Original Research Article

# Demographic Profile of Diabetic Foot Ulcers

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## Abstract

**Background and objective:** Diabetes associated problems are the second most common cause of lower limb amputations in India. We conducted this study to find out the socio-demographic profile and factors associated with diabetic foot ulcers.**Materials and methods:** This prospective non-randomized control study was conducted at Yenepoya Medical College Hospital on patients with diagnosed diabetic foot who were chosen by purposive sampling from October 2012 to September 2014. A total of 75 patients were chosen for the study after taking an informed verbal consent. Data was collected using questionnaire regarding sociodemographic profile, complications and associated factors. **Results:** Majority of the patients receiving treatment for diabetic foot were males. The average duration of diabetes mellitus observed was for 5-10 years. Our study also revealed that neuropathy was the most common complication associated with diabetic foot. **Conclusion:** Regular monitoring of blood sugar levels and foot screening should be done for diabetic as well as non-diabetic older adults for early detection of risk factors to reduce the foot complications.

**Keywords:** Diabetes mellitus, Complications, Ulcer



## Introduction

Among diabetes complications, managing diabetic foot remains as a major challenge for health care systems[1]. Diabetic foot is still the most frequent reason of hospitalization of patients with diabetes[2,3]. and diabetes is the main cause of more than half of nontraumatic lower limb amputations[4,5].In fact, every 30 seconds in the world, a lower limb is amputated due to diabetes[6], and it goes without saying that these amputations increase mortality rate.

Since the development of foot ulcers and amputations are preventable and this condition can greatly affect the quality of life of patients, prevention of this complication can relieve direct and indirect cost burdens on society. Large cohort studies on diabetic foot ulcer (DFU) incidence are rare[7,8]. In India, there has rare cohort study conducted on this complication; furthermore, the socio-demographic differences between different societies can affect the incidence rates. Therefore, this cohort was designed to identify sociodemographic profile of diabetic foot ulcers.

**Material and method**

This prospective non-randomized control study was conducted at Yenepoya Medical College Hospital on patients diagnosed with diabetic foot ulcers who were chosen by purposive sampling between October 2012 to September 2014 for a period of 15 months. The subjects were recruited according to the following inclusion and exclusion criteria:

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**Inclusion criteria**

Age ≥ 18 years; diagnosed with diabetes mellitus, both types 1 and 2; able to complete the consent form; and able to walk.

**Exclusion criteria**

Diabetic foot associated with venous ulcers and Lymphedema.

Data was collected using questionnaire regarding sociodemographic profile, complications and associated factors. A checklist including the following variables was completed for all participants: age, sex, blood pressure (BP), marital status, educational level, ethnicity, body mass index (BMI), waist circumference, job activity, smoking status, type of diabetes, diabetes duration, type of diabetes treatment (oral antidiabetes agents or insulin usage), diabetic retinopathy, diabetic nephropathy, history of DFU or amputation, present foot ulcer, preventive foot care, nail care, ill-fitting shoe, and patient training on feet.

**Statistical analysis**

Data was analyzed using SPSS software version 20.

**Results**

Majority of the patients receiving treatment for diabetic foot were males while females accounted for only 23% indicating a marked difference on basis of the gender. In our study most of the patients belonged to the age group 41-60 years (table 1).

**Table 1: Gender and age distribution among the study subjects**

| Variables | N | % |
|---|---|---|
| Age Group (in years) | | |
| <30 | 2 | 2.67 |
| 31-40 | 6 | 8.00 |
| 41-50 | 25 | 33.33 |
| 51-60 | 30 | 40.00 |
| 61-70 | 8 | 10.67 |
| >70 | 4 | 5.33 |
| Gender | | |
| Male | 58 | 77.23 |
| Female | 17 | 22.67 |
| Total | 75 | 100 |

Most of the patients were ignorant in expressing the precise duration of diabetes mellitus. However from the best of their knowledge it was expressed that the average duration available most of them had diabetes for 5-10 years (table 2).

