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Diabetic foot ulcer among diabetic patients accessing care in a tertiary hospital in a poor resource setting: A snapshot

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Abstract

Background: Diabetic foot ulcers (DFUs) is a severe and debilitating complication of diabetes mellitus, often leading to morbidity, prolonged hospitalization, and non-traumatic limb amputations. As a result, understanding the local burden of this complication is essential for improving preventive care and patient outcomes.

Objectives: To determine the frequency and determinants of diabetic foot ulcers among diabetic patients at Abia State University Teaching Hospital (ABSUTH).

Methodology: A retrospective study was conducted using medical records from ABSUTH covering the period from July 2024 to December 2024. The study included a sample of 152 diabetic patients. Data were analyzed to determine the overall prevalence rate and to identify distributions across demographic variables such as age and gender using statistical measures including the chi-square test.

Results: The prevalence of diabetic foot ulcers was found to be 10.5% (16 out of 152 patients). Analysis by sex revealed a higher prevalence among males (12.9%) compared to females (7.5%), though this difference was not statistically significant ($p = 0.275$). Regarding age, the highest proportion of cases (13.0%) occurred in the 50–59 years age group, while patients aged 40–49 and 60+ showed prevalence rates of 7.7% and 8.8%, respectively.

Conclusion: The study indicates a moderate prevalence of diabetic foot ulcers at ABSUTH, aligning with broader Nigerian trends. The findings highlight that DFUs frequently affect middle-aged and male patients in this setting. These results underscore the need for targeted interventions and enhanced patient education on foot self-care to reduce the incidence and severity of this complication.

Keywords: Diabetes Mellitus; Diabetic Foot Ulcer; Frequency; Absinth; Nigeria

1. Introduction

Diabetic foot ulcers (DFUs) represent one of the most frequent and severe complications associated with diabetes mellitus (DM), contributing to approximately 7% to 11% of hospital admissions among individuals living with diabetes

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[1]. The condition places a substantial burden on communities, particularly in developing countries, where it exerts significant financial strain on low-income households and overstretched healthcare systems.

DFUs are not only common but also highly disabling, often progressing to lower limb amputation. The condition is associated with high mortality rates, and even after successful healing, recurrence of ulcers is common [2]. Owing to their multifactorial origin and diverse clinical manifestations, diabetic foot ulcers require prompt diagnosis and specialist management. Effective care strategies must address secondary infections, peripheral vascular insufficiency, and abnormal pressure distribution resulting from peripheral neuropathy and restricted joint mobility. Nevertheless, despite available treatment options, many DFUs progress into chronic, non-healing wounds [3, 4].

Recent studies have identified several factors associated with the development of DFU, including male gender, longer duration of diabetes (exceeding 10 years), advanced age, elevated body mass index, and comorbid conditions such as diabetic retinopathy, peripheral neuropathy, peripheral vascular disease, poor glycemic control (HbA1c), foot deformities, increased plantar pressure, infections, and inappropriate foot self-care practices [3, 4].

Despite the severity of the condition, diabetic foot ulcers have received limited attention in healthcare research, policy formulation, and clinical planning. As a result, management practices are often guided by clinical opinion rather than robust scientific evidence. In addition, the underlying pathological mechanisms of DFU remain inadequately understood, insufficiently emphasized in medical training, and poorly communicated across the multiple clinical disciplines involved in patient care [5].

The global incidence of diabetes mellitus is increasing rapidly and as a result the number of individuals at risk of developing diabetic foot ulcers continues to rise. The lifetime risk of DFU among persons living with diabetes has been estimated to be as high as 25% [6]. Globally, DFUs pose a significant threat, with an estimated 2.5% of individuals with diabetes developing foot lesions annually, of which 14–24% eventually require lower limb amputation [6]. Notably, every 30 seconds, a lower limb is lost somewhere in the world due to diabetes-related complications, with up to 85% of these amputations being preceded by preventable foot ulcers [2, 6].

In Nigeria, approximately 10% of individuals with diabetes experience lower limb complications, with evidence suggesting a steady increase in incidence [7]. Currently, diabetic foot ulcers account for the majority of non-traumatic lower limb amputations carried out in most tertiary healthcare facilities across the country [7, 5]. A study [8, 11] conducted at Ahmadu Bello University Teaching Hospital, Zaria, Kaduna State, reported a relatively low DFU prevalence of 6%, with most cases occurring among individuals aged 51–60 years and a higher prevalence among males. Conversely, a study carried out in two federal hospitals in Kano State reported a higher prevalence of 14.5%, with more cases observed among females than males [8].

Similarly, amputation remains one of the most severe outcomes of diabetic foot ulcers. It has been reported that between 52% and 68% of diabetic patients who undergo amputation experience persistent frailty, impaired mobility, and a marked reduction in life expectancy [1]. Lower extremity amputations occur more frequently among individuals with diabetes than among those without the disease [3, 4].

Furthermore, a study [9] demonstrated that the cost of medical care is significantly higher for diabetic patients with foot ulcers compared to those without DFUs. The high cost of treatment has contributed to delayed hospital presentation, with many individuals resorting to traditional remedies and seeking formal medical care only at advanced stages when therapeutic options are limited.

