

Evaluation of Incidence of Diabetic Foot Ulcers Among Diabetics: An Institutional Based Study

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ABSTRACT

Background: Diabetes is one of the most prevalent chronic diseases. It is estimated that diabetic foot ulcer (DFU) affects a significant proportion of diabetic population. The present study was conducted for assessing the incidence and profile of diabetic foot ulcer among diabetic patients.

Materials & Methods: A total of 500 patients with presence of type 2 diabetes were enrolled. Complete demographic and clinical details of all the patients were obtained. Incidence of diabetic foot ulcer was recorded. Assessment of patients with diabetic foot ulcer was separately done. Profile of patients with diabetic foot ulcer was also recorded. All the results were recorded in Microsoft excel sheet and were subjected to statistical analysis using SPSS software.

Results: The incidence of diabetic foot ulcer was 12 percent. Mean age of the patients with and without diabetic ulcer was 52.8 years and 43.5 years respectively (p-value < 0.05). Out of 60 patients with diabetic foot ulcer, majority were males. mean HbA1c levels among patients with and without diabetic foot ulcer was 10.9 and 8.8 respectively (p-value < 0.05). Mean duration of diabetes among patients with and without diabetic foot ulcer was 10.7 years and 7.3 years respectively (p-value < 0.05). Positive family history of diabetes was present in 55 percent and 18.18 percent of the patients with and without

diabetic foot ulcer.

Conclusion: Diabetic foot ulcers were more common in elderly males with higher duration of diabetes and higher HbA1c levels. Awareness regarding foot care was poor which underlines the need to promote practice of foot care amongst diabetic population.

Key words: Diabetes, Diabetic foot, Ulcer.


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INTRODUCTION

Diabetes is one of the most prevalent chronic diseases: in 2010, one study reported that 285 million adults worldwide had diabetes and this figure is projected to rise to 439 million by the year 2030. Such a profound demographic shift is likely to yield a corresponding increase in the prevalence of diabetes chronic complications, including those in the lower extremity, the diabetic foot. It is estimated that the annual population-based incidence of a diabetic foot ulcer (DFU) ranges from 1.0% to 4.1%. The lifetime incidence may be as high as 25%. 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 glycaemic control, and intravenous antibiotic therapy for eradication of infection.¹⁻³

DFU is considered a major source of morbidity and a leading cause of hospitalization in patients with diabetes. It is estimated that approximately 20% of hospital admissions among patients with DM are the result of DFU. Indeed, DFU can lead to infection, gangrene, amputation, and even death if necessary care is not provided. On the other hand, once DFU has developed, there is an increased risk of ulcer progression that may ultimately lead to amputation. Overall, the rate of lower limb amputation in patients with DM is 15 times higher than patients without diabetes. It is estimated that approximately 50%-70% of all lower limb amputations are due to DFU. In addition, it is reported that every 30 s one leg is amputated due to DFU in worldwide.⁴⁻⁶ Hence; the present study was conducted for assessing the incidence and profile of diabetic foot ulcer among diabetic patients.

MATERIALS & METHODS

A total of 500 patients with presence of type 2 diabetes were enrolled in Department of General Medicine, Shadan Institute of Medical Sciences, Teaching Hospital & Research Centre, Himayatsagar Road, Hyderabad, Telangana, India. Complete demographic and clinical details of all the patients were obtained. Incidence of diabetic foot ulcer was recorded. Assessment of patients with diabetic foot ulcer was separately done. Profile of patients with diabetic foot ulcer was also recorded. All the results were recorded in Microsoft excel sheet and were subjected to statistical analysis using SPSS software. Chi-square test and student t test were used for evaluation of level of significance. P-value of less than 0.05 was taken as significant.

RESULTS

A total of 500 type 2 diabetic patients were analyzed. Diabetic foot ulcer was seen in 60 patients. Hence; the incidence of diabetic foot ulcer was 12 percent. Mean age of the patients with and without diabetic ulcer was 52.8 years and 43.5 years respectively (p -value < 0.05). Out of 60 patients with diabetic foot ulcer, majority were males. mean HbA1c levels among patients with and without diabetic foot ulcer was 10.9 and 8.8 respectively (p -value < 0.05). Mean duration of diabetes among patients with and without diabetic foot ulcer was 10.7 years and 7.3 years respectively (p -value < 0.05). Positive family history of diabetes was present in 55 percent and 18.18 percent of the patients with and without diabetic foot ulcer.

