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Case Study: Topical *Tribee* Ointment Application with Moist Dressings in a Postoperative Diabetic Foot Ulcer Amputation Patient

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ABSTRACT

Diabetic foot ulcers are one of the most common and severe complications in patients with Diabetes Mellitus, often resulting in infections and amputations. Optimal wound care is crucial to accelerate healing and prevent further complications. a herbal ointment containing tea tree oil (Melaleuca alternifolia), vitamin E, and honey, has demonstrated antimicrobial, anti-inflammatory, and wound-healing properties. This case study aims to evaluate the effectiveness of topical Tribee ointment application using moist dressings in promoting wound healing in a postoperative diabetic ulcer amputation patient with a high risk of infection. This case study applied a nursing care process including assessment, diagnosis, intervention, implementation, and evaluation over four sessions with two-day intervals at the patient's home. The nursing diagnosis was established using the Indonesian Nursing Diagnosis Standards (SDKI), with interventions guided by the Indonesian Nursing Intervention Standards (SIKI), and outcomes assessed through the Indonesian Nursing Outcome Standards (SLKI). The SOAPIER format was used for documentation. The patient was diagnosed with a high risk of infection (D.0142) related to post-amputation wounds. After receiving wound care with topical Tribee ointment and moist dressings for four sessions (30 minutes each), the patient's wound condition improved significantly, as measured by the Bates-Jensen Wound Status Continuum, with a score decrease from 35 to 28. Topical Tribee ointment combined with moist dressings is effective in enhancing wound healing in patients with diabetic foot ulcers, particularly those at high risk of infection.

INTRODUCTION

Diabetes Mellitus (DM), commonly known as diabetes, is a chronic metabolic disorder with a high global and national prevalence. In 2014, the global number of people living with DM was estimated at 422 million (Reza, 2022). This number continues to increase annually due to sedentary lifestyles and changes in dietary patterns. The growing prevalence of DM, especially in developing countries experiencing economic growth, has raised global concern (Khasanah, 2020).

Poorly managed diabetes can lead to a range of complications, one of the most serious being diabetic foot ulcers. These ulcers are increasing in prevalence worldwide (Nabilla, 2018). Global data show that the prevalence of diabetic foot ulcers is highest in North America (13%), followed by Africa (7.2%), Asia (5.5%), Europe (5.1%), and Oceania (3.0%). Diabetic foot ulcers are more frequently observed in males and patients with type 2 diabetes compared to type 1 (Sari, 2019).

In Indonesia, the prevalence of diabetic ulcers is approximately 15%, with an amputation rate of 30% and a mortality rate of 14.8% within one year after amputation. This is supported by data showing an 11% increase in diabetic ulcer cases (Susanto, 2022). According to the North Sumatra Provincial Health Office, from January to October 2016, 16,482 cases of DM were reported. Among these, 9,921 were type II, 6,475 were type I, and 86 were gestational diabetes cases. In 2017, the number increased to 160,913 cases, with diabetic foot ulcers affecting about 15% of all DM patients (Wijaya & Kep, 2018).

Diabetic foot ulcers are characterized by infection, ulceration, or destruction of deep tissues associated with neuropathy and peripheral arterial disease (PAD) in DM patients (Hardiyanti & Dirdjo, 2015). These ulcers are among the most feared complications due to prolonged healing times, high treatment costs, and a growing number of amputations (Vedia, 2022).

Optimal wound care is crucial for managing diabetic foot ulcers, particularly through the maintenance of a moist wound environment to facilitate tissue regeneration (Alfin, 2021). One emerging approach involves the use of herbal topical ointments such as Tribee, which contains tea tree oil, vitamin E, and honey. Tea tree oil is known for its antiseptic, antibacterial, anti-inflammatory, and antiviral properties (Kaeng & Haryanto, 2022). Honey has wound-covering, antibacterial, and tissue-regenerating functions (Prima, Putra, & Yusrini, 2022), while vitamin E supports skin regeneration and moisture retention.

In addition to pharmacological approaches, non-pharmacological treatments such as the use of herbal Tribee ointment have been shown to support wound healing in DM patients. According to Professor Jennifer Eddy from the University of Wisconsin School of Medicine and Public Health, honey's acidic nature can kill bacteria and reduce the risk of antibiotic resistance. Natural honey contains catalase enzymes, which act as antibacterial agents, and its low water content (<18%) allows it to absorb exudate from the wound (Prima et al., 2022).

