A COMPARITIVE STUDY ON PHENYTOIN DRESSING VS SALINE DRESSING FOR DIABETIC FOOT ULCER IN A TERRITIARY CARE CENTER

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Abstract

Background: Diabetic foot ulcers (DFUs) are among the most serious complications of diabetes mellitus and are associated with prolonged hospitalization, infection, and lower limb amputation. Conventional saline dressing is widely used for wound management; however, topical phenytoin has emerged as a potential alternative because of its wound healing, angiogenic, and antibacterial properties.

Aim: To compare the effectiveness of topical phenytoin dressing with conventional saline dressing in the management of diabetic foot ulcers.

Methods: This comparative cohort study was conducted among 30 patients with diabetic foot ulcers admitted to a tertiary care hospital. Patients were allocated into two equal groups: saline dressing (n=15) and topical phenytoin dressing (n=15). Clinical outcomes including healing time, wound closure rate, pain score, and complications were evaluated over the follow-up period. Statistical analysis was performed using independent t-test and Chi-square test, with $p<0.05$ considered statistically significant.

Results: The mean healing time was significantly lower in the phenytoin group than in the saline group (47 vs. 52 days; p=0.040). The mean wound closure rate was higher with phenytoin (81.5%) than saline (77.5%), although the difference was not statistically significant (p=0.350). The phenytoin group demonstrated significantly lower pain scores (4.5 vs. 5.5; p=0.030) and a lower complication rate (13.3% vs. 26.7%; p=0.580). Overall, patients receiving phenytoin dressing showed faster healing, improved patient comfort, and fewer wound-related complications.

Conclusion: Topical phenytoin dressing was more effective than conventional saline dressing in promoting wound healing and reducing pain among patients with diabetic foot ulcers. Although differences in wound closure and complication rates were not statistically significant, the overall clinical outcomes favored phenytoin, suggesting that it is a safe, effective, and economical alternative dressing for diabetic foot ulcer management.

Keywords: Diabetic foot ulcer, Topical phenytoin, Saline dressing, Wound healing, Wound management.

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1. Introduction

Diabetes mellitus is a major global public health challenge and one of the leading causes of chronic morbidity and mortality worldwide. It is characterized by persistent hyperglycemia resulting from defects in insulin secretion, insulin action, or both, leading to abnormalities in carbohydrate, protein, and fat metabolism. Prolonged hyperglycemia causes both microvascular and macrovascular complications that significantly affect multiple organ systems and contribute to long-term disability and reduced survival. Among these complications, diabetic foot ulcer (DFU) is one of the most serious because it is associated with prolonged hospitalization, recurrent infections, impaired quality of life, increased healthcare costs, and a high risk of lower limb

amputation. The growing prevalence of diabetes has consequently increased the burden of diabetic foot disease, making its effective management a major concern in modern surgical practice. [1,2]

A diabetic foot ulcer is defined as a full-thickness wound occurring below the ankle in an individual with diabetes. The development of these ulcers is multifactorial and commonly results from peripheral neuropathy, peripheral arterial disease, impaired immunity, repetitive trauma, and poor glycemic control. Peripheral neuropathy causes loss of protective sensation, allowing minor injuries to remain unnoticed, while vascular insufficiency reduces tissue perfusion and delays wound healing. Diabetes also impairs leukocyte function and inflammatory responses, increasing susceptibility to infection. The interaction of these factors results in chronic non-healing wounds that may progress to deep infection, gangrene, and eventual limb loss if not treated promptly. [3,4]

Diabetic foot ulcers have profound physical, psychological, and socioeconomic consequences. Persistent pain, reduced mobility, dependence on caregivers, repeated hospital admissions, and loss of productivity significantly affect patients' quality of life. Chronic ulcers frequently require repeated dressing changes, prolonged antibiotic therapy, surgical debridement, and, in advanced cases, reconstructive procedures or amputation. Lower extremity amputation remains one of the most devastating complications of diabetic foot disease and is associated with increased mortality and permanent disability. Therefore, early diagnosis, infection control, pressure offloading, meticulous wound care, and optimization of systemic factors are essential components of comprehensive diabetic foot management. [5,6]