Diabetic foot ulceration remains a devastating complication of diabetes mellitus and a major contributor to diabetes-related morbidity and mortality. Despite this, there is a paucity of published data on the frequency and determinants of diabetic foot ulcers among diabetic patients receiving care at tertiary hospitals in poor resource setting. Therefore, this study aims to x- ray the frequency and determinants of diabetic foot ulcers among patients with diabetes mellitus accessing healthcare services in a tertiary hospital.

2. Method and Materials

2.1. Research Design

This study adopted a retrospective research design

2.1.1. Study Site

The study was conducted at Abia State University Teaching Hospital (ABSUTH), Aba, Abia State. Abia State is situated in the South-Eastern geopolitical zone of Nigeria. It shares boundaries with Imo State to the west, Cross River State to the east, Rivers State to the south, Anambra State to the northwest, and Enugu and Ebonyi States to the northeast. The state occupies a landmass of approximately 6,320 square kilometers and has an estimated population of 4.143 million people [10].

2.1.2. Target Population

The target population comprised diabetic patients who have received medical care for diabetic foot ulcers at Abia State University Teaching Hospital, Aba, Abia State.

2.1.3. Sample size Determination

In this research, the sample size was determined using the Taro Yamane formula to ensure adequate representation of the target population.

$$N = N / (1 + N(e)^2)$$

Where N = number of people in the population

e = allowable error i.e. 0.05

Substituting numbers into the formula.

$$\begin{aligned} n &= 210 / 1 + 152(0.0025) \\ &= 210 / 1.38 \\ &= 152 \end{aligned}$$

2.2. Sampling Technique

A systematic sampling technique was employed for this study. The first folder was selected by random sampling and from then onward every 3rd folder on the list was selected till a sample of 152 folders was achieved.

2.3. Instrument for Data Collection

Data for this study were obtained from administrative hospital records covering the period from July 2024 to December 2024. Information was extracted using a structured research proforma designed by the researchers. The proforma was used to collect relevant data from past health records of both male and female diabetic patients attending the medical outpatient clinic of the Endocrinology Department at Abia State University Teaching Hospital, Aba, Abia State.

2.4. Validity of the Instrument

The research instrument was subjected to expert review (face and content validity) to ensure its validity. The expert examined the proforma for clarity, relevance, and adequacy, and necessary corrections and suggestions were incorporated into the final version of the instrument prior to data collection.

2.5. Reliability of the Instrument

In this study, the information obtained from past health records using the research proforma was considered reliable, as the data were derived from documented clinical records routinely used in patient management.

3. Method of Data Collection

Data were collected retrospectively using the research proforma to extract information from the medical records of diabetic patients attending the endocrinology clinic under the medical outpatient department. Records reviewed covered a six-month period from July 2024 to December 2024 and were used to determine the number of diabetic patients diagnosed with diabetic foot ulcers.

3.1. Method of Data Analysis

Data obtained from the study were analyzed using simple descriptive statistics, specifically the percentage method, which allows for ease of interpretation and clear presentation of findings and Chi square test. The level of significance was set at 95% confidence interval ($p < 0.05$).

3.2. Ethical Considerations

Ethical approval for this study was obtained from the Head of the Department of Nursing Sciences, Tansian University. Permission was granted after a clear explanation of the purpose and relevance of the study. All information obtained from hospital records was treated with strict confidentiality and anonymity, and the data were used solely for academic and research purposes.

4. Results

The researcher adopted frequency tables and percentages in representing data from past medical records.

Table 1 Overall demographic data of the diabetic patients selected for this research using a research proforma.

S/N	Demographics	Total	Frequency%
1	Age: 40-49	26	17.1
	50-59	69	45.3
	60+	57	37.5
2	Sex: Males	85	55.9
	Females	67	44.1
3	Marital Status: Married	104	68.4
	Single	18	11.8
	Widowed/Divorced	30	19.7
4	Level of Education: Educated	43	28.3
	Uneducated	109	71.7

This table illustrates that from 152 Diabetic Patients systematically selected for this research, most are uneducated (71.7%), and few are educated (28.3%)

Also, diabetes mellitus has an increased proportion of people in the age bracket of 50-59 years (45.3%), slightly high in 60+ age bracket (37.5%) and less in 40-49 years (17.1%).

There is a higher proportion of males (55.9%) than females (44.1%) with diabetic mellitus and most are married (68.4%); others are divorced or widowed (19.7%), while few are single (11.8%).

Table 2 Occurrence of Diabetic Foot Ulcer among Diabetic Patients attending in Abia State University Teaching Hospital, Aba, Abia State

Month	Total Diabetic Patients	Total Diabetic Foot Ulcer Patients	Relative Frequency%
July	33	4	12.1
August	27	2	7.4
September	24	1	8.3
October	22	3	13.6
November	30	5	16.7

December	16	1	6.25
Total Prevalence of DFU (%)	152	16	10.5

The table shows that out of 152 diabetic patients included in this retrospective study; Diabetic Foot Ulcer occurred in 16 diabetic patients which results to a prevalence rate of 10.5%. It also implies that there is a moderate prevalence of diabetic foot ulcer in Abia State University Teaching Hospital.

