MAK HILL Publications Research Journal of Medical Sciences

Research Article
doi: 10.59218/makrjms.2024.6.105.108

OPEN ACCESS

**Key Words**
Diabetic foot ulcer, risk factors, clinical profile

**Corresponding Author**
Prashant Yadahalli,
Department of General Surgery, SDM College of Medical Sciences and Hospital, Dharwad, Karnataka, India

**Author Designation**
[1-3]Assistant Professor

**Received:** 10 March 2024
**Accepted:** 15 April 2024
**Published:** 16 April 2024

**Citation:** Ramesh Singaraddi, Vikram Nagathan and Prashant Yadahalli, 2024. A Study on Clinical Profile of Patients With Diabetic Foot Ulcer. Res. J. Med. Sci., 18: 105-108, doi: 10.59218/makrjms.2024.6.105.108



# A Study on Clinical Profile of Patients with Diabetic Foot Ulcer

[1]Ramesh Singaraddi, [2]Vikram Nagathan and [3]Prashant Yadahalli

*[1,2]Department of General Surgery, S Nijalingappa Medical College and Hospital, Bagalkot, Karnataka, India*
*[3]Department of General Surgery, SDM College of Medical Sciences and Hospital, Dharwad, Karnataka, India*

**ABSTRACT**
Several co-existing risk factors contribute to the development of a Diabetic foot ulcer and include lifestyle factors, co-morbidity and late complications of the disease. Peripheral vascular diseases, peripheral neuropathy in combination with foot deformities and high plantar pressure are few risk factors that increase the risk of developing Diabetic foot ulcers. A total of 82 diabetic patients with diabetic foot ulcers irrespective of the duration, attending surgical outpatient clinic or admitted to the hospital were studied based on the inclusion and exclusion criteria mentioned previously. The baseline demographic data which includes age, sex, occupation, educational qualifications, habits (smoking/consumption of alcohol) and socioeconomic status were recorded. In our study 43.9% of patient have no comorbidities other than DM and whereas 51.2% are hypertensives, 2.4% had Peripheral Vascular Disease, 2.4% had Chronic Liver Disease, 1.2% had Coronary Artery Disease, 1.2% had Chronic Kidney Disease.

## INTRODUCTION

Diabetes mellitus is an endocrine disorder affecting multiple systems, which is characterized by chronic hyperglycaemia with disturbances of carbohydrate, fat and protein metabolism resulting from in insulin secretion, insulin action, or both[1]. The prevalence of diabetes mellitus in the world is rapidly increasing[2]. The number of patients with diabetes was about 415 million in 2015 and it is estimated that it will rise to approximately 600 million in 2035[3]. Foot ulcers are serious complication in diabetes and the most common factor leading to lower extremity amputation. Several co-existing risk factors contribute to the development of a Diabetic foot ulcer and include lifestyle factors, co-morbidity and late complications of the disease. Peripheral vascular diseases, peripheral neuropathy in combination with foot deformities and high plantar pressure are few risk factors that increase the risk of developing Diabetic foot ulcers[4,5-7]. Poor vision and greater body mass have also been shown to be related to the development of Diabetic foot ulcers[4,7,8]. Foot ulcers are preventable and early intervention is essential to avoid serious complications. It is estimated that, for every 20 seconds, a person in the world undergoes an amputation due to the complications of diabetes9. Moreover, in 2015, the disease resulted in five million deaths. The risk of developing Diabetic foot ulcers among patients with diabetes is estimated to be approximately 6-38%, considering a duration of the illness of 10 years. This estimation is based on a population-based annual incidence of Diabetic foot ulcers of 1.0-7.2%.10-13.

## MATERIALS AND METHODS

**Study Population:** Patients with Diabetes Mellitus in the age group 20-80 years.

**Study Design:** A prospective, observational study.

**Sample Size:** Accordingly, sample size calculated was 82 and hence, 82 study subjects were considered for this study.

**Inclusion Criteria:**

- **Age Limit:** 20-80 years
- All subjects suffering from diabetes mellitus (as per WHO criteria) with foot ulcers
- Symptoms of Diabetes plus random blood sugars >200 mg/dl or
- Fasting blood sugars >126 mg/dl or
- Two hour plasma glucose levels >200 mg/dl
- All diabetic foot ulcers irrespective of its duration
- Patients willing to participate in the study