Wound healing is a complex biological process involving hemostasis, inflammation, proliferation, and tissue remodeling. Diabetes adversely affects each of these stages by impairing angiogenesis, fibroblast proliferation, collagen synthesis, epithelialization, and extracellular matrix formation. Persistent hyperglycemia further promotes oxidative stress, chronic inflammation, and bacterial colonization, thereby delaying tissue repair. Consequently, diabetic wounds often remain in the inflammatory phase for prolonged periods and fail to heal adequately. Appropriate wound dressings play a crucial role in promoting healing by maintaining a moist environment, reducing bacterial contamination, absorbing wound exudate, and encouraging healthy granulation tissue formation. [7]

An ideal wound dressing should be safe, non-toxic, inexpensive, readily available, easy to apply, non-adherent, and capable of promoting tissue regeneration while minimizing infection. Normal saline dressing has long been regarded as the conventional method of wound care because it effectively cleanses wounds without causing tissue damage and helps maintain adequate wound moisture. However, saline possesses no intrinsic antimicrobial or tissue-stimulatory properties, and healing may therefore be slower in chronic diabetic wounds that require enhanced cellular activity and granulation tissue formation. [8]

Phenytoin, originally developed as an anticonvulsant drug, has gained attention as a topical wound-healing agent because one of its well-known adverse effects is gingival hyperplasia, suggesting its ability to stimulate connective tissue growth [9]. Experimental evidence indicates that topical phenytoin enhances fibroblast proliferation, collagen deposition, angiogenesis, and granulation tissue formation while reducing bacterial contamination and collagenase activity. These biological properties make phenytoin a promising dressing material for chronic wounds, including diabetic foot ulcers. In addition, phenytoin is inexpensive, readily available, and easy to use, making it particularly suitable for resource-limited healthcare settings. Faster wound healing may reduce hospital stay, treatment costs, and the need for surgical interventions, thereby improving overall patient outcomes. [10] Management of diabetic foot ulcers requires a multidisciplinary approach involving optimal glycemic control, infection management, vascular assessment, pressure offloading, nutritional support, patient education, and regular wound care. In developing countries, delayed presentation, limited healthcare resources, and poor socioeconomic conditions further increase the burden of diabetic foot disease. Therefore, identifying affordable and effective dressing materials remains an important clinical priority. Comparative evaluation of phenytoin dressing and conventional saline dressing may provide valuable evidence regarding wound healing, granulation tissue formation, infection control, and overall treatment outcomes. Such evidence may help optimize wound care practices and improve limb preservation and quality of life among patients with diabetic foot ulcers treated in tertiary care centers.

2. Methodology

2.1 Study Design

The present study was conducted as a **prospective comparative cohort study**

2.2 Study Setting

The study was carried out in the **Department of General Surgery, Shri Sathya Sai Medical College and Research Institute**, a tertiary care teaching hospital.

2.3 Study Duration

The study was conducted over a **three-month period from January 2024 to April 2024**.

2.4 Participants

Inclusion Criteria

- Adults aged **30–70 years**.
- Patients diagnosed with **Type 1 or Type 2 diabetes mellitus**.
- Patients presenting with diabetic foot ulcers suitable for conservative dressing management.
- Patients with adequately controlled blood glucose levels.
- Patients willing to provide written informed consent.
- Patients available for regular follow-up during the study period.

Exclusion Criteria

- Patients with infected ulcers requiring immediate surgical intervention.
- Patients with osteomyelitis or extensive gangrene.
- Patients with known hypersensitivity to phenytoin.
- Patients receiving corticosteroids, immunosuppressive therapy, or anticancer drugs.
- Patients with severe peripheral vascular disease requiring vascular surgery.
- Pregnant or lactating women.
- Patients unwilling to participate in the study.

