

## Foot Care Practices in Patients with Diabetic Foot Ulcers: A Study in MVJMC & RH

Srinivas Rao Reddi\*, Arjun C.\*, Nishchal K.\*\*, Udayashankar\*\*

\*Post Graduate \*\*Professor, Department of General Surgery, M V J Medical College and Research Hospital, Hoskote, Bangalore, India.

### Abstract

*Introduction:* Diabetic foot ulcers are the most common cause for prolonged hospitalizations. Though preventable by effective identification, education and preventive foot care practice, we come across plenty cases of diabetic foot ulcers. Health education is imparted through various modes, however the practice of preventable measures remains important. *Objective:* To know the practices of foot care among patients with diabetic foot ulcer with predominant rural background. *Methodology:* Individuals having diagnosed diabetic foot ulcers (n=150) were selected from MVJMC & RH, Hoskote a rural medical college hospital. They were given an interviewer administered, pre tested questionnaire following informed consent. Patient perceptions of foot care were inquired. A scoring system ranging from 0-10 was employed to analyze the responses given for practice of diabetic foot care. Results: Mean age was 58.4 years (SD ±8.6) and 74% were males. Non healing ulcers were present among 82.7% and amputations amounted to 38.2%. The control of diabetes was poor in 60%. Regarding foot care knowledge, the mean score was 8.37, 75.5% had scored above mean and 52.7% were aware of all principles of foot care. Regarding foot care practices,

the mean score was 4.55, 47.3% participants had scored below mean and 22.7% did not practice any foot care principle and hence scored 0. A Statistically significant difference exists between the foot care knowledge and practice scores ( $p < 0.001$ ,  $z = -8.151$ ). In the study sample 51% were not educated prior to occurrence of complications. *Conclusion:* Results demonstrate a satisfactory knowledge on diabetic foot disease; however their practices of preventive techniques were unsatisfactory. Implementation of a national policy on diabetic foot management and good patient follow-up to increase compliance would help to improve this situation.

**Keywords:** Diabetic Foot Care; Practice.

### Introduction

Diabetes mellitus is a non communicable disease with multi-organ involvement.

It was known even in the ancient world as a disease that produces honey Taste urine. As per the International Diabetes Federation (2013), approximately 50% of all people with diabetes live in just three countries: China (98.4 million), India (65.1 million) and the USA (24.4 million)[1].

Diabetes in India - 2015			
Total adult population (1000s) (20-79 years)	798,988	Number of deaths in adults due to diabetes	1,027,911
Prevalence of diabetes in adults (20-79 years) (%)	8.7	Cost per person with diabetes (USD)	94.9
Total cases of adults (20-79 years) with diabetes (1000s)	69,188.6	Number of cases of diabetes in adults that are undiagnosed (1000s)	36,061.1

**Corresponding Author:** Arjun C., PG General Surgery, M V J Medical College and Research Hospital, Hosakote-562114 Bangalore, India.

E-mail: [dr.arjun.c001@gmail.com](mailto:dr.arjun.c001@gmail.com) Received on 17.01.2017, Accepted on 09.02.2017

Diabetes is associated with complications such as cardiovascular diseases, nephropathy, retinopathy and neuropathy, which can lead to severe morbidity and mortality. Another complication is neuropathy, which can lead to loss of sensation in feet combined with peripheral vascular changes act as a factors contributing to diabetic foot. Diabetic neuropathy is not a single disease; it encompasses several neuropathic syndromes, of which the commonest is peripheral symmetrical polyneuropathy [2]. Long standing peripheral neuropathy results in insensitivity facilitating trauma. Later the foot can secondarily become infected and it may need to be amputated if not managed appropriately.

In a study to detect the prevalence of diabetic neuropathy in Sri Lankashowed that 30.6% of diagnosed patients with diabetes had neuropathy and 10.2% suffered with diabetic foot [3]. Presence of amputations among 4.8% of the diabetic population highlights the importance of diabetic foot care. In developing countries walking barefoot is a common practice among rural population. This poses an additional risk for the development of diabetic foot complications [4]. The importance of diabetic foot care education and compliance with foot care practices has been emphasized in many studies [5]. Also they have shown that these programs must be customized according to the local situation [6]. In previous studies done in various parts of the world to assess the knowledge and practice of diabetic foot care has shown diverse results. While some countries show inadequate knowledge on foot care principals among patients 14 others have shown satisfactory knowledge but poor compliance [8]. Hence we can assume that the level of knowledge and practice may vary with the socio demographic factors of each region therefore it is essential to conduct studies to identify key lapses in diabetic foot management.

