

An Approach to Diagnosis and Management of Diabetic Foot in The Indian Population

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Abstract

Introduction: The problem of the Diabetes is worldwide, and India is one of the major countries affected by it. One such common example seen among diabetics is Diabetic foot ulcer which affects nearly 12 % of the patients and one of the major causes of morbidity among them. Treatment includes thorough wound management, good microbiological control using appropriate antibiotics and strict glycemic control and lifestyle changes. Many recent approaches like vacuum dressing, platelet derived growth factors, larval therapy have revolutionized the management of diabetic foot. Hence the present study has been undertaken to evaluate modes of presentation and management protocols and predisposing factors in diabetic foot. **Methodology:** An observational and prospective Hospital based Study was conducted in a Tertiary care hospital from January 2019 to June 2019. A total of 50 patients with Diabetes Mellitus and suffering from diabetic foot ulcer admitted in the department of surgery were included in the study. Ethical clearance was taken from Institutional Ethical Review Board. Data was entered in Microsoft Excel and analysed using SPSS v20 for frequencies, mean, SD and chi square test. **Results:** A total of 50 patients were included in the study. The age of the patients ranged from 45 to 78 years in our study. The mean age was 62±12.7 years. The males were 35 (70%) and 15 (30%) females. The Cellulitis (40%) was the most common modes of presentation of the diabetic foot ulcer in our study followed ulcer presentation (36%), abscess seen in 9 (18%) cases and gangrene in 6% of cases. **Conclusions:** Diabetic patients have always suffered from complications affecting the lower limbs. If foot complications are detected early, it can reduce the chances of amputation. Education regarding foot care and early signs of neuropathy play a vital role in the prevention of recurrence.

Keywords: Diabetic Foot, Management, diabetes mellitus.

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Introduction

Diabetes is the most common endocrine syndrome which affects the multisystem in the human Body. It affects the vascular, endocrine, neuropathic, Cardiovascular and even the nephrotic system in the human body. The problem of the Diabetes is worldwide, and India is one of the major countries affected by it. The causes of Diabetes in India are multifactorial ranging from the genetic to idiopathic. The food habits, cultural habits and lifestyle of the people in the subcontinent make them the most susceptible population for the diabetic in the world[1].

In India, 65 million people have diabetes in 2013; by 2035 this will rise to 109 million. The number of people with type 2 diabetes is increasing in every country. 80% of people with diabetes live in low- and middle-income countries the greatest number of people with diabetes is between 40 and 59 years of age[2-4]. In 2012, 60% of all deaths in India were due to non-communicable diseases and diabetes contributes 2% of it[5].

About 50% of people with diabetes mellitus are unaware of their condition. Approximately 25% of all patients with diabetes undergoing surgery are undiagnosed on admission to hospital. Patients with diabetes have a higher risk of certain diseases like cardiovascular disease, stroke etc[6].

One such common example seen among diabetics is Diabetic foot ulcer which affects nearly 12 % of the patients and one of the major causes of morbidity among them. The development of Diabetic foot ulcer is seen in both types of patients who are on regular treatment and irregular treatment but the outcome of it is bad in the former. The cause of diabetic foot ulcer is multifactorial, due to involvement of vascular system, neuropathies, poor control of diabetes and infection of the ulcer by bacteriae[7].The diabetic foot can be divided into the neuropathic foot and ischemic foot. The first one is due to neuropathy and the second one is due to occlusive vascular diseases. There is increase in incidence of diabetes and its complications mainly foot ulcers, skin and soft tissue infections, surgical site infections, peripheral vascular disease leading to amputation, Charcot neuroarthopathy, ankle ulceration with osteomyelitis and fracture of ankle bone etc. in rural population as compared to earlier in urban population[8].Treatment includes thorough wound management, good microbiological control using appropriate antibiotics and strict glycemic control and lifestyle changes[9]. Many recent approaches like vacuum dressing, platelet derived growth factors, larval therapy have revolutionized the management of diabetic foot. Hence the present study has been undertaken to evaluate modes of presentation and management protocols and predisposing factors in diabetic foot.

