vasculopathy	6	6%
Both	16	16 %
No neuropathy / vasculopathy	4	4%
Total	100	100%

Fig.6**TREATMENT :-**

Out of 100 cases studied 54 cases that is 54% of patients were treated surgically and 46 cases that is 46% were treated conservatively with wound debridement and dressing without any kind of amputation or grafting. See [table.7] and [fig.7]

Table.7

Treatment	Number of cases	Percentage
Conservative	46	46 %
Surgical	54	54 %
Total	100	100 %

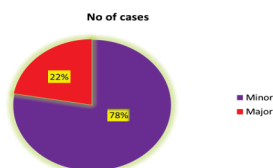
Fig.7**TYPES OF OPERATION :-**

Out of 54 cases who underwent surgical intervention, 42 patients; that is 78% underwent minor surgical procedures which includes fasciotomy, skin grafting, disarticulation and transmetatarsal amputation. Whereas 12 patients, that is 22% underwent major surgical procedures such as below knee/above knee amputation. See [table.8] and [fig.8]

Table. 8

Operation	Number of cases	Percentage
Minor	42	78 %
Major	12	22 %
Total	54	100 %

Fig.8



DISCUSSION :

The most common period in the study during which the patient presented with diabetic foot lesion was between 46-55 years, which is the period in Mayfield JA et al study though percentage of cases differed to some extent. This study indicates that a diabetic foot complication usually occurs in the elderly. Like Mayfield JA et al study, the present study had more number of male patients (77) suffering from diabetic foot lesions than females (23). The present study had ratio of male: female as 3:1 whereas in Mayfield JA et al study male:female ratio was almost equal.

The present study had extensive involvement of the foot and leg 40 patients, whereas in Alpqvist J study the most common site of involvement was toes in 51 patients.

Like Queri FA, non-healing ulcer was the most common presentation, 76 (76%) patients. It is comparable to other study.

Like Margolis DJ study, the present study shows neuropathy as the most common pathology for the development of diabetic foot. So, it is comparable with the other study.

Most of the cases were treated surgically with 54 patients undergoing operations and 46 were treated conservatively. This is comparable with Muquim RU and Khan AH study although percentage varied. The reason being report of more number of patients in the early stages of the diabetic foot because of more awareness in recent times. Out of 54 cases undergoing operative intervention in the present study, 42 (78%) patients underwent minor surgical procedures, which included fasciotomy, skin grafting, disarticulation, trans metatarsal amputation, and 12 (22%) patients underwent major Operations which included below knee or above knee amputations. This is comparable with the Muquim RU and Khan AH studies.

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 because of the various pathologies involved like neuropathy, vasculopathy or both. Neuropathy is 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 it is advised to avoid trauma to the foot, use foot wear and maintain satisfactory control of diabetes mellitus

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