The diabetic foot should be managed by a multidisciplinary team at any part of the world [9]. The success of good patient education and self/nursing care to minimize amputations has been established by many studies, There are several established guidelines based on similar principals regarding the diabetic foot care. International Consensus on the Diabetic Foot is a prominent guide

which has been found effective previously [10]. The Diabetes Committee of the American Orthopaedic Foot and Ankle Society has also issued a guideline on proper foot care [19]. Foot problems account for many hospital admissions of patients with diabetes. Also it is recognized as a major cause of amputations. An understanding of the causes of these problems enables early recognition of patients at high risk. A study on self care of diabetic foot has not been conducted previously in South Asian region. Therefore this study aims to assess the knowledge and the level of practice of foot care principals among patients with chronic diabetic foot ulcers.

## Methodology

### *Data Collection and Arrangement*

All patients with diagnosed diabetic foot ulcers admitted to surgical ward of MVJMC & RH were eligible for the study. The diagnosis of diabetic foot ulcer disease must be supported by a established diagnosis of diabetes. Acutely ill patients and mentally subnormal patients were excluded. Purpose of study was explained to the patients and informed consent was obtained.

Patients were given an interviewer administered pretested questionnaire to assess the knowledge and practice of diabetic foot care. The questionnaire was formulated based on Indian Diabetes Federation checklist of diabetic foot prevention care with 10 questions. The patients were also asked if they were educated prior to this study and if they wanted to be educated now.

## Results

During the study period 150 patients with diabetic foot disease were studied. The mean age of study sample was 62.4 years. When age was categorized into 10 year intervals the majority of them belonged to age group 51 – 60 years (40%). Another 30% belonged to 61-70 age group, while 18.1% belonged to 41-50 age group.

**Table 1:**

Age Group	N	Percentage %
40-50	36	24
50-60	60	40
60-70	41	27.33
70-80	10	6.66
80+	03	2
Total	150	

Majority of participants were males (74%). When considering duration of diabetes, 14.6% has been having diabetes for 5 years or less, 20% for 6-10 years, 36% for 11-15 years and 18.6% for 16-20 years and 10.6% for more than 20 years. Regarding the complications of diabetes, 85.33% showed some form of neuropathy, 48.66% had associated retinopathy, 14.6% suffered with ischemic heart disease and 16.6% had nephropathy.

Insulin was used by 44% patients for their control of diabetes and others were using oral hypoglycemics.

Commonest presentation of diabetic foot disease was Non-healing ulcers (88%). Recurrent ulcers were present among 35.33%. The most serious complication was amputation, which was present in 2.6%. The practice of foot care among patients with chronic diabetic foot is shown in Table 2.

Table 1:

Question	Knowledge	Practices
inspection of feet daily	112	38
keeping the feet clean	150	142
dry trim nails carefully	123	56
appropriate foot wear	98	74
regular examination by doctor	120	20

Knowledge of foot care principles according to scoring system is shown in Table 2. According to our study nearly 74.66% had the knowledge of need for inspection of their feet daily but only 25.33% followed the practice. 94.66% of diabetics had the habit of cleaning their feet though only 37.33 percent of them were trimming the nails regularly and keeping their feet dry and 48% of the patients were using appropriate foot wear and only 13.3 percent were undergoing regular check up and examination by doctor. It is also evident that there is a statistically significant difference between the knowledge and practice of each of these foot care principals.

predisposes to ulcer development. Patients with diabetes also have an increased incidence of peripheral vascular disease, impaired wound healing, and decreased ability to fight infection. In light of these factors, it is sometimes difficult to determine the optimal course for patient management.

But unfortunately 10% (n=15) of them were not educated on foot care management prior to occurrence of complications.