Objectives

1. To assess the various modes of clinical presentation, diagnosis and management of diabetic foot among patients attending a tertiary care hospital.

Methodology

An observational and prospective Hospital based Study was conducted in a Tertiary care hospital from January 2019 to June 2019.

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A total of 50 patients with Diabetes Mellitus and suffering from diabetic foot ulcer admitted in the department of surgery were included in the study.

All the patients with Diabetes mellitus having foot infections and ulcerations admitted in the surgical ward and also referred from the other specialty departments were included. The data regarding demographic details of patients, detailed clinical history, clinical examination, diagnosis, investigations, surgical procedures were collected in a specially designed case recording format. Patient with Foot ulcers without Diabetic and those who were not willing to

participate in the study were excluded. Ethical clearance was taken from Institutional Ethical Review Board. Data was entered in Microsoft Excel and analysed using SPSS v20 for frequencies, mean, SD and chi square test.

Results

A total of 50 patients were included in the study. The age of the patients ranged from 45 to 78 years in our study. The mean age was 62±12.7 years. The males were 35 (70%) and 15 (30%) females.

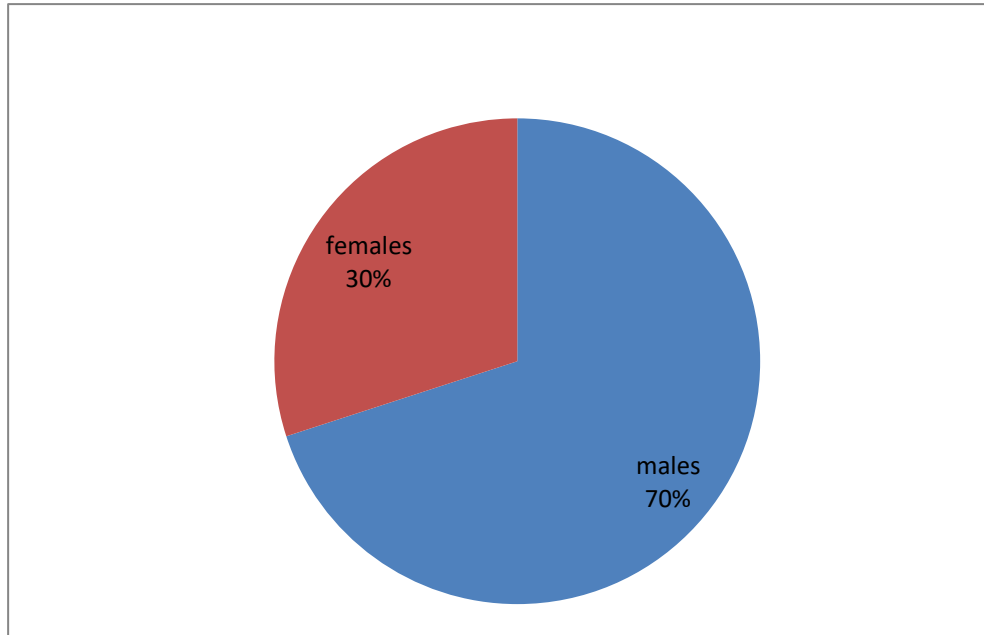


Fig 1:Gender distribution

The Cellulitis (40%) was the most common modes of presentation of the diabetic foot ulcer in our study followed ulcer presentation (36%), abscess seen in 9 (18%) cases and gangrene in 6% of cases.

Nearly 39(78%) of the cases had some of the predisposing factors for the diabetic ulcer of the foot. The most common site of Diabetic foot ulcer was the sole 21 (42%) followed by toes 17 (34%). Most of the patients had duration of diabetes of 5 – 10 yrs (40%) followed by >10 yrs of duration (34%) as shown in table 1.