**Table 2: Duration of diabetes mellitus in years**

| Duration of Diabetes Mellitus | N | % |
|---|---|---|
| Newly detected | 9 | 12.00 |
| 1-5 years | 9 | 12.00 |
| 5-10 years | 32 | 42.67 |
| 11-15 years | 18 | 24.00 |
| 16-20 years | 6 | 8.00 |
| 21-25 years | 1 | 1.33 |
| >25 years | 0 | 0.00 |

Diabetic foot complications manifests in myriad forms and in this study it was observed that ulcer was the most common form of presentation. The cause of ulcer could not be determined. In the non specific ulcer group, some recalled that it could be trauma which was not noticed (table 3).

**Table 3: Mode of presentation of diabetic foot**

| Duration of Diabetes Mellitus | N | % |
|---|---|---|
| Non Heal Ulcer | 28 | 37.33 |
| Fissure | 1 | 1.33 |
| Gangrene | 1 | 1.33 |
| Cellulitis | 2 | 2.67 |
| Trophic Ulcer | 3 | 4.00 |
| Ulcer | 37 | 49.33 |
| Traumatic Ulcer | 2 | 2.67 |
| Blister | 1 | 1.33 |

In our study we found that neuropathy was the most common complication associated with diabetic foot (table 4).

**Table 4: Complications of diabetes mellitus**

| Complications | N | % |
|---|---|---|
| Neuropathy | 59 | 78.67 |
| Ischaemia | 68 | 90.67 |

In our study we concluded that the need for regular insulin was more in the patients with ulcers as the blood sugar level fluctuation was more and hence during hospital stay short acting insulin was the most preferred modality of diabetic control (table 5).

**Table 5: Glycemic control and mode of control of diabetes**

| Variables | N | % |
|---|---|---|
| HbA1c | | |
| Less than 5.7% | 6 | 8.00 |
| 5.7% to 6.4% | 10 | 13.33 |
| 6.5% to 7.4 | 10 | 13.33 |
| >7.5 | 49 | 65.33 |
| Mode of Diabetic Control | | |
| Oral/Hm | 1 | 1.33 |
| HA | 40 | 53.33 |
| Lup Insulin | 1 | 1.33 |
| HA/OHG | 16 | 21.33 |
| Hm/Lup | 2 | 2.67 |
| Ohg | 15 | 20.00 |

**Discussion**

Diabetic foot disease can be defined as a group of heterogeneous conditions of foot abnormalities, in which peripheral neuropathy and peripheral vascular disease, sometimes complicated by infections, may result in foot ulceration and possible subsequent amputation[9]

In our study, diabetic foot was dominated by males which is comparable with the following studies. A similar tendency was

reported by Bansal et al[10], NimaMadanchi et al[11], Aiping Wang et al [12] , Safaa Ali Khudhair[13]and Ali et al[14]. This could be explained by the fact that men have more outside activity than have women, which may lead to more foot exposure to different risks and more plantar pressure on their feet.Most of the patients in our study belong to age group 41-60 years which is comparable with the studies done by Bansal et al[10] and Ali et al[14]. Duration of diabetes was greater than ten years among 58% of the subjects according to Ali and co-workers while in our study, the duration of diabetes>10 years was found among 43%.The etiology of the ulcer as reported by Ali and co-workers[14] was unknown (38%) which is comparable with our study in which 22% did not have any preceding factor to develop diabetic foot.In our study, neuropathy was more common than ischemic complication in diabetic ulcer this is comparable to a study by Bansal and co-workers[10] who had similar findings. In a study by Safaa Ali Khudhair[13], diabetic neuropathy was the most common complication of diabetes mellitus and it is associated with poor glycemic control.In our study we found that the need for regular insulin was more in the patients with ulcers as the blood sugar level fluctuation was more and hence during hospital stay short acting insulin was the most preferred modality of diabetic control

The limitations of this study were:

a. As tertiary care centre the cases don't represent the actual burden and type in the population at study.
b. The short sample size in comparison to the disease burden in the society.
c. The short duration of study as compared to the chronicity of the disease

**Conclusion**

Regular monitoring of blood sugar levels and foot screening should be done for diabetic as well as non-diabetic older adults for early detection of risk factors to reduce the foot complications.

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