**Exclusion Criteria:**

- Venous stasis ulcers with Diabetes mellitus
- Non diabetic neuropathic ulcers
- Ulcers above the ankle
- All non-diabetics with foot ulcers
- Patients not giving consent to participate in the study
- Patients with an immun. compromised state

A total of 82 diabetic patients with diabetic foot ulcers irrespective of the duration, attending surgical outpatient clinic or admitted to the S Nijalingappa Medical College Bagalkot were studied based on the inclusion and exclusion criteria mentioned previously. The baseline demographic data which includes age, sex, occupation, educational qualifications, habits (smoking/consumption of alcohol) and socioeconomic status were recorded. Duration of diabetes and treatment history of management of diabetes were recorded. Ulcers were scored by the below mentioned variables. Diabetic ulcer severity score (DUSS) were calculated by adding these separate scored variables to a theoretical maximum of 4.

## RESULTS AND DISCUSSIONS

In our study a total of 82 patients with diabetic foot ulcers attending surgical out patient clinic or admitted into the hospital were recruited based on inclusion and exclusion criteria. Most of the patients were in the age group 51-60years (37.8%) followed by 61-70(31.7%) years. Out of 82 patients 72 were elder than 50 years (87.8%). Youngest patient was 39 year old and the oldest was 85 year old. A clear gender based distinction was observed among the participants, with 64.6% of them being males. In our study 69.5% of patients presented ulcer on foot where as 30.5% on toes. In 59.8% of patients peripheral pulse felt whereas in 40.2% of patients pulse not felt. In our study 22% of patients had HbA1c less than or equal to 7, 24.4% had 7-8, 28% of patients had between 8-10 and 25.6% of patients had more than 10. In our study 43.9% of patient have no comorbidities other than DM and whereas 51.2% are hypertensive, 2.4% had Peripheral Vascular Disease, 2.4% had Chronic Liver Disease, 1.2% had Coronary Artery Disease, 1.2% had Chronic Kidney Disease. About 64.6% of patients had previous foot complaints whereas 35.4% of patients had no previous foot complaints. The primary treatment goal for diabetic foot ulcers is to obtain wound closure as expeditiously as possible. Resolving

**Table 1: Distribution of patients according to their age group (N = 82)**

| Age (in Years) | No. | Percent |
|---|---|---|
| ≤40 | 3 | 3.7 |
| 41-50 | 7 | 8.5 |
| 51-60 | 31 | 37.8 |
| 61-70 | 26 | 31.7 |
| 71-80 | 12 | 14.6 |
| >80 | 3 | 3.7 |
| Mean (SD) | 61.4 (9.7) | |
| Range | 39-85 | |

**Table 2: Distribution of patients according to their gender (N = 82)**

| Gender | No. | Percent |
|---|---|---|
| Male | 53 | 64.6 |
| Female | 29 | 35.4 |

**Table 3: Distribution of patients according to the ulcer site (N = 82)**

| Ulcer Site | No. | Percent |
|---|---|---|
| Toes | 25 | 30.5 |
| Foot | 57 | 69.5 |

**Table 4: Distribution of patients according to the pulses (N = 82)**

| Pulses | No. | Percent |
|---|---|---|
| Present | 49 | 59.8 |
| Absent | 33 | 40.2 |

**Table 5: Distribution of patients according to the HbA1c (N = 82)**

| HbA1c | No. | Percent |
|---|---|---|
| ≤7 | 18 | 22.0 |
| 7-8 | 20 | 24.4 |
| 8-10 | 23 | 28.0 |
| >10 | 21 | 25.6 |
| Mean (SD) | 8.76 (2.01) | |
| Range | 5.5-14.2 | |

**Table 6: Distribution of patients according to the comorbidities (N = 82)**

| Comorbidities | No. | Percent |
|---|---|---|
| Absent | 36 | 43.9 |
| Hypertension | 42 | 51.2 |
| Coronary Artery Disease | 1 | 1.2 |
| Peripheral Vascular Disease | 2 | 2.4 |
| Chronic Kidney Disease | 1 | 1.2 |
| Chronic Liver Disease | 2 | 2.4 |