Table 1: Variable

Diabetic foot ulcer	Number	Percentage
Present	60	12
Absent	440	88
Total	500	100

Table 2: Comparison of profile of patients with and without diabetic foot ulcer

Variable	With diabetic foot ulcer	Without diabetic foot ulcer	p-value
Mean age (years)	52.8	43.5	0.001*
Mean HbA1c (%)	10.9	8.8	0.021*
Mean duration of diabetes (years)	10.7	7.3	0.032*
Family history of diabetes (%)	55	18.18	0.018*

*: Significant

DISCUSSION

Diabetic foot is a severe chronic diabetic complication that consists of lesions in the deep tissues associated with neurological disorders and peripheral vascular disease in the lower limbs. The incidence of diabetic foot has increased due to the worldwide prevalence of diabetes mellitus and the prolonged life expectancy of diabetic patients. A previous study showed that a lower limb is amputated due to diabetes every 30 s, and the average annual cost of diabetic foot is \$8659 per patient. The total medical cost for treating diabetic foot diseases in America ranges from \$9 to \$13 billion and is an additional cost associated with diabetes. Thus, the International Diabetes Foundation is increasing awareness of diabetic foot problems due to the substantial social, medical, and economic burdens.⁷⁻¹⁰

Almobarak AO et al determined the prevalence of DFU and its associated risk factors in Sudanese individuals with diabetes. Three hundred and ten individuals with type 2 diabetes, who have been on treatment for DM for at least 1 year and volunteered to participate, were enrolled in this study. Participants were interviewed using standardized pretested questionnaire to record medical history, socio-demographic, life style characteristics and presence of DFU. The prevalence of DFU was found to be 18.1% in this cohort (95% CI: 13.78–22.34%). Among different metabolic variants like hypertension, albuminuria, retinopathy, neuropathy,

HbA1c, cholesterol, high density lipoprotein (HDL), low density lipoprotein (LDL) and triglyceride, only duration of diabetes was significantly associated with DFU ($P < 0.0018$) as shown by logistic regression statistical analysis. Even after adjusting for all other potential risk factors, living with diabetes for more than 10 years is associated with an increase in the diabetic foot probability by 3.16 folds (95% CI: 0.52–10.48 folds increase), $P = 0.006$. The adjusted effect for living with diabetes for more than 20 years on the diabetic foot complication probability is an increase by 1.73 folds (95% CI: 0.39–4.37 folds increase), $P = 0.005$. However, living with diabetes for more than 5 years had a non-significant adjusted effect on diabetic foot probability. Prevalence of diabetic foot ulcer was 18.1% and the risk of development of diabetic foot ulcer is increased with duration of diabetes more than 10 years.¹¹

Limin Jia et al investigated the incidence and risk factors for developing infection in a large regional cohort of patients presenting with uninfected DFUs. They performed a secondary analysis of data collected from a validated prospective state-wide clinical diabetic foot database in Queensland (Australia). Patients presenting for their first visit with an uninfected DFU to a Diabetic Foot Service in one of thirteen Queensland regions between January 2012 and December 2013 were included. Socio-demographic, medical history, foot disease history, DFU

characteristics and treatment variables were captured at the first visit. Patients were followed until their DFU healed, or if their DFU did not heal for 12-months, to determine if they developed a foot infection in that period. Overall, 853 patients were included; mean(standard deviation) age 62.9(12.8) years, 68.0% male, 90.9% type 2 diabetes, 13.6% indigenous Australians. Foot infection developed in 342 patients for an overall incidence of 40.1%; 32.4% incidence in DFUs healed <3 months, 55.9% in DFUs healed between 3–12 months ($p<0.05$). Independent risk factors (Odds Ratio (95% confidence interval)) for developing infection were: DFUs healed between 3–12 months (2.3 (1.6–3.3)), deep DFUs (2.2 (1.2–3.9)), peripheral neuropathy (1.8 (1.1–2.9)), previous DFU history (1.7 (1.2–2.4)), foot deformity (1.4 (1.0–2.0)), female gender (1.5 (1.1–2.1)) and years of age (0.98 (0.97–0.99)) (all $p<0.05$). A considerable proportion of patients presenting with an uninfected DFU will develop an infection prior to healing. To prevent infection clinicians treating patients with uninfected DFUs should be particularly vigilant with those presenting with deep DFUs, previous DFU history, peripheral neuropathy, foot deformity, younger age, female gender and DFUs that have not healed by 3 months after presentation.¹²

CONCLUSION

Diabetic foot ulcers were more common in elderly males with higher duration of diabetes and higher HbA1c levels. Awareness regarding foot care was poor which underlines the need to promote practice of foot care amongst diabetic population.

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