



A STUDY ON THE TREATMENT OUTCOMES IN DIABETIC FOOT ULCER EVALUATING INTERVENTIONS EFFICACY ACROSS SEVERITY IN DIFFERENT AGE AND GENDER

Hika Aye*

Doctor Of Pharmacy (post Baccalaureate), Department Of Pharmacy
Annamalai University, Chidambaram *Corresponding Author

**Dr. N Junior
Sundresh**

Medical Superintendent, M.s. General Surgery, Fracs., Mba Hospital
Administration. Government Cuddalore Medical College And Hospital,
Chidambaram, Tamil Nadu

Dr. C. K. Dhanapal

M. Pharm., Ph.d. Professor, Coordinator–pharm. D Program, Department Of
Pharmacy, Faculty Of Engineering And Technology Annamalai University

ABSTRACT

Background: Diabetic foot ulcers (DFUs) pose a significant challenge in diabetes management, contributing to substantial morbidity and mortality globally. Despite various treatment modalities, there is a need to explore the efficacy of interventions across different demographic and clinical parameters. **Objective:** This prospective observational study aimed to assess treatment outcomes in diabetic foot ulcers (DFUs) and evaluate the efficacy of interventions across different demographic and clinical parameters. **Methods:** Data from 64 patients diagnosed with DFUs at Government Cuddalore Medical College and Hospital over a three-month period were analyzed prospectively. Various treatment modalities, patient demographics, ulcer characteristics, and treatment outcomes were assessed using descriptive statistics. **Results:** The study revealed a male predominance (75%) among DFU patients, with varying durations of diabetes and ulcer locations. Gram-negative bacilli were the most common pathogens (50%), with debridement being the most frequently used treatment modality (50%). While 56.3% of patients achieved partial or complete wound healing, 25% required amputation, and 18.8% experienced non-healing outcomes. **Conclusion:** Despite effective treatment modalities, diabetic foot ulcers remain a significant healthcare challenge, with notable disparities in treatment outcomes based on demographic and clinical factors. Tailored interventions and increased awareness targeting vulnerable populations are needed to improve DFU management and reduce amputation rates.

KEYWORDS : Diabetic foot ulcers, treatment outcomes, intervention efficacy, demographic factors, clinical parameters.

INTRODUCTION

Diabetic foot ulcers (DFUs) represent a significant complication of diabetes mellitus, contributing to substantial morbidity and mortality rates worldwide. Despite advances in medical care, DFUs remain a challenging clinical entity with considerable economic and healthcare burdens. Effective management of DFUs requires a multidisciplinary approach and often involves various treatment modalities tailored to individual patient characteristics.

While numerous studies have investigated treatment strategies for DFUs, there remains a need for further exploration into the efficacy of these interventions, particularly concerning their outcomes across different patient demographics and ulcer severity levels. Understanding how treatment outcomes vary based on factors such as age, gender, and ulcer severity can help optimize patient care and resource allocation in clinical practice. This prospective analysis aims to evaluate the efficacy of different interventions in the management of DFUs and assess how treatment outcomes are influenced by patient characteristics, including age and gender, as well as ulcer severity. By examining a diverse patient population over a specified time, this study seeks to provide valuable insights into the real-world effectiveness of DFU treatments and identify factors that may impact clinical outcomes. The findings of this study have the potential to inform clinical decision-making, guide treatment selection, and ultimately improve the quality of care for patients with diabetic foot ulcers. Additionally, identifying disparities in treatment outcomes based on demographic and clinical factors can aid in the development of targeted interventions to address the specific needs of vulnerable patient populations. This introduction outlines the significance of the study, the research problem, and the objectives, providing a clear roadmap for the reader to understand the rationale and scope of your prospective analysis.

Aims And Objective

Aim:

To study on the outcomes in diabetic foot ulcer evaluating intervention efficacy across severity in different age group and sex.

Objective:

1. To assess the effectiveness of various treatment interventions in promoting the healing of diabetic foot ulcers;
2. To examine the impact of patient demographics, including age and gender, on treatment outcomes.
3. To evaluate the association between ulcer severity and treatment response.
4. To identify disparities in treatment outcomes among different demographic and clinical subgroups.

Methodology

This study is a prospective Observational Descriptive Study conducted among 64 confirmed cases of Diabetic Foot Ulcers, from the Department of Surgery, Govt. Cuddalore Medical College and Hospital (Erst Rajah Muthiah Medical College), Chidambaram, Tamil Nadu, India. During the study, case sheets with the diagnosis of DFU were considered and the patient with foot ulcer not associated with diabetic and patient who are pregnant or breastfeeding were excluded. The outcomes of the data will be summarized using MS Excel Statistical Tool.