2.5 Study Sampling

A **consecutive sampling technique** was employed for patient recruitment. All eligible patients presenting to the Department of General Surgery during the study period were screened according to the inclusion and exclusion criteria. Patients fulfilling the eligibility criteria were enrolled consecutively until the required sample size was achieved. This sampling method minimized selection bias and ensured that all eligible patients attending the hospital during the study period had an equal opportunity to participate.

2.6 Study Sample Size

The study included a total of **30 patients** with diabetic foot ulcers. The sample consisted of patients who fulfilled the eligibility criteria and consented to participate. Equal allocation was maintained between the treatment groups, with **15 patients receiving topical phenytoin dressing** and **15 patients receiving conventional normal saline dressing**. The sample size was determined based on feasibility, patient availability during the study period, and institutional resources for conducting prospective follow-up.

2.7 Study Groups

Participants were allocated into two treatment groups. **Group I (Saline Dressing Group):** Fifteen patients received conventional sterile normal saline dressing. Following wound cleansing and debridement, sterile saline-soaked gauze was applied over the ulcer, and dressings were changed every **48–72 hours** according to institutional wound care protocol.

Group II (Topical Phenytoin Dressing Group): Fifteen patients received topical phenytoin dressing. After wound cleansing and surgical debridement when required, phenytoin-impregnated sterile gauze dressing was applied directly over the ulcer surface. Dressings were similarly changed every **48–72 hours** throughout the treatment period.

All patients in both groups received standard diabetic foot care including glycemic control, antibiotics when indicated, pressure off-loading, nutritional advice, and routine surgical evaluation.

2.8 Study Parameters

The study evaluated several clinical parameters to compare the effectiveness of phenytoin dressing and normal saline dressing in the management of diabetic foot ulcers. Baseline characteristics included the patients' age, gender, and the initial ulcer size measured in square centimeters (cm^2), which were recorded before initiating treatment to ensure comparability between the study groups. The primary outcome assessed was the wound healing time, measured in days from the initiation of treatment until complete wound healing. Secondary outcome measures included the percentage of wound closure rate, which was calculated to determine the extent of reduction in ulcer size during the treatment period, and pain intensity, which was assessed using the 10-point Visual Analogue Scale (VAS). The occurrence of wound-related complications, including infection and wound dehiscence, was also documented throughout the follow-up period. In addition, the overall clinical outcome was evaluated based on the progress of wound healing, presence of complications, and the patient's response to the assigned dressing modality.

2.9 **Study Procedure**

After obtaining informed consent, demographic details and relevant clinical history were recorded using a structured proforma. Baseline wound assessment included measurement of ulcer dimensions, documentation of ulcer characteristics, and evaluation for infection or necrotic tissue. Surgical debridement was performed whenever necessary before initiation of dressing therapy.

Patients allocated to the saline group received conventional sterile saline dressings, whereas patients in the phenytoin group received topical phenytoin dressings under aseptic precautions. Dressings were changed every 48–72 hours according to the wound condition. At each follow-up visit, wound size, granulation tissue formation, pain score, and evidence of infection or other complications were assessed. Healing progression was documented photographically and clinically until satisfactory wound healing or completion of the follow-up period. Patients also continued to receive standard diabetic management, including optimization of glycemic

control and systemic antibiotic therapy whenever clinically indicated.

2.10Study Data Collection

Data were collected using a **pre-designed structured case record form**. Baseline demographic characteristics, medical history, ulcer characteristics, treatment details, wound measurements, pain scores, healing duration, and complications were recorded during each follow-up visit. Ulcer dimensions were measured using a sterile measuring scale, while pain severity was assessed using the Visual Analogue Scale (VAS). Data collection was performed by the investigators to maintain uniformity and minimize observer variation. All collected data were verified for completeness before statistical analysis.

2.11Data Analysis

The collected data were entered into Microsoft Excel and analyzed using Statistical Package for the Social Sciences (SPSS) software version 26.0. Continuous variables were expressed as mean ± standard deviation (SD), whereas categorical variables were presented as frequency and percentage. The Independent Student's *t*-test was used to compare continuous variables such as healing time, wound closure rate, and pain score between the two groups. The Chi-square test or Fisher's exact test was used for comparison of categorical variables including complications. A **p-value less than 0.05** was considered statistically significant.

