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ASSESSMENT OF PREVALENCE, RISK FACTORS AND TREATMENT OF DIABETIC FOOT ULCERS IN TYPE - 2 DIABETES PATIENTS

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Abstract

Diabetic foot ulcers (DFUs) are among the most serious and disabling complications of type 2 diabetes mellitus, leading to prolonged hospitalisation, infection, lower-limb amputation, and increased mortality, especially in rural populations. This hospital-based retrospective study aimed to assess the prevalence, associated risk factors, and treatment patterns of diabetic foot ulcers among patients with type 2 diabetes mellitus. The study was conducted over a period of six months in the Department of General Surgery at SVS Medical College and Hospital, Mahabubnagar, and included 50 patients diagnosed with diabetic foot ulcers. Demographic data, clinical characteristics, risk factors, laboratory parameters including random blood glucose and HbA1c, ulcer severity, and treatment modalities were analysed using appropriate statistical methods. The results indicated that DFUs were most common among patients aged 50–70 years, with a higher prevalence in males. Hypertension was the predominant risk factor among females, while smoking was more common among males. Mild ulcers were observed in 22 patients, moderate ulcers in 12, and severe ulcers in 16 patients. Treatment strategies primarily included antibiotic therapy, insulin administration, wound dressing, debridement, and pain management. The findings emphasise the importance of early diagnosis, effective glycaemic control, risk-factor modification, patient education, and multidisciplinary management to reduce complications and improve clinical outcomes in patients with diabetic foot ulcers.

Keywords: Diabetic Foot Ulcer, Type 2 Diabetes Mellitus, Glycemic Control, Risk Factors, Ulcer Severity, Multidisciplinary Management.

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Introduction

Diabetes mellitus is a rapidly growing global health problem, with type 2 diabetes accounting for the majority of cases [1,2]. Among its chronic complications, diabetic foot ulcers (DFUs) remain one of the most severe and challenging conditions, contributing significantly to patient morbidity, mortality, and healthcare expenditure [3]. A diabetic foot ulcer is defined as a full-thickness wound of the skin occurring below the ankle in a patient with diabetes, commonly resulting from a combination of peripheral neuropathy, peripheral arterial disease, infection, and poor glycaemic control [4,5].

The prevalence of diabetic foot ulcers varies widely across regions, influenced by socioeconomic status, access to healthcare, patient awareness, and lifestyle factors [6,7]. Studies suggest that approximately 15–25% of individuals with diabetes will develop a foot ulcer during their lifetime, with a substantial proportion progressing to infection and lower-limb amputation if not managed promptly [8-12]. Peripheral neuropathy leads to loss of protective sensation, while ischemia due to vascular insufficiency impairs wound healing, creating a high-risk environment for ulcer formation [13,14]. Several modifiable and non-modifiable risk factors are associated with DFUs, including advanced age, male gender, long duration of diabetes, smoking, hypertension, obesity, poor glycaemic control, and previous history of foot ulcers. Inadequate foot care practices and delayed medical attention further increase the risk of ulcer progression and complications [15-19].

Management of diabetic foot ulcers requires a multidisciplinary approach involving glycemic control, infection management, wound care, surgical interventions such as debridement, and patient education. Early diagnosis and appropriate treatment strategies play a critical role in preventing ulcer deterioration and amputation [20-22]. Despite advances in treatment, DFUs continue to pose a major burden, particularly in rural populations where awareness and healthcare resources are limited [23]. Therefore, this study was undertaken to assess the prevalence, risk factors, and treatment modalities of diabetic foot ulcers among patients with type 2 diabetes mellitus, to identify key determinants and improve preventive and therapeutic strategies.

MATERIALS AND METHODS

Study Design and Duration

This was a hospital-based, retrospective observational study conducted over a period of six months in the Department of General Surgery at SVS Medical College and Hospital, Mahbubnagar.

Study Population and Sample Size

A total of 50 patients diagnosed with diabetic foot ulcers and having type 2 diabetes mellitus were included in the study. The sample size was selected based on the availability of eligible patient records during the study period.

Study Setting and Source of Data

The study was carried out in the Department of Surgery at SVS Medical College and Hospital, Mahbubnagar. Data were obtained from patient case sheets, structured questionnaire forms, and medication records maintained in the hospital.

Inclusion Criteria

- Patients diagnosed with diabetic foot ulcer based on clinical and/or laboratory findings
- Patients with type 2 diabetes mellitus
- Patients willing to provide informed consent

Exclusion Criteria

- Patients who did not provide informed consent
- Patients with immunodeficiency disorders such as HIV
- Patients with a history of malignancy within the past five years

Data Collection Procedure

Following ethical approval and informed consent, relevant patient data were collected using a predesigned data collection form. Information gathered included demographic details, clinical manifestations, laboratory investigations such as random blood glucose (GRBS), HbA1c, complete blood count, and blood culture reports (when signs of infection were present), along with details of prescribed medications and treatment modalities. All collected data were systematically recorded in Microsoft Excel sheets for analysis[24,25].