Out of 150 patients majority were males and belonged to age group between 51 and 60 years. This shows that diabetic foot problem is mainly concentrated on elderly population which increases the morbidity in them due to diabetes. It is well known that diabetic foot disease occurs in long standing diabetes because the pathological process takes about 10 years to develop. This situation may occur due to delayed recognition and diagnosis of diabetes mellitus.

## Discussion

Higher presence of other micro and macrovascular complications of diabetes in this group shows the importance of regular screening of all micro vascular and macro vascular complications of diabetes when a patient with diabetic foot is encountered in medical practice.

Lower extremity ulcers represent a major concern for patients with diabetes and for those who treat them, from both a quality of life and an economic standpoint. Studies to evaluate quality of life have shown that patients with foot ulcers have decreased physical, emotional, and social function. Analyses of economic impact have shown (1) the majority of costs occur in the inpatient setting, (2) a lack of financial benefit when comparing primary amputation with an aggressive approach to limb salvaging including vascular reconstruction, and (3) private insurance provides greater reimbursement for inpatient care than does Medicare. Results of etiologic studies suggest that hyperglycemia induces diabetes-related complications through sorbitol accumulation and protein glycation, and the resultant nerve damage manifests as peripheral neuropathy, which

When we consider the knowledge of foot care in this sample each key principle of foot care was known by more than 50%. All aspects of foot care principles were known by only near 10% of study sample. The results show that patients are aware of their disease. That the health education being unsatisfactory in the rural areas. Since the self care of diabetic foot is based on simple medical facts we should aim at educating these people of principals of foot care.

In contrast the level of practice of the foot care principles were poor. Regular foot observation was followed by 25.33%. But rest of the principles were neglected by more than 50% of study sample. A scientifically validated questionnaire would be

valuable and could reduce duplication of work, but such questionnaire was not available at the time of the study. Even with the existence of a validated questionnaire it should be customized to local conditions.

### Conclusion

Results demonstrate a satisfactory knowledge on diabetic foot disease; however their practices of preventive techniques were unsatisfactory. Implementation of a national policy on diabetic foot management and good patient follow-up to increase compliance would help to improve this situation.

### References

1. International diabetes federation. IDF Diabetes atlas, 6<sup>th</sup> edition. Brussels, Belgium; International Diabetes federation (internet). 2013 (updated 2013 November 25, cited 2013 december 24).
2. McNeely MJ, Bokyo EJ, Ahroni JH, et al. The independent contributions of diabetic neuropathy and vasculopathy in foot ulceration. how great are the risks? *Diabetes care*. Feb 1995; 18(2):216-219 .
3. Fernando DJ. The prevalence of neuropathic foot ulceration in srilankan diabetic patients. *Ceylon Med J*. Sep.
4. Jayasinghe SA, Atukorala I, Gunethilleke B, siriwardene V, Herath SC, De Abrew K. is walking barefoot a risk factor for diabetic foot disease in developing countries ?*Rural Remote Health*. 2007 Apr-Jun; 7(2):692 .
5. Anichini R, Zucchini F, Cerretini I, et al. Improvement of diabetic foot care after the implementation of the international consensus on the Diabetic foot (ICDF); results of a 5-year prospective study, *diabetes res clin Pract*. 2007 Feb; 75(2):153-158.
6. Anselmo MI , Nery M, Parisi MC, the effectiveness of educational practice in diabetic foot; a view from Brazil.*sDiabetol Syndr* 2010; 2(1):45.
7. Khamesh ME, Vatankhah N, Baradaran HR, knowledge and practice of foot care in Iranian people with type 2 diabetes 2007; 4(4):298-302.
8. Barbui EC, Cocco MI, [knowledge of the diabetic patient on foot care] *Rec Esc Enferm USP*. 2002 Mar; 36(1):97-103.
9. Moreno Hernandez MI, Trilla Soler M ,Espluga capdevila A et al [self care and risk factors of diabetic foot in patients with type 2 diabetes mellitus] *Aten Primaria* 1997 Sep 15; 20(4):185-190.
10. Pinzur MS, Slovenkai MP, Trepman E, Guidelines for diabetic foot care. The diabetes committee of the American orthopaedic foot and Ankle Society, *foot Ankle Int* 1999 Nov; 20(11):695-702.