2.12Ethical Considerations

Prior to commencement of the study, approval was obtained from the Institutional Ethics Committee of Shri Sathya Sai Medical College and Research Institute. The study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki and Good Clinical Practice guidelines.

3. Results

A total of **30** patients with diabetic foot ulcers were included in the study. Patients were equally allocated into two treatment groups, with 15 patients receiving saline dressings and 15 patients receiving phenytoin dressings. The clinical outcomes including healing time, wound closure rate, complications, pain score, and treatment effectiveness were compared between the two groups.

Table 1. Demographic Characteristics of Study Participants (N=30)

Variable	Saline (n=15)	Phenytoin (n=15)	Total (N=30)
Age (Mean ± SD)	60.4 ± 4.3	59.1 ± 7.8	59.8 ± 6.2
Male	9 (60.0%)	7 (46.7%)	16 (53.3%)
Female	6 (40.0%)	8 (53.3%)	14 (46.7%)

The mean age of patients was comparable between both treatment groups. The saline group had a slightly higher proportion of males (60.0%), whereas females were slightly more common in the phenytoin group (53.3%). Overall, males constituted 53.3% of the study population.

Table 2. Baseline Ulcer Size

Initial Ulcer Size	Saline (n=15)	Phenytoin (n=15)	Total
<5 cm²	4 (26.7%)	3 (20.0%)	7 (23.3%)
5–8 cm²	7 (46.7%)	8 (53.3%)	15 (50.0%)
>8 cm²	4 (26.7%)	4 (26.7%)	8 (26.7%)

Half of the study participants presented with ulcers measuring **5–8 cm²**, while approximately one-fourth had ulcers larger than 8 cm². Baseline ulcer size distribution was similar between both treatment groups, indicating comparable disease severity before treatment.

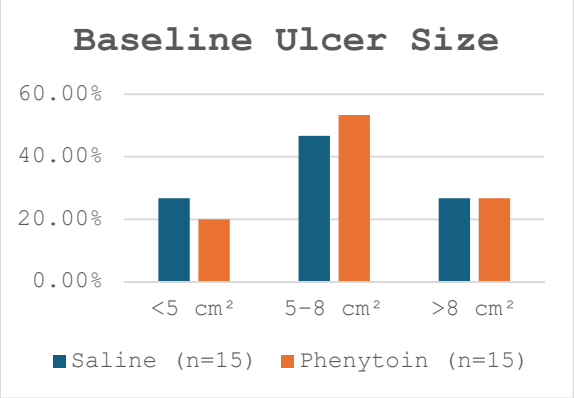

Table 3. Comparison of Healing Time

Parameter	Saline	Phenytoin	p-value
Mean Healing Time (days)	52.0 ± 10.5	47.0 ± 9.8	0.040*

*Significant (p<0.05)

Patients treated with **phenytoin dressing demonstrated significantly faster wound healing** compared to those receiving saline dressings. The average healing time was reduced by approximately **5 days**, and the difference was statistically significant (p=0.040).

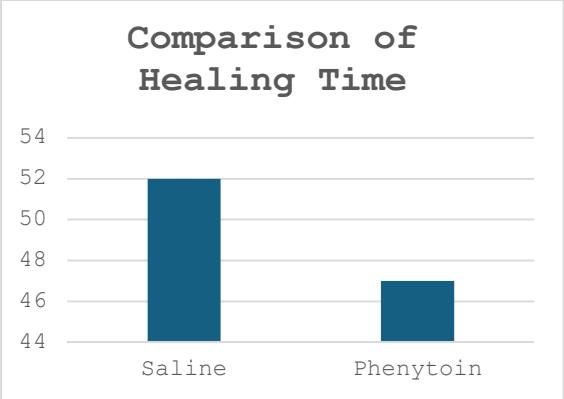

Table 4. Distribution of Healing Time

Healing Time	Saline (n=15)	Phenytoin (n=15)
<40 days	2 (13.3%)	3 (20.0%)
40–60 days	9 (60.0%)	8 (53.3%)
>60 days	4 (26.7%)	4 (26.7%)

Most patients in both groups healed within **40–60 days**. However, a larger proportion of patients in the phenytoin group achieved healing in **less than 40 days**, suggesting earlier wound recovery with phenytoin dressings.

