

Original Research

Study of Profile of Diabetic Foot Ulcers Among Diabetics at a Tertiary Care Centre

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Abstract:

Background: Diabetes mellitus (DM) is common throughout the world but is more common (especially Type 2) in the more developed countries. Early detection of peripheral neuropathy and patient's education regarding foot care and footwear is crucial in reducing the risk of any injury that can lead to ulcer formation. The study was conducted to assess the profile of diabetic foot ulcers among diabetics at a tertiary care centre.

Material and methods: A total of 100 patients with presence of diabetic foot ulcer were enrolled. Complete demographic and clinical details of all the patients were obtained. Demographic details, duration of diabetes, history of smoking and trauma, body mass index, and presence of hypertension were recorded for all patients. Blood samples were obtained and glycaemic profile of all the patients was recorded. All the results were recorded in Microsoft excel sheet and was subjected to statistical analysis using SPSS software.

Results: Majority proportion of patients belonged to the age group of more than or equal to 50 years. 61 percent of the patients were males while hypertension was seen in 33 percent of the patients. Mean BMI was found to be 27.3 Kg/m². Mean duration of diabetes was found to be 9.3 years. Dyslipidaemia was seen in 41 percent of the patients. Color doppler findings were abnormal in 19 percent of the patients.

Conclusion: The majority of DFU-related risk factors are avoidable or manageable, and there is a chance to treat and prevent foot ulcers at an early age. A targeted effort is needed to inform patients and primary healthcare providers about risk factors and to raise awareness of the importance of foot care and its practice among India's rural and urban populations as a preventative measure.

Keywords: Diabetic foot, Ulcer, Diabetes

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INTRODUCTION

Diabetes mellitus (DM) is common throughout the world but is more common (especially Type 2) in the more developed countries. The Indian diabetic population is expected to increase to 57 million by the year 2025.¹ Diabetic foot ulcers (DFUs) are associated with significant morbidity and mortality, yet they are one of the most preventable long-term complications of DM. Early diagnosis and presentation to hospital for prompt treatment of DFU is capable of reducing the significant morbidity and mortality associated with this

condition.² Early detection of peripheral neuropathy and patient's education regarding foot care and footwear is crucial in reducing risk of any injury that can lead to ulcer formation.^{3,4}

The lifetime incidence may be as high as 25%.³ Despite the efforts of conservative therapy, there will always be a percentage of ulcers that necessitate hospitalization. These cases may require surgical debridement, resection of distal osseous and soft tissue structure, endovascular intervention, daily dressings, strict glycemic control, and intravenous antibiotic therapy for

eradication of infection.^{4,5} Foot problems in diabetics can frequently be life or limb threatening, yet have not received the same level of attention as other diabetes complications.⁶ Until today, descriptive data regarding demographical and clinical factors in foot ulcers among diabetic patients in Indonesia are relatively few though we are all aware of its clinical importance.^{7,8} This study was conducted to assess the profile of diabetic foot ulcers among diabetics at a tertiary care centre.

MATERIAL AND METHODS

The present study was conducted for assessing the profile of diabetic foot ulcers among diabetics at a tertiary care centre. A total of 100 patients with presence of diabetic foot ulcer were enrolled. Complete demographic and clinical details of all the patients were obtained. Inclusion criteria for the present study included all consecutive patients with diabetic foot ulcer which reported to hospital. Patients with history of any other systemic illness, or any known drug allergy were excluded from the present study. Demographic details, duration of diabetes, history of smoking and trauma, body mass index, and presence of hypertension were recorded for all patients. Blood samples were obtained and glycaemic profile of all the patients was recorded. All the results were recorded in Microsoft excel sheet and was subjected to statistical analysis using SPSS software.

RESULTS

A total of 100 patients with DFU were enrolled. The mean age of the patients was 53.9 years. The majority of patients belonged to the age group of more than or equal to 50 years. 61 percent of the patients were males while hypertension was seen in 33 percent of the patients. Mean BMI was found to be 27.3 Kg/m². Mean duration of diabetes was found to be 9.3 years. Dyslipidaemia was seen in 41 percent of the patients. Color doppler findings were abnormal in 19 percent of the patients.

Table 1: Demographic data

Variable		Number	Percentage
Age group	Less than 50	37	37
	More than or equal to 50	63	63
	Mean age (years)	53.9 years	
Gender	Males	61	61
	Females	39	39
Mean BMI (Kg/m ²)		27.3	
Hypertension	Present	33	33
	Absent	67	67

Table 2: Duration of diabetes

Duration of diabetes (years)	Number
Mean	9.3
SD	7.2
Median	9
Minimum	4
Maximum	19

Table 3: Occurrence of dyslipidaemia

Dyslipidaemia	Number	Percentage
Present	41	41
Absent	59	59
Total	100	100

Table 4: Color Doppler findings

Color Doppler findings	Number	Percentage
Normal	19	19
Abnormal	81	81
Total	100	100

