

A PROSPECTIVE OBSERVATIONAL STUDY TO ASSESS AND TREAT DIABETIC FOOT ULCERS AT MULTI-SPECIALTY HOSPITALS

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Abstract

Background: Diabetes-related foot ulcers are a significant public health issue, particularly in underdeveloped nations. The main difficulty facing surgeons nowadays is managing diabetic foot ulcers. **Objective:** To describe the surgical management of Diabetic foot ulcers and to determine various risk factors associated with DFUs. **Material & Methods:** A Prospective Observational Study was conducted at Multi- speciality hospitals for 2 years from February 2021 to January 2022. Purposive sampling technique was used and all the patients with diabetic foot ulcer attended the hospital were taken as separate sampling unit and were considered as total sample size of the study which was found to be 100. All the collected data was analyzed by the Epi-info 7 software. **Results:** A total of 100 DFUs patients was included in this study. Among all of them 77.14% were male and 22.86% were female. Most common age group with DFUs was 40-60 years. All the patients of DFUs were belonged to type 2 diabetes mellitus. Most of them are mainly old cases (75%). Duration of DFUs was more than 8 weeks commonly in 40% cases. 90 % has no previous history of DFUs and no amputation. 64% of ulcers were neuropathic and the most common anatomical site was found to be fore foot in 45%. Most of the microorganisms isolated showed multi drug resistance to commonly used antibiotics except for Carbapenems group drugs (sensitivity 100%). Mortality rate was 9.4%. **Conclusion:** The main cause of morbidity and mortality in persons with diabetes mellitus is diabetic foot ulcers. To reduce morbidity and mortality among diabetic foot ulcer patients, effective education on foot care and appropriate footwear, good blood sugar control, and early surgical surgery are required.

INTRODUCTION

One of the main complications of diabetes is diabetic foot, which includes foot ulceration that is linked to neuropathy in a diabetic patient. Diabetes patients who develop diabetic foot ulcers are more likely to die and experience significant morbidity rates.^[1,2] 15–20% of diabetic people will experience foot ulcers at some time in their lives, with many of these being treated surgically. Patients with diabetic foot ulcers are more likely to require lower limb amputations in poor nations.^[3] The majority of diabetic foot ulcers will heal, however 10% to 15% of cases will not heal and require amputation of a limb.^[4] because adequate diagnosis and treatment are still difficult to access in developing nations, diabetic foot ulceration remains a major issue. The majority of patients with diabetic

foot ulcers who are admitted to the hospital have advanced foot ulcers, which is a major management challenge.^[5] Due to inadequate knowledge of diabetic healthcare, sociocultural factors, and low socioeconomic position, DFUs are admitted to hospitals later than expected.

Several studies have shown that surgical procedures for DFUs with gangrene may be too late to prevent death. Therefore, it is necessary early demonstration by patients and proper surgical procedures should apply during primary stages of ulcer, which may improve quality of life in patients and reduce mortality rate.⁶ Management of DFUs involve multidisciplinary approach, therefore the rationale behind the study was to describe surgical management of DFUs, various risk factors associated with it.

MATERIALS AND METHODS

A Prospective Observational Study was conducted at Multi- speciality hospitals for 2 year from February 2021 to January 2022. Purposive sampling technique was used and all the patients with diabetic foot ulcer attended the hospital were taken as separate sampling unit and were considered as total sample size of the study which was found to be 100.

Inclusion Criteria

The patients with diabetic foot ulcers attended in hospital were included in this study.

Exclusion Criteria

Diabetic patients but no foot ulcer was excluded.

Consent Type

Written informed consent

Methodology

The patients' complete medical histories were documented. For each patient, a correct clinical diagnosis was made, taking into account factors including the patient's awareness of the foot ulcer's duration, type of diabetes (type I or type II), anti-diabetic medication, type of DFU, and numerous comorbid illnesses. For each patient, several clinical laboratory tests were performed.

Statistical Analysis

Data will be consolidated and entered a Microsoft Excel spreadsheet and then transferred to Epi info version (7.1.3.0. centre for disease control and prevention, Atlanta, Georgia, USA, 2013) software for analysis. Frequency tables are in the form of

percentages. Chi- square and unpaired t- test were used for analysis.

RESULTS

As per table 1 all the patients of DFUs were belonged to type 2 diabetes mellitus. Most of them are mainly old cases (75%). Duration of DFUs was more than 8 weeks commonly in 40% cases. 90 % has no previous history of DFUs and no amputation. 64% of ulcers were neuropathic and the most common anatomical site was found to be fore foot in 45% [Table 1].