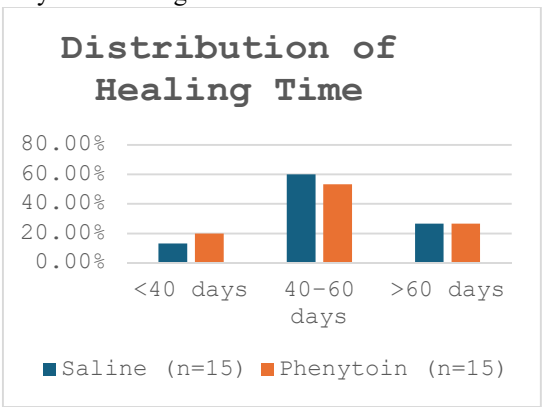

Table 5. Wound Closure Rate

Parameter	Saline	Phenytoin	p-value
Mean Wound Closure (%)	77.5 ± 9.2	81.5 ± 7.8	0.350

The phenytoin group demonstrated a higher average wound closure rate than the saline group. Although the difference favored phenytoin, it did not reach statistical significance (p=0.350).

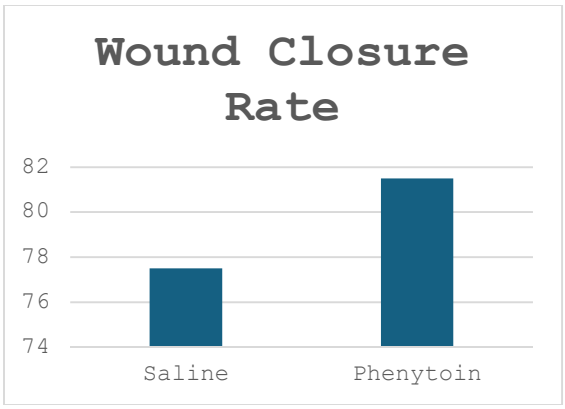

Table 6. Distribution of Wound Closure

Wound Closure	Saline (n=15)	Phenytoin (n=15)
>80%	9 (60.0%)	11 (73.3%)
60–80%	5 (33.3%)	3 (20.0%)
<60%	1 (6.7%)	1 (6.7%)

Nearly three-fourths of patients receiving phenytoin dressings achieved **greater than 80% wound closure**, compared with 60.0% in the saline group, indicating superior clinical healing with phenytoin treatment.

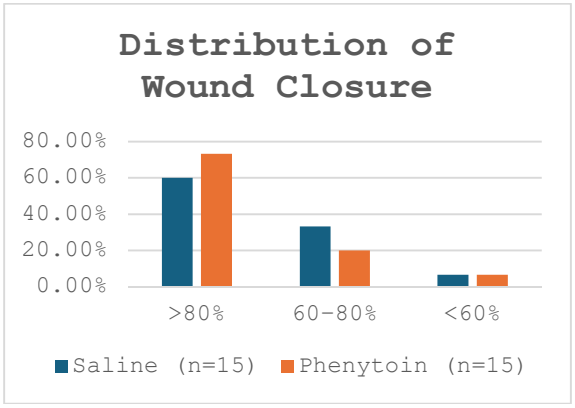

Table 7. Comparison of Complications

Complications	Saline (n=15)	Phenytoin (n=15)	p-value
Present	4 (26.7%)	2 (13.3%)	0.580
Absent	11 (73.3%)	13 (86.7%)	

Complications occurred less frequently among patients receiving phenytoin dressings (13.3%) than saline dressings (26.7%). Although the complication rate was lower with phenytoin, the difference was not statistically significant.