Study Procedure

Eligible patients were identified through medical records. The collected data were reviewed and analyzed to assess

the prevalence of diabetic foot ulcers, associated risk factors, and treatment outcomes. No additional interventions or investigations were performed beyond routine clinical care[26].

Statistical Analysis

Descriptive statistics were used to summarise demographic and clinical data. Mean ± standard deviation (SD) values were calculated for continuous variables. The chi-square test was applied to assess associations between categorical variables, while analysis of variance (ANOVA) was used for quantitative data comparisons. Statistical significance was considered at $p < 0.05$ with a 95% confidence interval[27].

Statistical Software

Data analysis was performed using the Statistical Package for the Social Sciences (SPSS) version 23 and GraphPad Prism version 9.

Ethical Considerations

Ethical clearance was obtained from the Institutional Ethics Committee before the commencement of the study. The approval reference number was IEC/DHR-01/(02/09)/2025/021/9. Patient confidentiality was strictly maintained, and no anticipated risks or adverse events were associated with participation in the study.

RESULTS AND DISCUSSION

The present retrospective study was conducted at SVS Medical College and Hospital and included a total of 50 patients diagnosed with diabetic foot ulcers (DFU) associated with type 2 diabetes mellitus. The results were analysed based on age, gender, social history, diagnosis, and treatment modalities.

Distribution Based on Age

The age-wise distribution revealed that the majority of patients belonged to the 50–70 years age group, accounting for 33 cases (66%). The highest prevalence was observed in the 50–60 years group with 15 patients (30%). The 30–40 years and 40–50 years age groups comprised 9 (18%) and 8 (16%) patients, respectively. The findings indicate that DFUs are more prevalent among older adults, particularly those above 50 years of age.

Table 1: Distribution Based on Age

Age Group (years)	Number of Patients	Percentage
30–40	9	18%
40–50	8	16%
50–60	15	30%
60–70	9	18%
70–80	9	18%
Total	50	100%

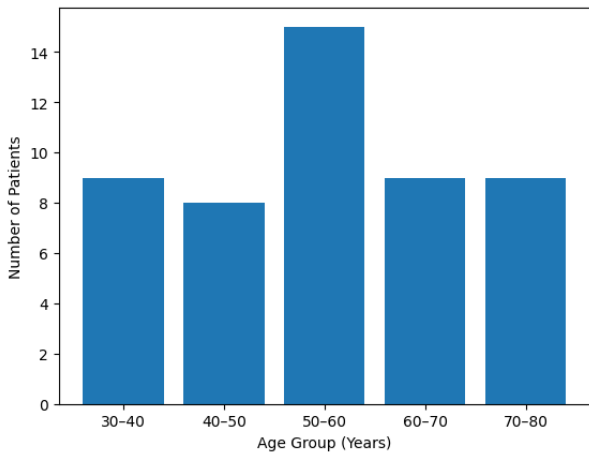


Figure 1: Graph showing gender-wise distribution of diabetic foot ulcer patients.

Distribution Based on Gender

Out of the 50 patients included in the study, 30 (60%) were males and 20 (40%) were females. This indicates a male predominance in the occurrence of diabetic foot ulcers.

Table 2: Distribution Based on Gender

Gender	Number of Patients	Percentage
Male	30	60%
Female	20	40%
Total	50	100%

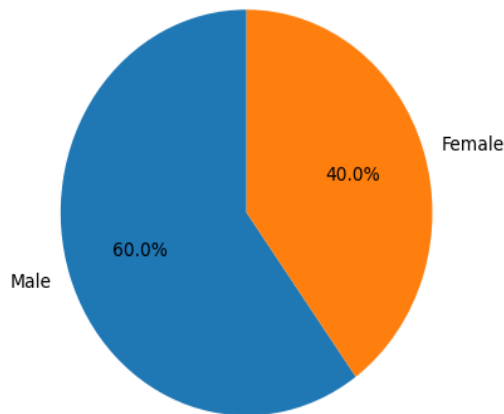


Figure 2: Pie Graph showing distribution of social history risk factors among male and female patients with diabetic foot ulcers.

Distribution Based on Social History

Among female patients, hypertension was the most common risk factor (6 cases), followed by obesity (5 cases). Neuropathy was rare among females, and none reported smoking. Among male patients, smoking was the predominant risk factor (10 cases), followed by

neuropathy (9 cases). Hypertension was observed in 4 male patients, while obesity was the least common.