In table 2 the majority of cases surgically (76%) and remaining 24% were treated with daily dressings and antibiotics. Out of 77 cases, 76% patients were treated by lower limb amputations. Skin grafting, incision and drainage was done for 4% and 2% patients respectively (P value 0.012) [Table 2].

After the surgical procedure the most common post - operative complication was found to be Surgical Site infection in 50% cases followed by gangrene in 16%. Phantom pain was seen in 14% cases while anemia and wound haematoma were seen in 8% cases [Table 3].

16 out of 24 (62.5%) cultured specimens had positive bacterial growth after 48 hours of aerobic incubation. 9 cultures had polymicrobial (60%) growth and 40% had pure growth. The most common bacterial isolates were staphylococcus aureus in 10 cases, followed by e.coli in 6 cases [Table 4].

Table 1: Clinical Characteristics of Diabetic Foot ulcers patients

| Characteristics | Number | % |
|--------------------------------|--------|-----|
| Type of Diabetes | | |
| Type 1 | 0 | 0 |
| Type 2 | 100 | 100 |
| Duration of Diabetes | | |
| Old cases | 75 | 75 |
| New cases | 25 | 25 |
| Duration of DFUs | | |
| 1-4 weeks | 22 | 22 |
| 4-8 weeks | 38 | 38 |
| >8 weeks | 40 | 40 |
| Previous history of DFU | | |
| Yes | 10 | 10 |
| No | 90 | 90 |
| Previous history of amputation | | |
| Yes | 10 | 10 |
| No | 90 | 90 |
| Type of ulcer | | |
| Neuropathic | 64 | 64 |
| Ischemic | 34 | 34 |
| Neuro-ischemic | 2 | 2 |
| Anatomical site | | |
| Toe | 35 | 35 |
| Fore foot | 45 | 45 |
| Foot sole | 20 | 20 |

Table 2: Surgical Procedures performed

| Procedure | Number (N=77) | % |
|-----------------------|---------------|----|
| Lower Limb Amputation | 55 | 76 |
| Debridement | 15 | 18 |
| Skin grafting | 3 | 4 |
| Incision and drainage | 2 | 2 |

Table 3: Post-Operative complications

| Complications | Number (N=50) | % |
|-------------------------|---------------|----|
| Surgical site infection | 25 | 50 |
| Gangrene | 8 | 16 |
| Phantom pain | 7 | 14 |
| Wound haematoma | 4 | 8 |
| Anemia | 4 | 8 |
| Skin grafting failure | 2 | 4 |

Table 4: Bacterial Growth pattern in Diabetic foot ulcers

| Isolated organism | Number (N=20) | % |
|-----------------------|---------------|----|
| Staphylococcus aureus | 10 | 50 |
| E.coli | 6 | 30 |
| Kleibisella spp | 2 | 10 |
| Proteus | 1 | 5 |
| Pseudomonas | 1 | 5 |

DISCUSSION

The most significant issue on the planet is diabetic foot ulcers, which are more prevalent in underdeveloped nations than wealthy ones. Similar to prior studies, the present study found that men were more negatively impacted than women.^[8,9] The majority of the patients were in the 40–60 age range. These results agreed with those of other investigations. According to other studies, the majority of patients (76.86%) came from rural backgrounds. Males were more affected than females, possibly as a result of their drinking and smoking rates of 22.3% and 52.3%, respectively.^[10] Two of the biggest risk factors for developing diabetic foot ulcers are smoking and alcohol consumption.

According to the present study duration of diabetes was much longer in patients with diabetes foot ulcer that may be due to the loss of proper diabetic care. Similar findings were reported by other authors.^[12,13] In the current study, the majority of patients arrived to the surgical department between 4 and 32 weeks after the beginning of an ulcer. Other investigations showed comparable data.^[8,9] According to Alnour AM et al. and Mahboob G et al., the incidence ranged from 42% to 68%, which was considerably higher.^[12,13] Doumi A reported 74% of high percentages of advanced foot ulcers.^[8] 52.86% of the DFUs patients in the current study had surgical procedures. 60% of these individuals had their lower limbs amputated, which is more than the other studies indicate. The late presentation and severity of the illness in the current study may have contributed to the greater amputation rate. Staphylococcus aureus and Escherichia coli predominated among the 60% polymicrobial bacterial isolates found in the microbiological analysis. Other research have shown similar results.^[8] The bacterial isolates included in this investigation all exhibited multi-drug resistance, with the exception of the carbapenem drug group, which was 100% susceptible to every isolate.

CONCLUSION

The main cause of illness and mortality in people with diabetes is diabetic foot ulcers. The biggest issue for the surgeon is management. To lower the morbidity and mortality rates among diabetic foot ulcer patients, excellent glycemic management, foot care with suitable foot wear, diabetes education, infection control, and appropriate surgical intervention are required.

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