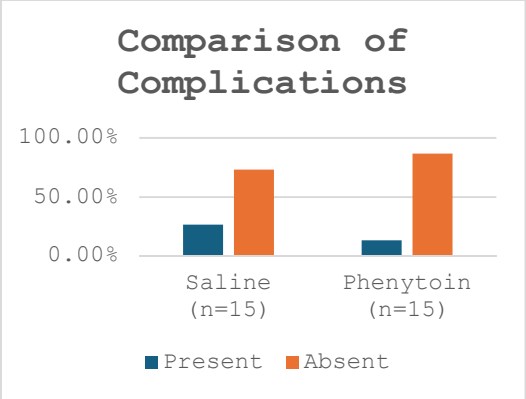

Table 8. Types of Complications

Type of Complication	Saline	Phenytoin
Infection	2 (50.0%)	1 (50.0%)
Wound Dehiscence	2 (50.0%)	1 (50.0%)
Total Complications	4	2

Among patients who developed complications, infection and wound dehiscence were the most common findings. The absolute number of complications was lower in the phenytoin group, supporting its favorable safety profile.

Table 9. Pain Score Comparison

Parameter	Saline	Phenytoin	p-value
Mean Pain Score	5.5 ± 1.3	4.5 ± 1.2	0.030*

*Significant ($p<0.05$)

Patients treated with phenytoin dressings experienced significantly lower pain scores than those receiving saline dressings (p=0.030), indicating better patient comfort during wound healing.

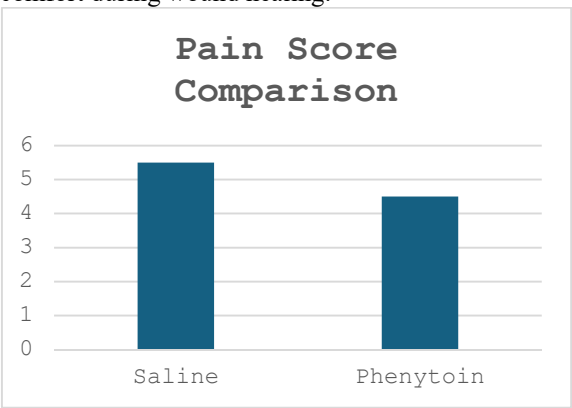

Table 10. Overall Clinical Outcome Comparison

Outcome	Saline	Phenytoin	p-value
Mean Healing Time (days)	52.0	47.0	0.040*
Mean Wound Closure (%)	77.5	81.5	0.350
Complication Rate	26.7%	13.3%	0.580
Mean Pain Score	5.5	4.5	0.030*

Overall, patients receiving **phenytoin dressings showed better clinical outcomes** than those receiving saline dressings. Phenytoin significantly reduced healing time and pain scores while demonstrating higher wound closure rates and fewer complications. Although differences in wound closure and complication rates were not statistically significant, both outcomes consistently favored phenytoin dressing, suggesting that it is a more effective dressing modality for diabetic foot ulcer management.

4. Discussion

The present comparative study evaluated the effectiveness of topical phenytoin dressing versus conventional normal saline dressing in the management of diabetic foot ulcers. Thirty patients were equally allocated into saline and phenytoin dressing groups, and outcomes including wound healing time, wound closure rate, pain score, and complications were compared. The findings demonstrated that patients treated with topical phenytoin dressing experienced superior clinical outcomes compared to those treated with conventional saline dressing. The phenytoin group showed a significantly shorter mean healing time (47 days vs. 52 days; p=0.040) and significantly lower mean pain score (4.5 vs. 5.5; p=0.030). Although wound closure rate was higher in the phenytoin group (81.5% vs. 77.5%) and complication rate was lower (13.3% vs. 26.7%), these differences were not statistically significant (p=0.350 and p=0.580, respectively). Overall, these findings indicate that topical phenytoin dressing offers a clinically beneficial alternative to saline dressing by accelerating wound healing, improving patient comfort, and reducing complications in diabetic foot ulcer management.