DISCUSSION

Diabetes in India with more than 62 million diabetic population, is rapidly gaining status of a potential epidemic.⁹ Prevalence of diabetes in India differs according to region varying from 5.3% in central India to 13.6% in Northern India.¹⁰ Since diabetes is not a notifiable condition its actual burden is unknown and there may be underestimation of burden of diabetes in India.¹¹ Foot ulceration is one of the most common complication of diabetes, estimated affecting 15% of diabetic patients during their lifetime. Prevalence of DFU ranges from 4% to 10% and most common cause of morbidity and mortality in (DFU) is infections, which are seen in 40%–80% of the cases.¹² Initially antimicrobials are selected empirically for treatment of DFU infections. With declining number of novel antibiotics being developed and impetuous use of available antibiotics, antibiotic resistance has become a universal issue in healthcare institutions.¹³ Diabetic nephropathy which occurs in approximately third of diabetic patients and increasing incidence of multi drug resistant infections in DFU compounds the challenge faced by clinicians in treating these patients.¹⁴

It is still not clearly understood which factors play a major role in diabetic foot ulcer patients undergoing major limb amputations¹⁵⁻¹⁷ nor what role neuropathy, peripheral vascular disease, and ulcers each play in pathophysiology of major limb amputations. Documented risk factors do not clearly distinguish those contributing to minor or major limb amputation. However peripheral neuropathy, ulceration, infection, and peripheral vascular disease¹⁸, ischaemic ulcers occurring early in diabetics have been identified as

principal factors with male sex, size of ulcer, diabetic nephropathy, previous ulcer history, hypertension status, poor glycemic control and dyslipidemia also playing a role in amputation of diabetic ulcers.¹⁶⁻¹⁸ This study was conducted to assess the profile of diabetic foot ulcers among diabetics at a tertiary care centre.

A total of 100 patients with DFU were enrolled. The mean age of the patients was 53.9 years. The majority of patients belonged to the age group of more than or equal to 50 years. 61 percent of the patients were males while hypertension was seen in 33 percent of the patients. Mean BMI was found to be 27.3 Kg/m². Mean duration of diabetes was found to be 9.3 years. Dyslipidaemia was seen in 41 percent of the patients. Color doppler findings were abnormal in 19 percent of the patients. In a previous study conducted by Nongmaithem M et al, authors assessed fifty patients of Diabetes with foot ulcer and two hundred without foot ulcers. Risk factors and clinical profile of patients were studied which included age, gender, duration of diabetes, BMI, smoking, random BSLs history, hypertension, glycated haemoglobin levels, lipid profile, history of loss of sensation and history of amputation. MNSI questionnaire and MNSI practical assessment for neuropathy were administered to diabetic patients along with a pre-structured questionnaire regarding foot care practices. In this study significant risk factors were peripheral neuropathy, peripheral vascular disease, gender, loss of sensation, duration of diabetes and smoking. MNSI questionnaire and practical assessment scores were higher in foot ulcer patients. Poor foot care practices were observed in patients with diabetic foot ulcer patients. Diabetic foot ulcers were more common in elderly males. Peripheral neuropathy, peripheral vascular disease, Smoking, trauma, duration of diabetes mellitus and high levels of glycated haemoglobin had significant association with occurrence of foot ulcers. MNSI scores had a high predictive value for development of foot ulcers amongst diabetics.¹⁹

In a similar study conducted by Pelayun TGD et al, authors determined the disease burden in terms of clinical profile and outcome of diabetic foot ulcer (DFU) admissions. Foot problems accounted for 16.2% of total diabetic admission (n = 1429). All patients had type 2 diabetes with no gender predominance. The mean age was 54.3 ± 8.6 years and diabetes control was very poor. Before admission, the ulcers had already developed for 4.7 ± 2.9 weeks; however, the majority of patients were unaware of the preceding causes. Ulcers were neuropathic in 42.2% of cases, neuroischemic in 29.9%, and pure ischemic at lesser percentage. More than 70% of ulcers were in Wagner grade ≥3 with infection event in nearly all patients. The most common isolates from culture were Gram-negative bacteria. A total of 98 (36.3%) lower extremity amputations

(LEAs) at various level of the foot were carried out, including major LEA in 24 patients and multiple amputations in seven patients. The mortality rate due to DFU reached 10.7%. Diabetic foot problems constitute a source of morbidity, a reason for LEA surgery as well as being a cause of death among patients with diabetes mellitus.²⁰ Alshammari, Z. J et al determined the knowledge, attitude, and practice to diabetic foot care among patients attending a diabetic clinic. 368 diabetic patients were surveyed, comprising 111 (30.2%) males and 257 (69.8%) females. About 282 (76.6%) patients had good knowledge of diabetic foot and foot ulcers. Only 41 (11.1) patients have attended a class on diabetic foot care, and 81 (22.0%) received education on diabetic foot care from a doctor and 38 (10.3%) from a nurse. The majority of them washed their feet daily (98.4%), 59.8% inspect shoes before wearing them, but less than half of the patients (47.6%) actually self-inspect their foot daily. Being married, having a secondary and university level of education, and being a government employee had significantly better knowledge of diabetic foot compared with their counterparts. There were no significant differences in the attitude toward diabetic foot and diabetic foot care across age groups. Patients with longer duration of diabetes (>5 years) significantly had better practice of diabetic foot care. Their study revealed a high percentage of the surveyed population with good knowledge and good practice of diabetic foot care, however with a poor attitude toward foot care.²¹

CONCLUSION

The majority of DFU-related risk factors are avoidable or manageable, and there is a chance to treat and prevent foot ulcers at an early age. A targeted effort is needed to inform patients and primary healthcare providers about risk factors and to raise awareness of the importance of foot care and its practice among India's rural and urban populations as a preventative measure.

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