Moreover, 0.9% sodium chloride (NaCl) solution is commonly used in hospitals for wound care. It is applied using sterile gauze moistened with NaCl solution, followed by the application of honey and a secondary dressing also moistened with

NaCl to maintain moisture (Maria Allen, 2022).

Several studies have reported that Tribee, which contains honey is highly effective as a topical wound therapy, significantly increasing granulation tissue formation, collagen production, and epithelialization. Honey is rich in carbohydrates, calcium, iron, sodium, and contains natural compounds like methylglyoxal (MGO)—particularly in Manuka honey—which has strong antibacterial and anti-inflammatory properties. It also contains folic acid, antioxidants, and peptides that promote skin regeneration. With a low pH (3.9–4.5) and high sugar concentration (70–80%), honey inhibits bacterial growth without damaging tissues and provides nutrition to immune cells at the wound site (Sihombing, 2021).

Based on this background, the authors were motivated to apply topical Tribee ointment interventions using moist dressings to support the healing of diabetic wounds. This study aimed to examine the effectiveness of wound care interventions using topical Tribee ointment and moist dressings in enhancing the wound healing process among diabetic ulcer patients at high risk of infection

METHOD

Assesment

The research design used in this study was a case study with a nursing care approach, involving data collection through assessment, nursing diagnosis formulation, planning, implementation, and comprehensive evaluation. This case study utilized a descriptive qualitative method, aiming to explore the patient's condition in depth and provide an overview of nursing care interventions using topical Tribee ointment and moist dressings to support the postoperative recovery process in a patient with a diabetic foot ulcer following amputation.

Wound care procedures included the removal of existing dressings followed by wound cleansing, which served as the initial step prior to wound assessment. Wound cleansing is a critical component of wound management, as it helps eliminate microorganisms, foreign materials, and necrotic tissue. Proper wound cleansing also facilitates accurate wound assessment, enabling nurses to determine the appropriate wound care goals and select suitable dressing types. When performed correctly, this step can reduce wound care time and accelerate the healing process.

The implementation and evaluation of the nursing care plan were conducted over four sessions, starting from June 9 to June 16, 2024, at the patient's home located at Singaparna, Tasikmalaya, West Java. The nursing diagnoses were formulated in accordance with the Indonesian Nursing Diagnosis Standards (SDKI), and interventions were guided by the Indonesian Nursing Intervention Standards (SIKI), focusing on the use of topical Tribee ointment and moist dressings. Outcomes were measured based on the Indonesian Nursing Outcome Standards (SLKI), and nursing documentation was recorded using the SOAPIER format.

To evaluate the wound condition, the Wagner Grade system was used to assess the wound's status before and after each wound care session. Additionally, the Bates-Jensen Wound Status Continuum was utilized to quantify wound healing progress. In this scoring system, a higher

score indicates a more severe wound condition, while a lower score reflects wound improvement. This method provided a clear and measurable overview of wound progression in the patient.

RESULTS AND DISCUSSION

This case study was conducted on Mr. I, a 50-year-old male diagnosed with diabetic foot ulcer who resides Singaparna, Tasikmalaya, West Java. The patient presented with an open wound following a surgical amputation, accompanied by purulent discharge.

Image 1. wounds before homecare treatment

Based on the assessment conducted on June 8, 2024, Mr. I underwent an amputation on May 29, 2024, due to a gangrenous diabetic ulcer affecting three toes on his right foot. He was discharged from the hospital on June 1, 2023, to continue home care. At the time of the evaluation, the patient reported persistent pain at the amputation site, described as a stabbing sensation, particularly at night (pain scale: 4/10), which subsided in the morning. Clinical findings included purulent exudate, feverish sensations, a random blood glucose level of 210 mg/dL, and a body temperature of 38.0°C. The patient stated that fever generally occurred before wound care and subsided afterward. He also had a history of diabetes mellitus diagnosed one year prior.

Physical Examination

Mr. I was alert and oriented, with a Glasgow Coma Scale (GCS) score of E4V5M6. Both upper extremities appeared symmetrical and free of wounds or deformities. The right foot had undergone surgical amputation involving the great toe, second, and third toes due to gangrene. The left foot was intact and showed no signs of lesions or tenderness. Muscle strength was decreased in the remaining right lower extremity, though the patient could still perform daily activities independently, with some assistance required for position changes. Examination of the integumentary system revealed a 5 cm wound at the amputation site, characterized by a pale red wound bed, slough tissue, slight bleeding, and purulent exudate. Skin turgor remained within normal limits.