This finding indicates that, DFU is not the most common complication among diabetic patients in this setting, but it represents a significant burden.

Table 3 Sex distribution and Frequency of diabetic foot ulcer among diabetic patients at ABSUTH.

Sex	Total Diabetic Patients	Total Diabetic foot ulcer patients	Frequency%
M	85	11	12.9
F	67	5	7.5

The table shows that among the 85 male diabetic patients, Diabetic Foot Ulcer occurred in 11 (12.9%) while among 67 female diabetic patients, Diabetic Foot Ulcer occurred in 5 (7.5%).

The difference in prevalence by sex was not statistically significant ($\chi^2=1.19$, $p=0.275$; Fisher's exact $p=0.302$, $p>0.05$). This implies that diabetic foot ulcer is slightly more prevalent in males than females.

Table 4 Frequency of diabetic foot ulcer among diabetic patients in ABSUTH, stratified by age group

Age Brackets	Total Diabetic Patients	Total Diabetic Foot Ulcer Patients	Frequency%
40-49 years	26	2	7.7
50-59 years	69	9	13.0
60+years	57	5	8.8

The table shows that 26 patients are aged 40-49, and Diabetic foot ulcer occurred in 2(7.7%). Among 69 patients aged 50-59 years, Diabetic Foot Ulcer occurred in 9(13.0%), while in 57 patients with aged 60+ years, 5(8.8%) were diagnosed of Diabetic Foot Ulcer.

Although the highest proportion of DFU cases was observed in the 50-59 years age group, statistical comparison showed no significant difference between age group and DFU occurrence ($\chi^2_{test}=0.87$, $p=0.647$, $p>0.05$).

5. Discussion

The prevalence of diabetic foot ulcer observed in this study (10.5%) is comparable to figures reported in several Nigerian tertiary healthcare facilities. A study [8] reported a prevalence of 14.5% at a Federal Hospital in Kano State, while another study [11] documented a lower prevalence of 6% at Ahmadu Bello University Teaching Hospital, Zaria, Kaduna State, Nigeria.

Within Africa, a study [12] reported a prevalence of 8.7% from a retrospective study conducted in a tertiary hospital in Accra, Ghana, while another study [5] reported a higher prevalence of 15% in three major hospitals in Somalia, Sub-Saharan Africa. These studies consistently demonstrated that DFUs contribute substantially to hospital admissions, amputations, and mortality among diabetic patients.

Globally, a study [13] showed a DFU prevalence of 14.8% in Afghanistan, similarly, a study [14] reported 10.4% in Ethiopia, while another study [15] documented a prevalence of 14.2% in India. Collectively, studies conducted within the past five years indicate that DFU prevalence in Nigerian tertiary hospitals ranges between 6% and 14%, a pattern similar to findings across Africa and other regions of the world.

Also, the current study demonstrated a higher prevalence of DFU among male patients compared to females, although the difference was not statistically significant. This finding aligns with reports by a study [11] that documented more cases among males in Zaria, and another study [16] which reported a similar trend at FMC Umuahia. A study [12] further showed that male diabetic patients were 3.4 times more likely to develop DFU than females in Ghana. Also, globally, a study [13] observed male predominance in Afghanistan.

In terms of age distribution, the highest prevalence of DFU was observed among patients aged 50–59 years. Similar findings have been reported in a study [11] from Nigeria, which documented the highest DFU prevalence among patients aged 51–60 years. Conversely, a study [14] reported higher prevalence among patients aged 61–70 years, with a significant association between age and ulcer development. Another study [13] also identified the highest prevalence among patients aged 58–67 years.

These findings reinforced the report [17] that called for the strengthening of primary healthcare systems and nurse-led interventions in diabetes management. Across Nigeria, Ghana, and other countries where DFU research has been conducted, moderate prevalence rates have been consistently reported. A study [11] further noted that the global prevalence of DFU ranges between 3% and 13%, with only a few studies reporting values above this range.

6. Conclusion

This study concludes that diabetic foot ulcer remains a significant health challenge among diabetic patients attending Abia State University Teaching Hospital. Although the observed prevalence of 10.5% is relatively moderate, it still represents a substantial clinical burden. The findings demonstrate that DFU is not confined to elderly patients but also affects middle-aged individuals in their productive years, with a higher occurrence among males.

Recommendations

- Routine foot assessments should be conducted for all diabetic patients during clinic visits to facilitate early identification of DFU.
- Continuous health education on foot care and hygiene should be prioritized, particularly for male and middle-aged patients.
- Tertiary hospitals should establish diabetic foot care clinics for wound management, education, and follow-up.
- Preventive interventions, including glycemic control and lifestyle modification education, should be strengthened.
- Regular training workshops should be organized to enhance competencies in diabetic foot management.
- The hospital should develop and implement standardized protocols for DFU screening and documentation.

Compliance with ethical standards

Disclosure of conflict of interest

There is no conflict of interest whatsoever in this research work

Statement of informed consent

Informed consent was obtained and information obtained from the facility was treated with strict confidentiality and anonymity

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