The involvement of peripheral Vascular Disease and neuropathy were seen in 12 (24%) cases each and 18(34%) of them presented with both

the vascular and nervous systems involved. Osteomyelitis was seen in 8(16%) cases. Table 2 shows the various treatment modalities employed in our study. Slough Excision with regular dressing was done in 31 (62%) cases, I and D Fasciotomy was done in 12 (24%) cases. Other less common treatment modalities were Tarsal tunnel release, Disarticulation and Below Knee amputation. The levels of HbA1C more than 7 mg % was seen in nearly 85% of the case showing poor glycemic control. Mean duration of hospital stay was 24.5±13.4 days and ranged from 12 – 43 days.

Table 1: Clinical presentation of study participants (n=50)

Clinical presentation	Number	Percent
Mode of presentation		
Cellulitis	20	40
Ulcer	18	36
Abscess	9	18
Gangrene	3	6
Predisposing factor		
Present	39	78
Absent	11	22
Site of lesion		
Sole	21	42
Toes	17	34
Dorsum	12	24
Duration of diabetes		
Newly detected	8	16
< 5 yrs	5	10
5 – 10 yrs	20	40
>10 yrs	17	34
System involved		
Neuropathy	12	24
Peripheral vascular disease (PVD)	12	24
Osteomyelitis	8	16
Both neuropathy &PVD	18	36

Table 2: Treatment modalities used among study participants (n=50)

Treatment	Number	Percent
Slough excision, regular dressing & SSG	31	62
I & D fasciotomy	12	24
Tarsal tunnel release	4	8
Disarticulation	2	4
Below knee amputation	1	2

Discussion

The most common age group in our study was 40-50 yrs and the average age of the study population was 62 years, which was similar to a study in tertiary care hospital in AIIMS, Karnataka[10] which had 61 yrs and to another study done at JOS University where the mean was 63.2 years[11]. The male predominance of the disease was seen in our study which was also seen in the other studies done by JOS University, AIMS, Karnataka[10] and study done by Diabetic Research Centre, Chennai was also comparable to our study findings[12].

The site of lesion of Diabetic foot ulcer in our study which said the sole of the foot is the major region affected by foot ulcer in diabetic patients followed by dorsum and toes of the foot. The study area being the rural and walking bare foot by the people in the field areas by the farmers and the subsequent development of the neuropathy among diabetic patients which alter the sensation of the soles may be the reasons. But in the study done by Apelquist et al and Reiber et al series where toes of the foot were the most common site of lesions[13,14]. The duration of diabetic is an important factor for the occurrence of diabetic foot ulcer. Any complication caused by diabetes is always related to the duration of diabetics. In the study done by James S, Seattle series 10 study also showed that more the duration of diabetes more the complication of diabetic foot ulcer. The similar findings were seen in the present study also. The diabetic foot complications are known to occur due to lack of strict glycemic control[15]. The commonest vascular system involved will be tibial arteries leading to the atherosclerosis and decreased blood flow which will result in decreased delivery of blood flow and oxygen delivery and even the antibiotics which will affect the healing process. These are the reasons for common complications like neuropathy and PVDs among diabetics. These complications were also seen in the present study which was comparable to the study of Apelquist et al, and JOS University[11,13]. The surgical treatment modalities followed in the present study were similar to the study findings of various articles where similar surgical modalities were followed by various studies[11,12,15], while a study done by Tanzanian university reported majority of their patients underwent lower limb amputation[16]. Mean duration of hospital stay in the present study was 24.5±13.4 days, while it was 36.24 ± 12.62 days in the Tanzania study[16]. Patient education in foot care, prophylactic skin and nail care, and footwear reduces the risk for foot ulcers and lower limb amputation by 25% in those patients with no specific risk factor[17].

Conclusion and Recommendation

Diabetic patients have always suffered from complications affecting the lower limbs. Foot infection and the subsequent amputation of a lower extremity are the most common causes of hospitalization among diabetic patients. The duration of diabetes and presence of predisposing factors and late presentation to the hospital were major factors to the occurrence of foot ulcers. If foot complications are detected early, it can reduce the chances of amputation. Education regarding foot care and early signs of neuropathy play a vital role in the prevention of recurrence. All the patients were educated for regular checkups, change in lifestyle for good control of diabetes and foot care so that the complications which lead to poor prognosis and loss of parts etc. can be avoided in the future.

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