Healing time remains one of the most important indicators of successful diabetic foot ulcer treatment because prolonged wound healing increases the risk of infection, hospitalization, and lower limb amputation. In the present study, the mean healing time was significantly shorter in the phenytoin group (47 days) than in the saline group (52 days). Furthermore, 20.0% of patients in the phenytoin group achieved healing within 40 days compared with only 13.3% in the saline group. These findings suggest that phenytoin promotes earlier wound repair, probably through stimulation of fibroblast proliferation, enhanced collagen deposition, angiogenesis, and accelerated granulation tissue formation.

The present findings are comparable with those reported by Raju (2025), [11] demonstrated significantly faster wound healing with topical phenytoin dressing compared with saline dressing. In their randomized controlled trial involving 60 patients,

the phenytoin group showed a 66.1 ± 4.9% reduction in ulcer area compared with 35.1 ± 7.5% in the saline group ($p<0.001$). Granulation tissue appeared significantly earlier in the phenytoin group (8.8 ± 3.0 days) than in the saline group (12.9 ± 4.1 days, $p<0.001$), confirming the ability of phenytoin to accelerate wound healing. Similarly, Nagaraj (2022) [12] compared local injectable insulin, topical phenytoin, and saline dressing among 60 diabetic foot ulcer patients and reported that the mean healing time was 23 days in the phenytoin group compared with 26 days in the saline group ($p<0.001$), indicating superior healing with phenytoin although local insulin produced the fastest healing overall. These studies support the significant reduction in healing time observed in the present study.

The present study also demonstrated a higher wound closure rate in the phenytoin group (81.5%) compared with the saline group (77.5%), although the difference did not reach statistical significance ($p=0.350$). Additionally, 73.3% of patients receiving phenytoin achieved greater than 80% wound closure compared with 60.0% of patients treated with saline dressing. These findings indicate a consistent trend toward improved wound contraction and epithelialization with topical phenytoin.

Comparable findings were reported by Babu (2023) [13] in a longitudinal study involving 100 patients with chronic diabetic foot ulcers. The study demonstrated significantly greater granulation tissue formation in the phenytoin group (98.09%) compared with the saline group (95.91%; $p=0.001$). The mean granulation tissue area was also significantly higher with phenytoin (39.63 ± 2.6 cm^2) than saline (36.07 ± 5.7 cm^2; $p=0.001$). Likewise, Gunasekaran (2017) [14] reported that the rate of granulation tissue formation was 90.36% in the phenytoin group compared with 82.03% in the saline group ($p=0.0011$), indicating significantly enhanced wound bed preparation with phenytoin dressing. Although the reduction in wound surface area from 41.25 cm^2 to 18.38 cm^2 in the phenytoin group was greater than the reduction from 40.28 cm^2 to 20.23 cm^2 in the saline group, the difference was not statistically significant. These observations are in agreement with the present study, where wound closure consistently favored phenytoin despite the absence of statistical significance.

Pain relief is another important determinant of patient satisfaction and treatment compliance during wound care. In the present study, the phenytoin group demonstrated significantly lower pain scores than the saline group (4.5 vs. 5.5; $p=0.030$). Additionally, 40.0% of patients in the phenytoin group reported minimal or no pain compared with 33.3% in the saline group. Improved pain control may be attributed to the rapid development of healthy granulation tissue and reduced inflammation associated with phenytoin dressing, thereby minimizing repeated tissue trauma during dressing changes.

Although most previous studies primarily evaluated wound healing parameters rather than pain scores, their findings indirectly support better patient comfort with phenytoin through accelerated healing and healthier wound beds. Raju (2025) [11] reported earlier granulation tissue formation (8.8 ± 3.0 days) and greater bacterial clearance in the phenytoin group, both of which are likely to contribute to reduced pain during wound care. Similarly, Babu (2023) [13] observed improved granulation tissue formation and shorter hospitalization with phenytoin dressing, suggesting enhanced patient recovery and comfort. The significant reduction in pain observed in the present study therefore strengthens the clinical advantages of topical phenytoin.