RESULT

Age Wise Distribution

The study revealed that 21 of the participants were classified as middle-aged, while the remaining 43 belonged to the older age group among individuals diagnosed with diabetic foot ulcers.

Gender Wise Distribution

The study demonstrates that among patients with diabetic foot ulcers (DFUs), 25% were classified as middle-aged, while

75% were categorized as old-aged individuals. Additionally, there was a notable male predominance, comprising 75% of the total sample.

Medication Adherence

The data indicates that most patients (64.3%) reported irregular medication intake, while 35.7% adhered to a regular medication regimen.

DFU with or without comorbidities

The presence of comorbidities was analysed within the studied population. It was found that 36 patients had one or more comorbidities, which could potentially complicate their treatment and recovery process. On the other hand, 28 patients were free from any comorbidities, allowing for a clearer assessment of the interventions' efficacy on diabetic foot ulcers without the additional variable of concurrent health conditions. This distinction between patients with and without comorbidities provides valuable insights into how underlying health issues might impact the outcomes of different treatment strategies.

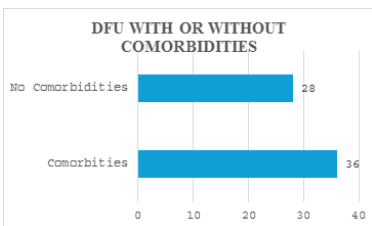


Figure 1 Dfu With Or Without Comorbidities.

Ulcer characteristic location

Most ulcers observed in the study were situated on the toes (43.8%), with the dorsal aspect being the next most common location (37.5%).

Duration of Diabetes Mellitus

The duration of diabetes mellitus exhibited significant variability among patients, with 10 years being the most prevalent duration, observed in 25% of the patients. A substantial proportion of patients (25%) had a diabetic history spanning 5 years, followed by 12.5% with a duration of 1 year, and 6.25% with a duration of 20 years.

Bacterial infection

Bacterial infection Gram-negative bacilli were the most common pathogens (50%), followed by gram-positive cocci (6.3%).

Treatment modalities

The primary treatment modality employed in the study was debridement, which was utilized in 50% of the cases. This was followed by surgical intervention, used in 25% of the cases, and antibiotic therapy, which was also applied in 25% of the cases. The utilization of these treatment methods highlights the various approaches taken to manage diabetic foot ulcers, reflecting a balanced use of both conservative and more invasive strategies depending on the individual patient's needs and the severity of their condition.

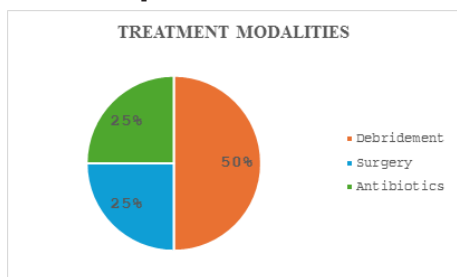


Figure 2 Treatment modalities.

Treatment outcome

In the study examining diabetic foot ulcers, it was found that none of the patients achieved complete healing. Partial healing was observed in 35 patients. In contrast, 12 patients experienced no healing at all. Furthermore, 16 patients had to undergo amputation.

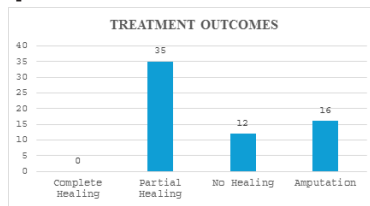


Figure 3 Treatment outcomes.