Table 3: Distribution Based on Social History

Social History	Male (n)	Female (n)
Hypertension	4	6
Non-alcoholic	9	4
Smoking	10	0
Neuropathy	9	1
Obesity	2	5

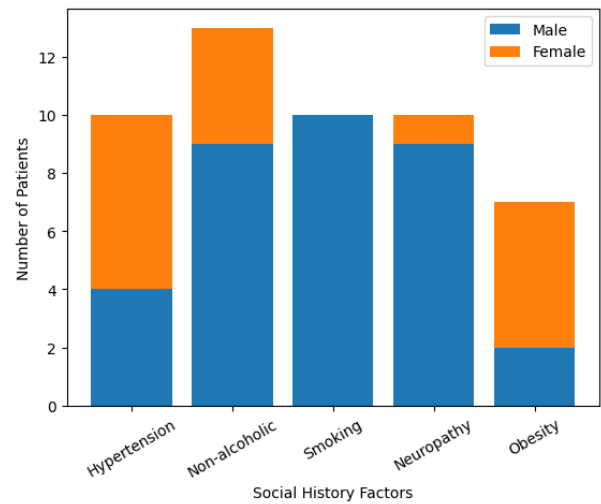


Figure 3: Distribution of social history risk factors among male and female diabetic foot ulcer patients.

Distribution Based on Diagnosis

Based on clinical severity, mild DFU was observed in 22 patients (44%), moderate DFU in 12 patients (24%), and severe DFU in 16 patients (32%). Mild ulcers constituted the largest group, indicating earlier stages of disease presentation in a significant proportion of patients.

Table 4: Distribution Based on Diagnosis

Severity of Ulcer	Number of Patients
Mild	22
Moderate	12
Severe	16
Total	50

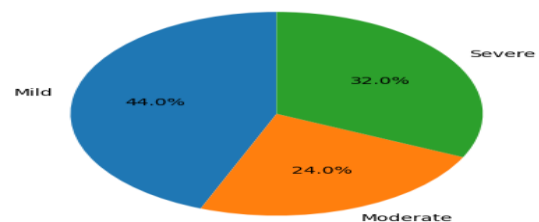


Figure 4: Severity distribution of diabetic foot ulcers among study participants.

Distribution Based on Treatment

Treatment patterns showed that insulin therapy and wound dressing were the most commonly used interventions (15 patients each). Antibiotics were prescribed to 10 patients, pain relievers to 6 patients, and surgical debridement was required in 4 patients, highlighting the need for multidisciplinary management.

Table 5: Distribution Based on Treatment

Treatment Modality	Number of Patients
Antibiotics	10
Insulin	15
Pain Relievers	6
Wound Dressing	15
Debridement	4

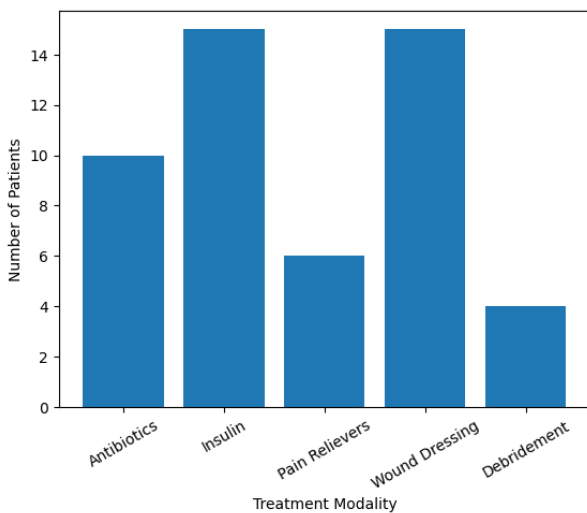


Figure 5: Distribution of treatment modalities used in diabetic foot ulcer patients.

Conclusion

Diabetic foot ulcers (DFUs) represent a major and persistent complication of type 2 diabetes mellitus, contributing substantially to morbidity, mortality, and healthcare burden. This study highlights a higher prevalence of DFUs among older adults and males, with strong associations observed with modifiable risk factors such as poor glycaemic control, smoking, and hypertension. The findings emphasise that effective DFU management requires early identification, multidisciplinary intervention, and consistent patient education. Common therapeutic approaches, including antibiotic therapy, insulin management, wound care, and surgical debridement, underscore the necessity of an integrated treatment strategy. Preventive measures—particularly routine foot examinations, patient counselling on foot hygiene, appropriate footwear, and strict blood

glucose monitoring—play a critical role in reducing complications such as infection and amputation. Strengthening awareness, improving healthcare infrastructure, and implementing routine screening protocols are essential to minimising disease progression and improving quality of life among diabetic patients.

Limitations

- The study was conducted over a short duration.
- A relatively small sample size limited generalizability.
- The study population may not represent all regions due to variations in healthcare access, cultural practices, and environmental factors.

Funding

Nil

Conflict of Interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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Author Contributions

Rumana Khanam conceived and supervised the study and drafted the manuscript. K. Nikhitha, Kalal Omdharshini, and Asveera Fatima contributed to data collection, analysis, and manuscript preparation. All authors reviewed and approved the final manuscript.

Ethical Statement

Ethical clearance was obtained from the Institutional Ethics Committee of SVS Medical College and Hospital, Mahbubnagar, before the initiation of the study (Reference number: IEC/DHR-01/ (02/09)/2025/021/9

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