Prevention of wound infection and other complications is essential for successful diabetic foot ulcer management. In the present study, complications were observed in only 13.3% of patients receiving phenytoin dressing compared with 26.7% in the saline group, although the difference was not statistically significant ($p=0.580$). Infection and wound dehiscence remained the most common complications in both groups, but fewer patients receiving phenytoin developed these adverse outcomes. The lower complication rate may be related to the antibacterial and anti-inflammatory properties of topical phenytoin, which help reduce bacterial colonization while promoting healthy tissue regeneration.

The present findings are consistent with Gunasekaran (2017), [14] demonstrated that repeat wound cultures on day 21 showed 50% negative cultures in the phenytoin group compared with only 24% in the saline group, indicating superior antibacterial activity of phenytoin. Similarly, Raju (2025) reported significantly better bacterial culture conversion by day 10 in patients receiving phenytoin (76.2%) compared with saline dressing (22.2%; $p=0.01$), confirming improved infection control with topical phenytoin. Furthermore, Vinayak (2026) [15] observed that adverse events were fewer in the phenytoin group, although the difference was not statistically significant ($p=0.431$). These findings support the lower complication rate observed in the present study.

Hospital stay represents an important clinical and economic outcome in diabetic foot ulcer treatment. Although hospital stay was not directly evaluated in the present study, the shorter healing time observed with phenytoin suggests that earlier wound recovery may reduce hospitalization requirements. Similar observations were reported by Babu (2023), [13] where the mean hospital stay was significantly shorter in the phenytoin group (27.8 ± 2.4 days) compared

with the saline group (31.3 ± 4.2 days; p=0.001). Raju (2025) [11] reported a shorter hospital stay with phenytoin (21.4 ± 3.5 days) than saline (24.1 ± 2.8 days), although the difference did not reach statistical significance (p=0.09). These findings further suggest that phenytoin may reduce healthcare utilization through faster wound healing.

However, not all published evidence has demonstrated superiority of topical phenytoin. Vinayak (2026) [15] reported contrasting findings in a randomized open-label trial involving 28 patients. Complete healing occurred in 23% of the phenytoin group compared with 53% of the saline group (p=0.102), while ulcer size reduction was significantly greater with saline (89.19 ± 17.33%) than with phenytoin (56.51 ± 46.11%; p=0.037). Median healing time remained 8 weeks in both groups (p=0.142). Nevertheless, phenytoin was associated with fewer adverse events. These contrasting findings may be explained by the relatively small sample size, differences in ulcer grading, treatment protocols, patient characteristics, and duration of follow-up. Therefore, although the present study and several previous investigations favor phenytoin dressing, further large multicenter randomized trials remain necessary to establish definitive clinical recommendations. The findings of the present study are largely consistent with the majority of published literature demonstrating that topical phenytoin dressing improves wound healing outcomes compared with conventional saline dressing. Significant reductions in healing time and pain, together with higher wound closure rates and fewer complications, suggest that phenytoin provides important therapeutic advantages in diabetic foot ulcer management. Although some studies have reported conflicting results, the overall body of evidence indicates that topical phenytoin is a safe, inexpensive, and effective adjunctive dressing that enhances granulation tissue formation, promotes faster healing, improves bacterial clearance, and may reduce treatment-related morbidity in patients with diabetic foot ulcers.

Conclusion

The present study demonstrated that topical phenytoin dressing is a more effective treatment modality than conventional saline dressing for the management of diabetic foot ulcers. Patients treated with phenytoin experienced significantly faster wound healing and lower pain scores, along with higher wound closure rates and fewer complications compared to those receiving saline dressings. Although the differences in wound closure rate and complication rate were not statistically significant, the overall clinical outcomes consistently favored phenytoin. These findings suggest that topical phenytoin is a safe, economical, and clinically beneficial dressing option that enhances wound healing and improves patient comfort. Therefore, topical phenytoin dressing may be considered an effective adjunct in the management of diabetic foot ulcers, while larger multicenter studies with longer follow-up are recommended to further validate its long-term efficacy and safety.

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