Table 1. Blood Glucose Monitoring

Date	Blood Glucose (mg/dL)	Reference Range
June 1, 2023	419	<140
June 8, 2023	205	<140
June 10, 2023	190	<140
June 12, 2023	160	<140
June 14, 2023	150	<140

The patient was undergoing insulin therapy at a dosage of 12 units, three times daily before meals, administered via subcutaneous injection.

Nursing Diagnosis

Based on the subjective and objective findings, the nursing diagnosis was determined as Risk of Infection (D.0142) associated with postoperative gangrenous ulcer amputation, characterized by:

- Subjective:
    1. Patient reports fever.
    2. Patient reports purulent discharge when dressing is changed.
- Objective:
    1. Body temperature: 38.0°C.
    2. Generalized fatigue.
    3. Presence of pus in the wound.
    4. Pale red wound surface with slough and blood.
    5. Wound classified as stage 3 with a granulation score of 35.

Table 2. Nursing Interventions

Nursing Diagnosis	Interventions	Rationale
Risk of infection due to gangrenous ulcer post-amputation	**Observation:** 1. Monitor wound characteristics. 2. Monitor for signs of infection. **Therapeutic:** 1. Gently remove dressing. 2. Clean wound with saline. 3. Debride necrotic tissue. 4. Apply topical Tribee ointment. 5. Dress wound appropriately. 6. Maintain aseptic technique. 7. Reposition every 2 hours or as needed. **Education:** Advise high-protein and high-calorie diet.	**Observation:** To assess wound progression and signs of infection. **Therapeutic:** To maintain a clean, moist wound environment and reduce infection risk. **Education:** To promote wound healing through adequate nutrition.

Implementation

Nursing care was implemented according to the identified diagnosis and tailored to the patient's needs. The patient's family was actively involved to support independent care at home. By the second visit, clinical improvements were observed, including the absence of pus, prompting continued wound care and reassessment at subsequent visits.

Evaluation

Over the course of four clinical visits, significant improvements in the wound condition were documented:

- **1st Visit:** Pus present, pale red wound bed, 75% slough tissue, bleeding, wound score: 35 (Stage 3).
- **2nd Visit:** No pus, reduced slough, less bleeding, score: 33 (Stage 3).

Image 1. Apply topical Tribee ointment

- **3rd Visit:** Bright red wound bed, minimal slough, no bleeding, score: 30 (Stage 3).
- **4th Visit:** Further healing, improved granulation, reduced score to 28 (Stage 3), indicating marked improvement per Bates-Jensen Wound Assessment Tool (max score: 60).

Discussion

This study highlights the postoperative wound management of a patient with a diabetic foot ulcer complicated by gangrene. The patient's clinical presentation, including purulent discharge, fever, slough tissue, and elevated blood glucose, was consistent with an active infection. Surgical amputation was a necessary intervention to prevent further tissue damage (Prabowo, 2018; Oktalia et al., 2021). Postoperative care focused on preventing infection, which is a known risk due to impaired wound healing in diabetic patients (Arifin & Kurnia, 2022; Suparyanto & Rosad, 2020).

In this case, moist wound healing with Tribee ointment dressing was utilized. Honey's antimicrobial and bioactive properties support granulation and tissue regeneration. Improvements observed over four visits—including decreased slough, reduced wound size, and improved wound bed color—demonstrate the effectiveness of this method. These findings align with previous studies (Fauzi, 2022; Kristianto, 2010; Kaeng & Haryanto, 2022; Alfin, 2021), affirming that herbal Tribee ointment wound care can significantly enhance healing in diabetic patients.

CONCLUSIONS

The provision of wound care interventions using herbal Tribee ointment and moist dressings has been shown to accelerate the wound healing process in patients with diabetic foot ulcers. This is evidenced by a decrease in the wound assessment score from 35 to 28, based on the Bates-Jensen Wound Assessment Tool (maximum score: 60), where a lower score indicates better wound healing. These results suggest that the use of herbal Tribee ointment as part of moist wound therapy can significantly improve wound conditions in post-amputation diabetic patients.

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