**Table 7: Distribution of patients according to the previous foot complaints (N=82)**

| Previous Foot Complaints | No. | Percent |
|---|---|---|
| Present | 29 | 35.4 |
| Absent | 53 | 64.6 |

foot ulcers and decreasing the recurrence rate can lower the probability of lower extremity amputation in the diabetic patient[9]. Early advanced or appropriate wound care practices may be more cost-effective than standard care practices decreasing the incidence of lower extremity amputations. The essential therapeutic areas of diabetic ulcer management are as follows: management of co morbidities, evaluation of vascular status and appropriate treatment, assessment of lifestyle/psycho social factors, ulcer assessment and evaluation, tissue management/wound bed preparation and pressure relief. Because diabetes is a multi-organ systemic disease, all co-morbidities that affect wound healing must be assessed and managed by a multi disciplinary team for optimal outcomes in the diabetic foot ulcer[4]. Many systemic manifestations affect wound healing. Among the most common co-morbidities are hyperglycemia and vascular diseases such as cerebral vascular accidents, transient ischemic attacks, myocardial inactions, angina, valvular heart disease, atrial fibrillation, aneurism, renal dysfunction, hypertension, hypercholesterolemia and hyperlipidemia[10]. Control of hyperglycemia and achieving euglycaemia in a patient with diabetic foot ulcer is of paramount importance because hyperglycemia can predispose to new infections, delayed wound healing and spreading of existing infections, septicaemia and its attendant complications. In fact, foot infections are common in patients with diabetes and are associated with high morbidity and risk of lower extremity amputation. Glyceric control has been enunciated as the foremost principle in effective management of diabetic foot ulcers and preventing amputations[11]. A target HbA1c of <7% is acceptable in diabetic patients and is applicable for diabetic foot ulcer patients as well. Euglycaemia is best achieved by prescribing insulin therapy to these patients.

## CONCLUSION

In our study youngest patient was 39 year old and the elder was 85 year old. The highest number of patients was seen in the age group of 51-60 years. A clear gender based distinction was observed among the participants, with 64.6% of them being males. Commonest site of ulcer was foot compared to toes.

## REFERENCES


1. Abbott, C.A., L. Vileikyte, S. Williamson, A.L. Carrington and A.J. Boulton, 1998. Multicenter study of the incidence of and predictive risk factors for diabetic neuropathic foot ulceration. Diabetes Care, 21: 1071-1075.
2. Reiber, G.E., 1996. The epidemiology of diabetic foot problems. Diabetic Med., Vol. 13 .10.1002/dme.1996.13.s1.6.
3. Lavery, L.A., D.G. Armstrong, R.P. Wunderlich, J. Tredwell and A.J.M. Boulton, 2003. Diabetic foot syndrome: Evaluating the prevalence and incidence of foot pathology in Mexican Americans and non-Hispanic whites from a diabetes disease management cohort. Diabetes Care, 26: 1435-1438.
4. Singh, N., D.G. Armstrong and B.A. Lipsky, 2005. Preventing foot ulcers in patients with diabetes. JAMA, 293: 217-228.
5. IWGDF., 2011. International consensus on the diabetic foot and practical guidelines on the management and the prevention of the diabetic foot. International Working Group on the Diabetic Foot, Amsterdam, Netherlands,
6. Ramsey, S.D., K. Newton, D. Blough, D.K. McCulloch, N. Sandhu, G.E. Reiber and E.H. Wagner, 1999. Incidence, outcomes and cost of foot ulcers in patients with diabetes. Diabetes Care, 22: 382-387.

7. Beckert, S., M. Witte, C. Wicke, A. Königsrainer and S. Coerper, 2006. A new wound-based severity score for diabetic foot ulcers: A prospective analysis of 1,000 patients. Diabetes. Care., 29: 988-992.
8. Alexiadou, K. and J. Doupis, 2012. Management of diabetic foot ulcers. Diabetes Ther., Vol. 3 .10.1007/s13300-012-0004-9.
9. Naves, C.C.L.M., 2016. The diabetic foot: A historical overview and gaps in current treatment. Adv. Wound Care, 5: 191-197.
10. Reiber, G.E., L. Vileikyte, E.J. Boyko, M. del Aguila, D.G. Smith, L.A. Lavery and A.J. Boulton, 1999. Causal pathways for incident lower-extremity ulcers in patients with diabetes from two settings. Diabetes Care, 22: 157-162.
11. Most, R.S. and P. Sinnock, 1983. The epidemiology of lower extremity amputations in diabetic individuals. Diabetes Care, 6: 87-91