DISCUSSION

The study highlighted a predominant male representation (75%) among diabetic foot ulcer patients, suggesting a necessity for tailored interventions and heightened awareness efforts aimed at male populations to enhance early detection and management of diabetic complications. Patient exhibited diverse durations of diabetes, with a notable prevalence (25%) at 10 years. Prolonged disease duration correlates with heightened complication risks, emphasizing the significance of early diagnosis and rigorous glycemic control to mitigate adverse outcomes. Most patients (64.3%) reported irregular medication intake, signifying substantial challenges in diabetes management. Poor medication adherence poses a barrier to optimal glycemic control, exacerbating diabetic complications. Additionally, 36 patients presented comorbidities, highlighting the necessity for comprehensive care approaches. Most ulcers were situated on weight-bearing areas such as the toes (43.8%) and dorsal aspect (37.5%). Gram-negative bacilli constituted the prevalent pathogens (50%), with gram-positive cocci following (6.3%). These findings underscore the importance of targeted wound care and antibiotic therapy in diabetic foot ulceration management. Debridement emerged as the predominant treatment modality (50%), trailed by surgery (25%) and antibiotic therapy (25%). Most patients experienced hospital stays lasting 1-7 days (37.5%), indicating effective management of acute complications and the feasibility of outpatient-based care for diabetic foot ulcers. Approximately 56.3% of patients achieved partial or complete wound healing, while 25% necessitated amputation, and 18.8% encountered non-healing outcomes. These figures underscore the persistent challenges in managing diabetic foot ulcers, necessitating multidisciplinary approaches involving various healthcare specialists.

CONCLUSION

The study's identification of a male predominance among DFU patients, particularly within older age groups, is noteworthy. Additionally, the observed variability in the duration of diabetes mellitus among patients highlights the multifactorial nature of DFU development and progression. The study's recognition of poor medication adherence and the presence of comorbidities as significant concerns underscores the necessity for comprehensive care approaches that address both ulcer management and underlying health conditions. Moreover, the study's analysis of ulcer characteristics, including location and bacterial infections, provides valuable insights into the consistent patterns observed in DFU literature. Debridement emerges as a cornerstone treatment modality, highlighting its importance in promoting wound healing by removing necrotic tissue and facilitating tissue regeneration. Surgical intervention and antibiotic therapy also play crucial roles in managing DFUs, particularly in cases where there is significant tissue damage or infection. Despite the implementation of these interventions, the study's findings reveal a sobering reality:

while a considerable proportion of patients achieve partial or complete wound healing, a notable number still require amputation, and a significant minority experience non-healing outcomes. This underscores the complexity of DFU management and the need for a holistic, multidisciplinary approach that addresses the diverse needs of patients. Overall, this study emphasizes the importance of tailored interventions and increased awareness targeting vulnerable populations to improve DFU management and reduce amputation rates. It calls for a concerted effort from healthcare providers, policymakers, and researchers to develop and implement comprehensive care strategies that address the multifaceted challenges associated with DFUs. Additionally, future research endeavors should prioritize longitudinal studies to further elucidate treatment outcomes and explore additional factors influencing DFU prognosis and management strategies. By doing so, we can strive towards better outcomes for individuals living with DFUs and ultimately enhance their quality of life.

REFERENCES

1. Bandyk, D. F. (2018, June). The diabetic foot: Pathophysiology, evaluation, and treatment. In *Seminars in vascular surgery* (Vol. 31, No. 2-4, pp. 43-48). WB Saunders.
2. Chiu, C. C., Huang, C. L., Weng, S. F., Sun, L. M., Chang, Y. L., & Tsai, F. C. (2011). A multidisciplinary diabetic foot ulcer treatment programme significantly improved the outcome in patients with infected diabetic foot ulcers. *Journal of plastic, reconstructive & aesthetic surgery*, 64(7), 867-872.
3. Mir, K. A., Pugazhendhi, S., Paul, M. J., Nair, A., & Ramakrishna, B. S. (2009). Heat-shock protein 70 gene polymorphism is associated with the severity of diabetic foot ulcer and the outcome of surgical treatment. *Journal of British Surgery*, 96(10), 1205-1209.
4. Noor, S., Zubair, M., & Ahmad, J. (2015). Diabetic foot ulcer—a review on pathophysiology, classification and microbial etiology. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews*, 9(3), 192-199.
5. Gong, H., Ren, Y., Li, Z., Zha, P., Bista, R., Li, Y., ... & Wang, C. (2023). Clinical characteristics and risk factors of lower extremity amputation in the diabetic inpatients with foot ulcers. *Frontiers in Endocrinology*, 14, 1144806.
6. Reardon, R., Simring, D., Kim, B., Mortensen, J., Williams, D., & Leslie, A. (2020). The diabetic foot ulcer. *Australian Journal of General Practice*, 49(5), 250-255.
7. Rosboth, S., Lechleitner, M., & Oberaigner, W. (2021). Risk factors for diabetic foot complications in type 2 diabetes—a systematic review. *Endocrinology, Diabetes & Metabolism*, 4(1), e00175.
8. Wagner Jr, F. W. (1981). The dysvascular foot: a system for diagnosis and treatment. *Foot & ankle*, 2(2), 64-122.